

As filed with the Securities and Exchange Commission on March 17, 2023

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

Form 20-F

☐ REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES
EXCHANGE ACT OF 1934

or

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE
ACT OF 1934 FOR THE FISCAL YEAR ENDED December 31, 2022

or

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934

or

☐ SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934

Date of event requiring this shell company report.....

Commission file number 1-15242

Deutsche Bank Aktiengesellschaft

(Exact name of Registrant as specified in its charter)

Deutsche Bank Corporation

(Translation of Registrant's name into English)

Federal Republic of Germany

(Jurisdiction of incorporation or organization)

Taunusanlage 12, 60325 Frankfurt am Main, Germany(DE)

(Address of principal executive offices)

Andrea Schriber, +49-69-910-40493, andrea.schriber@db.com, Taunusanlage 12, 60325 Frankfurt am Main, Germany (DE)

(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

Securities registered or to be registered pursuant to Section 12(b) of the Act
See following page

Securities registered or to be registered pursuant to Section 12(g) of the Act.

NONE

(Title of Class)

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act.

NONE

(Title of Class)

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report:

Ordinary Shares, no par value

2,037,841,513

(as of December 31, 2022)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes ☒

No ☐

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

Yes ☐

No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes ☒

No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes ☒

No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of "large accelerated filer", "accelerated filer", and emerging growth company in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer ☒ Accelerated filer ☐

Non-accelerated filer ☐ Emerging growth company ☐

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards* provided pursuant to Section 13(a) of the Exchange Act. ☐

*The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP ☐

International Financial Reporting Standards ☒

Other ☐

as issued by the International Accounting Standards Board

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow

Item 17 ☐

Item 18 ☐

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes ☐

No ☒

(APPLICABLE ONLY TO ISSUERS INVOLVED IN BANKRUPTCY PROCEEDINGS DURING THE PAST FIVE YEARS)

Indicate by check mark whether the registrant has filed all documents and reports required to be filed by Sections 12, 13 or 15(d) of the Securities Exchange Act of 1934 subsequent to the distribution of securities under a plan confirmed by a court.

Yes ☐

No ☐

Securities registered or to be registered pursuant to Section 12(b) of the Act (as of February 28, 2023)

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Ordinary shares, no par value	DB	The New York Stock Exchange
Fixed to Fixed Reset Rate Subordinated Tier 2 Notes Due 2028	DB /28	The New York Stock Exchange
4.50 % Fixed Rate Subordinated Tier 2 Notes Due 2025	DB 25	The New York Stock Exchange
DB Gold Double Long Exchange Traded Notes due February 15, 2038	DGP	NYSE Arca, Inc.
DB Gold Double Short Exchange Traded Notes due February 15, 2038	DZZ	NYSE Arca, Inc.
DB Gold Short Exchange Traded Notes due February 15, 2038	DGZ	NYSE Arca, Inc.

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Deutsche Bank Aktiengesellschaft, also called Deutsche Bank AG, is a stock corporation organized under the laws of the Federal Republic of Germany. Unless otherwise specified or required by the context, in this document, references to “the Group”, “the bank”, “the company”, “the firm”, “Deutsche Bank” and “Deutsche Bank Group” are to Deutsche Bank Aktiengesellschaft and its consolidated subsidiaries.

Due to rounding, numbers presented throughout this document may not add up precisely to the totals the bank provides and percentages may not precisely reflect the absolute figures.

The bank’s registered address is Taunusanlage 12, 60325 Frankfurt am Main, Germany, and its telephone number is +49-69-910-00.

Inclusion of the Annual Report

The Group has included as an integral part of this Annual Report on Form 20-F its Annual Report 2022, to which it refers to the responses to certain items hereof. Certain portions of the Annual Report 2022 have been omitted, as indicated therein. The included Annual Report 2022 contains the Consolidated Financial Statements, which the bank refers to in response to Items 8 and 18.

The Annual Report 2022 and Consolidated Financial Statements included herein differ from those Deutsche Bank publishes for other purposes (the “non-SEC” versions thereof) in that the financial information presented in the Annual Report 2022 and Consolidated Financial Statements included herein has been prepared in accordance with International Financial Reporting Standards (“IFRS”) as issued by the International Accounting Standards Board (“IASB”). The financial information presented in the non-SEC Annual Report 2022 and Consolidated Financial Statements included therein, by contrast, has been prepared in accordance with IFRS as issued by the IASB and endorsed by the European Union (EU), including, the application of fair value hedge accounting for portfolio hedges of interest rate risk (fair value macro hedges) in accordance with the EU carve-out version of IAS 39. For further information, see Note 1, “Significant accounting policies and critical accounting estimates – Basis of accounting – EU carve-out” to the Consolidated Financial Statements.

Such Consolidated Financial Statements differ from those contained in the Annual Report 2022 used for other purposes (the “non-SEC financial statements”) in that (i) Notes 42, 43 and 44 of the non-SEC financial statements, which address non-U.S. requirements, have been deleted, (ii) Notes 45 and 46 of the non-SEC financial statements are set forth as Notes 42 and 43, respectively, of the included financial statements, and (iii) Note 44, which addresses U.S. requirements, has been added to the included financial statements.

The Consolidated Financial Statements have been audited by Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, as described in their “Report of Independent Registered Public Accounting Firm” included in the Annual Report 2022. Such report is included only in the version of the Annual Report 2022 included in this Annual Report on Form 20-F.

Cautionary Statement Regarding Forward-Looking Statements

Deutsche Bank makes certain forward-looking statements in this document with respect to its financial condition and results of operations. In this document, forward-looking statements include, among others, statements relating to:

- The potential development and impact on the bank of economic and business conditions and the legal and regulatory environment to which the bank is subject, including the significant challenges that may arise from persistent inflationary pressures and rising interest rates, the continuing war in Ukraine, a deteriorating macroeconomic environment, and elevated geopolitical risks;
- Its ability to sustain its improved profitability resulting from the bank’s transformation, its strategic initiatives and its responses to economic and business conditions and the legal and regulatory environment;
- The development of aspects of its results of operations;
- The bank’s expectations of the impact of risks that affect its business, including the risks of losses on its trading processes and credit exposures;
- Other statements relating to its future business development and economic performance.

In addition, the Group may from time to time make forward-looking statements in its periodic reports to the United States Securities and Exchange Commission on Form 6-K, annual and interim reports, invitations to Annual General Meetings and other information sent to shareholders, offering circulars and prospectuses, press releases and other written materials. Its Management Board, Supervisory Board, officers and employees may also make oral forward-looking statements to third parties, including financial analysts.

Forward-looking statements are statements that are not historical facts, including statements about its beliefs and expectations. The bank uses words such as “believe”, “anticipate”, “expect”, “intend”, “seek”, “estimate”, “project”, “should”, “potential”, “reasonably possible”, “plan”, “aim” and similar expressions to identify forward-looking statements.

By their very nature, forward-looking statements involve risks and uncertainties, both general and specific. Deutsche Bank bases these statements on its current plans, estimates, projections and expectations. The reader of this document should therefore not place too much reliance on them. Its forward-looking statements speak only as of the date the bank makes them, and the bank undertakes no obligation to update any of them in light of new information or future events.

The Group cautions the reader that a number of important factors could cause its actual results to differ materially from those the bank describes in any forward-looking statement. These factors include, among others, the following:

- The potential development and impact on the bank of economic and business conditions and the legal and regulatory environment to which the bank is subject, including the significant challenges that may arise from persistent inflationary pressures and rising interest rates, the continuing war in Ukraine, a deteriorating macroeconomic environment, and elevated geopolitical risks;
- Its ability to sustain its improved profitability resulting from the bank's transformation, its strategic initiatives and its responses to economic and business conditions and the legal and regulatory environment;
- Other changes in general economic and business conditions;
- Changes and volatility in currency exchange rates, interest rates and asset prices;
- Changes in governmental policy and regulation, including measures taken in response to economic, business, political and social conditions;
- The potential development and impact on the bank of legal and regulatory proceedings to which the bank is or may become subject;
- Changes in its competitive environment;
- The success of its acquisitions, divestitures, mergers and strategic alliances; and
- Other factors, including those the Group refers to in “Item 3: Key Information – Risk Factors” and elsewhere in this document and others to which the bank does not refer.

Use of Non-GAAP Financial Measures

This document and other documents the Group has published or may publish contain non-GAAP financial measures. Non-GAAP financial measures are measures of its historical or future performance, financial position or cash flows that contain adjustments that exclude or include amounts that are included or excluded, as the case may be, from the most directly comparable measure calculated and presented in accordance with IFRS in its financial statements. Examples of its non-GAAP financial measures, and the most directly comparable IFRS financial measures, are as follows:

Non-GAAP Financial Measure	Most Directly Comparable IFRS Financial Measure
Adjusted profit (loss) before tax, Adjusted profit (loss) before tax ex BGH ruling on pricing agreements	Profit (loss) before tax
Profit (loss) attributable to Deutsche Bank shareholders for the segments, Profit (loss) attributable to Deutsche Bank shareholders after AT1 coupon for the segments, Adjusted profit (loss) attributable to Deutsche Bank shareholders, Adjusted profit (loss) ex BGH ruling on pricing agreements, Adjusted Profit (loss) attributable to Deutsche Bank shareholders ex BGH ruling on pricing agreements	Profit (loss)
Revenues excluding specific items, Revenues on a currency-adjusted basis, Revenues adjusted for forgone revenues due to BGH ruling	Net revenues
Adjusted costs, Adjusted costs excluding transformation charges, Adjusted costs excluding transformation charges and bank levies, Adjusted costs excluding transformation charges and expenses eligible for reimbursement related to Prime Finance	Noninterest expenses
Net assets (adjusted)	Total assets
Tangible shareholders' equity, Average tangible shareholders' equity, Tangible book value, Average tangible book value	Total shareholders' equity (book value)
Post-tax return on average shareholders' equity (based on Profit (loss) attributable to Deutsche Bank shareholders after AT 1 coupon), Post-tax return on average tangible shareholders' equity, Adjusted post-tax return on average tangible shareholders' equity, Adjusted post-tax return on average tangible shareholders' equity ex-BGH ruling	Post-tax return on total shareholders' equity
Tangible book value per basic share outstanding, Book value per basic share outstanding	Book value per share outstanding

For descriptions of these non-GAAP financial measures and the adjustments made to the most directly comparable financial measures under IFRS, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures", which is included herein.

When used with respect to future periods, non-GAAP financial measures used by Deutsche Bank are also forward-looking statements. The bank cannot predict or quantify the levels of the most directly comparable financial measures under IFRS that would correspond to these measures for future periods. This is because neither the magnitude of such IFRS financial measures, nor the magnitude of the adjustments to be used to calculate the related non-GAAP financial measures from such IFRS financial measures, can be predicted. Such adjustments, if any, will relate to specific, currently unknown, events and in most cases can be positive or negative, so that it is not possible to predict whether, for a future period, the non-GAAP financial measure will be greater than or less than the related IFRS financial measure.

Regulatory fully loaded measures

The Group's regulatory assets, exposures, risk-weighted assets, capital and ratios are calculated for regulatory purposes and are set forth throughout this document under the Capital Requirement Regulation (CRR)/ Capital Requirement Directive (CRD) as currently applicable.

For the comparatives as of December 31, 2021 certain figures are based on the CRR definition of own fund instruments (applicable for Additional Tier 1 (AT1) capital and Tier 2 capital and figures based thereon, including Tier 1, Total Capital and Leverage Ratio) are presented on a "fully loaded" basis. Such fully loaded figures are calculated excluding the transitional arrangements for own fund instruments as provided in the currently applicable CRR/CRD. Deutsche Bank had immaterial amounts of such instruments outstanding at year end 2022. For those comparatives periods the CET 1 and risk weighted asset (RWA) figures include the transitional impacts from the IFRS 9 add-back also in the fully-loaded figures given it is an immaterial difference. Measures calculated pursuant to the Group's fully loaded methodology are non-GAAP financial measures.

Deutsche Bank believes that these fully loaded calculations provided useful information to investors as they reflected the bank's progress against then known future regulatory capital standards. Many of Deutsche Bank's competitors have been describing calculations on a fully loaded basis, however, competitors' assumptions and estimates regarding fully loaded calculations may have varied such that the bank's fully loaded measures may not have been comparable with similarly labelled measures used by its competitors.

For descriptions of these fully loaded CRR/CRD measures and the differences from the most directly comparable measures under the CRR/CRD transitional rules, please refer to the following sections of the Annual Report 2022, each of which is included herein: (i) "Management Report: Risk Report: Risk and capital performance: Capital, Leverage Ratio, TLAC and MREL", in particular the subsections thereof entitled "Development of Own Funds" and "Leverage Ratio", and (ii) "Supplementary Information (Unaudited): Non-GAAP Financial Measures: CRR/CRD Regulatory measures".

Use of Internet Addresses

This document contains inactive textual addresses of Internet websites operated by the bank and third parties. Reference to such websites is made for informational purposes only, and information found at such websites is not incorporated by reference into this document.

PART I

Item 1: Identity of Directors, Senior Management and Advisers

Not required because this document is filed as an Annual Report.

Item 2: Offer Statistics and Expected Timetable

Not required because this document is filed as an Annual Report.

Item 3: Key Information

Dividends

The following table shows the dividend per share in euro and in U.S. dollars for the years ended December 31, 2022, 2021, 2020, 2019 and 2018. Deutsche Bank declares dividends at its Annual General Meeting following each year. For 2022, the Management Board will propose to the Annual General Meeting to pay a dividend of € 0.30 per share. Deutsche Bank's dividends are based on the non-consolidated results of Deutsche Bank AG as prepared in accordance with German accounting principles. Because the Group declares dividends in euro, the amount an investor actually receives in any other currency depends on the exchange rate between euro and that currency at the time the euros are converted into that currency.

In general, the German withholding tax applicable to dividends is 26.375 % (consisting of a 25 % withholding tax and an effective 1.375 % surcharge). Under the German Investment Tax Act, dividends received by an investment fund within the meaning of the German Investment Tax Act are subject to 15 % German withholding tax equal to the Treaty tax rate. For individual German tax residents, the withholding tax paid represents for private dividends, generally, the full and final income tax applicable to the dividends. Dividend recipients who are tax residents of countries that have entered into a convention for avoiding double taxation may be eligible to receive a refund from the German tax authorities for a portion of the amount withheld and in addition may be entitled to receive a tax credit for the German withholding tax not refunded in accordance with their local tax law.

Generally, U.S. residents will be entitled to receive a refund equal to 11.375 % of the dividends paid. For U.S. federal income tax purposes, the dividends the Group pays are not eligible for the dividends received deduction generally allowed for dividends received by US corporations from other U.S. corporations.

Dividends in the table below are presented before German withholding tax.

See "Item 10: Additional Information – Taxation" for more information on the tax treatment of the bank's dividends.

	Dividends per share ¹	Dividends per share	Payout ratio ^{2,3}	
			Basic earnings per share	Diluted earnings per share
2022 (proposed)	\$ 0.32	€ 0.30	13%	13%
2021	\$ 0.23	€ 0.20	20%	21%
2020	\$ 0.00	€ 0.00	N/M	N/M
2019	\$ 0.00	€ 0.00	N/M	N/M
2018	\$ 0.13	€ 0.11	N/M	N/M

N/M – Not meaningful

¹ For convenience, the Group presents dividends in U.S. dollars for each year by translating the euro amounts at the period end rate for the last business day of each year.

² Deutsche Bank defines its payout ratio as the dividends the Group paid per share in respect of each year as a percentage of basic and diluted earnings per share for that year.

³ For 2019, there was no dilutive effect as the Group reported a net loss attributable to shareholders and no dilutive effect for 2018 as net income was offset by AT1 coupons paid.

Capitalization and Indebtedness

Consolidated capitalization in accordance with IFRS as issued by the IASB as of December 31, 2022

	in € m.
Debt: ^{1,2}	
Long-term debt	131,525
Trust preferred securities	500
Long-term debt at fair value through profit or loss	5,250
Total debt	137,275
Shareholders' equity:	
Common shares (no par value)	5,291
Additional paid-in capital	40,513
Retained earnings	17,769
Common shares in treasury, at cost	(331)
Accumulated other comprehensive income, net of tax	
Unrealized net gains (losses) on financial assets at fair value through other comprehensive income, net of tax and other	(1,143)
Unrealized net gains (losses) on derivatives hedging variability of cash flows, net of tax	(570)
Unrealized net gains (losses) on assets classified as held for sale, net of tax	0
Unrealized net gains (losses) attributable to change in own credit risk of financial liabilities designated at fair value through profit and loss, net of tax	62
Foreign currency translation, net of tax	172
Unrealized net gains (losses) from equity method investments	10
Total shareholders' equity	61,772
Equity component of financial instruments	8,578
Noncontrolling interests	1,791
Total equity	72,141
Total capitalization	209,415

¹ € 16 million (0.01 %) of Deutsche Bank's debt was guaranteed by the German government as of December 31, 2022, related to legacy positions assumed in the context of the Postbank takeover.

² € 62,502 million (46 %) of Deutsche Bank's debt was secured as of December 31, 2022.

Reasons for the Offer and Use of Proceeds

Not required because this document is filed as an Annual Report.

Risk Factors

An investment in Deutsche Bank's securities involves a number of risks. Potential investors should carefully consider the following information about the risks Deutsche Bank faces, together with other information in this document, when they make investment decisions involving Deutsche Bank's securities. If one or more of these risks were to materialize, it could have a material adverse effect on Deutsche Bank's financial condition, results of operations, cash flows or prices of its securities.

Summary of Risk Factors

Risks Relating to the Macroeconomic, Geopolitical and Market Environment. As a global corporate and investment bank with a large private client franchise, Deutsche Bank is materially affected by global macroeconomic and financial market conditions. Significant challenges may arise from persistent inflationary pressures and rising interest rates, the continuing war in Ukraine, a deteriorating macroeconomic environment, elevated geopolitical risks, the ongoing headwinds posed by regulatory reforms and the effects on the bank's legal and regulatory proceedings. Other risks exist with respect to China and from political and economic instability in key markets. These risks could negatively affect the business environment, leading to weaker economic activity and a broader correction in the financial markets. Materialization of these risks could negatively affect the results of operations in some of the bank's businesses and its financial condition as well as its strategic plans. Deutsche Bank's ability to protect itself against these risks is limited.

Risks Relating to Deutsche Bank's Business and Strategy. Deutsche Bank's results of operation and financial condition have in the past been negatively impacted by the market environment, uncertain macroeconomic and geopolitical conditions, lower levels of client activity, increased competition and regulation, along with tightening labor market conditions. If the bank is unable to sustain its improved profitability resulting from its transformation, it may be unable to meet its 2025 targets, and may have difficulty maintaining capital, liquidity and leverage at levels expected by market participants and its regulators. Adverse market conditions, asset price deteriorations, volatility and cautious investor sentiment have affected and may in the future materially and adversely affect Deutsche Bank's revenues and profits, particularly in its investment banking, brokerage and other commission and fee-based businesses. Intense competition, in Deutsche Bank's home market of Germany as well as in international markets, has had and could in the future have a material adverse impact on its revenues and profitability.

Deutsche Bank's liquidity, business activities and profitability may be adversely affected by an inability to access the debt capital markets or to sell assets during periods of market-wide or firm-specific liquidity constraints. Credit rating downgrades have contributed to increases in its funding costs in the past, and any future downgrade could materially adversely affect its funding costs and the willingness of counterparties to continue to do business with the bank and significantly impact aspects of its business model.

If Deutsche Bank is unable to meet its 2025 financial targets or incurs future losses, including further impairments and provisions, or low profitability, its financial condition, results of operations and share price may be materially and adversely affected, and it may be unable to make contemplated distributions of profits to its shareholders or carry out share buybacks.

Risks Relating to Regulation and Supervision. Regulatory reforms enacted and proposed in response to weaknesses in the financial sector and, more recently, to the envisaged transition towards a sustainable economy, together with increased regulatory scrutiny more generally, have had and continue to have a significant impact on the bank and may adversely affect its business and ability to execute its strategic plans. Competent regulators may prohibit the bank from making dividend payments, share repurchases or payments on its regulatory capital instruments or take other actions if the Group fails to comply with regulatory requirements. Regulatory changes may impact how key entities are funded which could affect how businesses operate and negatively impact results. Regulatory actions may also require the Group to change its business model or result in some business activities becoming unviable. Regulatory and legislative changes require the Group to maintain increased capital and debt that can be bailed in in a resolution scenario and abide by tightened liquidity requirements. Any perceptions in the market that the bank may be unable to meet its capital or liquidity requirements could intensify the effect of these factors on its business and results. Other regulatory reforms adopted or proposed may materially increase the Group's operating costs and negatively impact its business model.

Risks Relating to environmental, social and governance (ESG)-related changes. The impacts of rising global temperatures, and the enhanced focus on climate change and the transition to a "net-zero" economy from society, regulators and the banking sector, have led to new sources of financial and non-financial risks. Financial institutions are facing increased scrutiny as well as regulatory reporting requirements on climate and broader ESG-related issues from governments, regulators, shareholders and other bodies, leading to reputational risk if the bank is not seen to support ESG objectives and the risk that the Group's ESG disclosures do not adhere to evolving standards.

Risks Relating to Deutsche Bank's Internal Control Environment. The bank has identified the need to strengthen its internal control environment and infrastructure and has embarked on initiatives to accomplish this. The German Federal Financial Supervisory Authority (*Bundesanstalt für Finanzdienstleistungsaufsicht*, BaFin) has ordered the bank to improve its control and compliance infrastructure relating to anti-money laundering and know-your-client processes, and appointed a special representative to monitor these measures' implementation. In addition, the bank is engaged in ongoing regulatory discussions to resolve matters concerning adherence to prior orders and settlements related to sanctions and embargoes and AML compliance, and remedial agreements and obligations related to risk management issues. If the bank is unable to significantly improve its infrastructure and control environment on the timelines set or expected by regulators, its reputation, regulatory position and financial condition may be materially adversely affected.

Risks Relating to Litigation, Regulatory Enforcement Matters, Investigations and Tax Examinations. The bank operates in a highly regulated and litigious environment, potentially exposing it to liabilities and other costs, the amounts of which may be substantial and difficult to estimate, as well as to legal and regulatory sanctions and reputational harm. Among other matters:

- The Group has been the subject of industry-wide investigations by regulatory and law enforcement authorities relating to interbank and dealer offered rates, as well as civil actions
- Deutsche Bank is currently involved in civil proceedings in connection with its 2010 takeover offer for Postbank
- Deutsche Bank has investigated the circumstances around equity trades entered into by certain clients in Moscow and London and have advised regulatory and law enforcement authorities in several jurisdictions about those trades
- The bank is the subject of industry-wide inquiries and investigations by regulatory and law enforcement authorities relating to transactions of clients in German shares around the dividend record dates for the purpose of obtaining German tax credits or refunds of withholding tax levied on dividend payments (so-called cum-ex transactions), as well as civil actions
- Deutsche Bank has entered into a deferred prosecution agreement (DPA) with the U.S. Department of Justice concerning its historical engagements of finders and consultants and precious metals spoofing. If Deutsche Bank violates the DPA, its term could be extended, or the bank could be subject to criminal prosecution or other actions
- The Group is under continuous examination by tax authorities in the jurisdictions in which it operates
- U.S. Congressional committees and other U.S. governmental entities have sought and may seek information from the Group concerning potential dealings between Deutsche Bank and certain former members of the U.S. executive branch, former President Trump, his family and other close associates
- The Group has received requests for information from regulatory and law enforcement authorities concerning certain former correspondent banking relationships, including Danske Bank, and its anti-financial crime controls, including in the U.S
- Deutsche Bank has received requests for information from regulatory and law enforcement authorities concerning its anti-financial crime controls, including in the United States. In addition, the bank is engaged in ongoing regulatory discussions to resolve matters concerning adherence to prior orders and settlements related to sanctions and embargoes and AML compliance, and remedial agreements and obligations related to risk management issues
- Scrutiny of EU regulators and courts in respect of the protection of retail customers has increased, in particular with a view on the validity and transparency of terms in standard form contracts and compensation for alleged damages
- Deutsche Bank has received requests for information from regulators in connection with its internal investigation into the historical sales of certain FX derivative products. It is also the subject of a civil lawsuit brought by an FX derivative counterparty

Should any of the legal proceedings be resolved against the bank, or any investigations result in a finding that the bank failed to comply with applicable law, the bank could be exposed to material damages, fines, limitations on business, remedial undertakings, criminal prosecution or other material adverse effects on its financial condition, as well as risk to the bank's reputation and potential loss of business as a result of extensive media attention. Guilty pleas by or convictions of the bank or its affiliates in criminal proceedings, or regulatory or enforcement orders, settlements or agreements to which the bank or its affiliates become subject, may have consequences that have adverse effects on certain of its businesses. Moreover, if these matters are resolved on terms that are more adverse to the Group than expected, in terms of the costs or necessary changes to the Group's businesses, or if related negative perceptions concerning its business and prospects and related business impacts increase, the Group may not be able to achieve its strategic objectives or may be required to change them.

Other Risks. Deutsche Bank is also subject to other risks, including the following:

- Deutsche Bank engages in nontraditional credit businesses in which credit is extended in transactions that include holding securities of third parties or in complex derivative transactions, which materially increase the bank's exposure to credit risk
- A substantial proportion of the bank's assets and liabilities comprise financial instruments that the bank carries at fair value, with changes in fair value recognized in its income statement. Deutsche Bank has incurred losses, and may incur further losses, from such changes
- The Group must test the value of the goodwill in its Asset Management division and of its other intangible assets at least annually for impairment. If the test determines that impairment exists, the Group must write down the value of the asset
- The bank must also review its deferred tax assets at the end of each reporting period. If it is no longer probable that sufficient taxable income will be available to allow all or a portion of its deferred tax assets to be utilized, the bank must reduce the carrying amounts
- Impairments of goodwill and other intangible assets and reductions in deferred tax assets have had and may in the future have material adverse effects on Deutsche Bank's profitability, equity and financial condition
- Deutsche Bank is exposed to pension risks which can materially impact the measurement of its pension obligations, including interest rate, inflation, longevity and liquidity risks that can materially impact the Group's earnings
- The Group's risk management policies, procedures and methods leave the Group exposed to unidentified or unanticipated risks, which could lead to material losses
- Operational risks, which may arise from errors in the performance of the bank's processes, the conduct of its employees, instability, malfunction or outage of its IT system and infrastructure, or loss of business continuity, or comparable issues with respect to its third-party service providers, may disrupt the Group's businesses and lead to material losses
- Deutsche Bank utilizes a variety of third parties in support of its business and operations. Services provided by third parties pose risks to the bank comparable to those it bears when performing the services internally, and the bank remains ultimately responsible for the services the third parties provide. If such a third party does not conduct business in accordance with applicable standards or the bank's expectations, the bank could be exposed to material losses or regulatory action, litigation or reputational damage or fail to achieve the benefits sought from the third-party relationship
- The bank faces the risk of breaches of the confidentiality, integrity and availability of its own or its clients' information. This includes risks such as breaches of the security of its own or its vendors' computer systems due to unauthorized access to networks or resources, the introduction of computer viruses or malware, or other forms of cybersecurity attacks or incidents
- Digital innovation and crypto assets, while presenting opportunities, also possess significant risks. The bank may miss opportunities to develop its franchise by missing trends or not sufficiently deploying financial resources in this area
- The size of the bank's clearing operations exposes it to a heightened risk of material losses should it fail to function properly
- Ongoing global benchmark reform efforts, specifically the transition from interbank offered rates to alternative reference rates, introduce a number of inherent risks to the bank's business and the financial industry
- Deutsche Bank is subject to laws and other requirements relating to financial and trade sanctions and embargoes. If it breaches such laws and requirements, it can be subject, and in the past has been subject, to material regulatory enforcement actions and penalties
- Transactions with counterparties in countries designated by the U.S. State Department as state sponsors of terrorism or persons targeted by U.S. economic sanctions may lead potential customers and investors to avoid doing business with the bank or investing in its securities, harm its reputation or result in regulatory or enforcement action

Risks Relating to the Macroeconomic, Geopolitical and Market Environment

As a global corporate and investment bank with a large private client franchise, Deutsche Bank is materially affected by global macroeconomic and financial market conditions. Significant challenges may arise from persistent inflation and rising interest rates, the continuing war in Ukraine, supply chain disruptions, a deteriorating macroeconomic environment and elevated geopolitical risks, the ongoing headwinds posed by regulatory reforms and/or the effects on the bank's legal and regulatory proceedings. Other risks exist with respect to China and from political and economic instability in key markets. These risks could negatively affect the business environment, leading to weaker economic activity and a broader correction in the financial markets. Materialization of these risks could negatively affect the results of operations in some of the bank's businesses and its financial condition as well as its strategic plans. Deutsche Bank's ability to protect itself against these risks is limited.

The war in Ukraine and the related further increase in global inflationary pressures due to higher energy prices, as well as supply chain disruptions, have led to a significant downward revision in global growth forecasts for 2023 and 2024. The likelihood of at least a moderate economic downturn remains elevated as the effects of higher inflation, higher interest rates and tighter financial conditions weigh on economic activity, including in the U.S. economy as the Federal Reserve leads the global tightening cycle. Higher interest rates may also lead to refinancing risks and potential downgrades across the bank's client franchise, and corporate default rates are likely to rise in 2023 and 2024 as clients' earnings fall.

A renewed sharp spike in energy prices or physical shortages diminished remains a downside risk for European corporates and households for 2023 and 2024. Industries which could be affected by energy rationing, in combination with existing supply chain constraints and high commodity prices, include but are not limited to manufacturing, automotive, construction, chemicals and steel, metals and mining as well as critical infrastructure such as utilities, transportation and agriculture. While the majority of Deutsche Bank's clients, especially the larger ones, consider themselves adequately positioned, certain clients are seeing more acute pressures on sales and margins. Also, private clients and households have yet to feel the full impact of energy price increases due to government support measures and could face increasing repayment difficulties should energy prices and broader inflation stay persistently elevated. Amidst the recently improved outlook, the bank also views the risk of a potential gas shortage or need for energy rationing in the winter of 2023/2024 as lower, but downside risks cannot be fully discounted and could have a material impact on the bank due to direct impacts on client defaults and second order effects on economic growth.

Throughout 2022, market and rates developments impacted the Group's ability to distribute and de-risk capital markets commitments, making pricing, hedging and distribution of transactions more challenging. While the Group actively manages systemic risks, it has experienced delays in de-risking individual commitments as well as taken mark-to-market losses in 2022, driven by widening in credit spreads and higher interest rates. The Group could see additional losses in 2023.

Interest rates increased sharply over the course of 2022 and there are expectations that monetary authorities will continue to increase interest rates over the course of 2023. If such increases take place to a greater extent or rate increases are greater than Deutsche Bank or the market anticipates, this may have negative effects on the economy, markets and the bank's businesses. Higher interest rates may also lead to refinancing risks and potential downgrades across the bank's client franchise and corporate default rates are likely to rise in 2023/2024 as clients' earnings fall. Such an environment may also lead to higher instances of idiosyncratic defaults. In addition, inflation, interest rates and market volatility (including also secondary effects on market prices due to supply chain issues) could lead to collateral price reductions with risks related to recovery values in case of liquidation and therefore respective higher impacts on provisions for credit losses. This is particularly relevant in instances where financing is asset based and without recourse to a third party. The bank could therefore experience higher than expected provisions for credit losses.

Provisions for credit losses for the full year 2022 were significantly higher compared to 2021 at 25 bps of average loans. The Group expects provisions in 2023 to be at the low end of a range of 25 to 30 basis points of average loans and, unlike in 2022, to be driven by single-name losses rather than a deterioration of macro-economic forward-looking indicators. Despite the Group's current expectations, there is a risk the macroeconomic environment does not improve and there is further weakening in GDPs, persistent inflation, interest rates continue to rise, and energy prices remain elevated. The implications of such events could become visible across regions and specific, if not all, industries. Overall, the degree of uncertainty remains high and there is the risk of materially higher-than-expected provisions for credit losses, driven by the effects mentioned above, along with potential supply chain disruptions, the fragile geopolitical environment and the overall risk of entering a more recessionary cycle. Deutsche Bank regularly utilizes collateralized loan obligations and credit default swaps to manage concentration risk. However, this may not be sufficient to fully offset potential credit losses.

China related risks are elevated. The government of China has announced a rapid easing of COVID-19 restrictions which led to a notable surge in COVID-19 cases. Recently announced far-reaching U.S. export controls on high-tech goods including advanced semiconductors to China could dent the country's longer term growth potential. Also, there are ongoing concerns over the potential for a broad and persistent deterioration of China's highly leveraged property sector, despite recently announced government support measures. There have been numerous rating actions by external agencies, noting that some of the companies which have seen significant rating deterioration were up until recently investment-grade rated, and widespread liquidity shortages for the sector. Stabilising the economy has become a key priority for the Chinese government, but risks of ongoing liquidity constraints and selected defaults in the property sector remain elevated. In a severe downside, this may lead to broader contagion across weaker enterprises which could drive higher credit provisions.

Overall, in isolation or combination with other risk factors, these risks could lead to a significant deterioration in the Group's portfolio quality and higher-than-expected credit and market losses. This could also lead to accelerated rating declines among clients, leading to increasing provisioning levels as well as increased numbers of clients drawing down on credit facilities which would lead to higher capital requirements and liquidity demands. There would also be a higher risk of idiosyncratic defaults. Higher volatility in financial markets could lead to increased margin calls, higher market risk RWA and elevated valuation reserves. These developments can also impact Deutsche Bank's revenue-generating capabilities and costs, while market declines and volatility could negatively impact the value of financial instruments, drive volatility in the bank's valuation and timing differences and result in impairments of non-financial assets. Also, a decline in financial market liquidity can exacerbate price volatility and the risk of broader market stress. Market volatility, which can also be triggered by unexpected policy decisions or policy mistakes, and by the challenging macro environment, can also lead to increased inherent risks in several non-financial risk types, including transaction processing, internal and external fraud and conduct risks, attempts to conceal losses and increased litigation attempts from clients.

If these risks materialize, or current negative conditions persist or worsen, the bank's business, results of operations or strategic plans could be adversely affected.

In addition to its broader macroeconomic impacts, the war in Ukraine may adversely affect the Group's business and operations.

In response to the war in Ukraine, the West has moved to impose broad-based sanctions (including asset-freeze / blocking sanctions) targeting Russia and Belarus. The sanctions environment remains dependent on the development of the war in Ukraine, and it is possible that new direct or indirect secondary sanctions could be imposed at short notice. It is also likely that current, significant comprehensive sanctions remain in place and that further restrictions will be introduced. The unprecedented scale of sanctions announced to date, not all of which are fully aligned across jurisdictions, has significantly increased operational complexity including the risk of making errors in managing day-to-day business activities within the rapidly evolving sanctions environment. New sanctions as well as countermeasures by the Russian government could also result in differences between the local application / implementation of relevant requirements by Deutsche Bank Moscow and the Deutsche Bank Group (as Deutsche Bank Moscow would have to adhere to local law). Subsequently, this would create conflict of law situations and certain exemptions would have to be applied. Sanctions and Russian countermeasures may also complicate the wind-down of transactions and / or relationships that the bank may wish or need to exit as a result of the war in Ukraine. More broadly, there is an increasing risk that Russia will turn to asymmetric warfare and that Russia or proxy actors will take retaliatory action against the West, which could directly or indirectly affect the bank and its operations.

Deutsche Bank utilises inhouse technology resources in Russia, which contribute to the development of a number of the bank's critical applications, while Deutsche Bank Moscow also relies on certain resources from the Group. The Group is subject to the risk that its ability to utilize these technology resources could be impaired or lost, for instance due to sanctions from the West, Russian state-initiated actions or management actions. Also, the provision of corporate banking services to local subsidiaries of international companies could be negatively affected if its operating subsidiary in Russia is impacted. The impact of the ongoing situation, from both a financial and non-financial risk perspective, remains uncertain and while its direct financial exposures to Russia and Ukraine are contained and have been reduced throughout 2022, higher order effects may materialize in a downside scenario, impacting the Group's ability to meet its stated targets. The regulatory environment or other restrictions including sanctions imposed may result in the bank's business activities related to Russia becoming unviable or the loss of control over its assets. Despite the business continuity and crisis management policies currently in place, the conflict also poses challenges related to personnel as well as loss of business continuity, which may disrupt its business and lead to material losses.

Deutsche Bank is subject to other macroeconomic and geopolitical risks, including with respect to China, which could negatively affect the business environment, leading to weaker economic activity and a broader correction in the financial markets.

The broader geopolitical implications of the war in Ukraine remain uncertain. Over the medium to long term, the International Monetary Fund among others has highlighted the potential impact of deglobalization on living standards and growth. Against this backdrop, tensions between the U.S. and China remain elevated across a wide range of areas, including trade and technology-related issues, Hong Kong, Taiwan, human rights, and cybersecurity. The U.S. has imposed selected sanctions as well as export and investment restrictions on Chinese companies and officials, and China has imposed sanctions on certain U.S. companies and officials and introduced a framework for blocking regulations aimed at the extraterritorial application of sanctions against China. Likewise, the EU has imposed sanctions on China in relation to human rights issues, which were reciprocated by China. Such measures raise potential regulatory compliance and conflicts of law challenges, and the impacts could be material and adverse. While the Group does not expect a China/Taiwan military conflict in the near-term, potential downside impacts from an escalation of tensions are significant and could substantially and adversely affect Deutsche Bank's planned results of operations and financial targets. Likewise, similarly to what was observed in the context of Russia, the intensifying tensions could drive further economic polarization with emergence of distinct China vs. US-led blocks with potential impacts difficult to predict.

Other geopolitical risks which could negatively impact the bank's business environment and its financial targets include an escalation of the war in Ukraine and/or rising political tensions in the Middle East which could drive energy prices even higher. Iran has blamed foreign countries for stoking the ongoing anti-government protests whilst their violent repression and Tehran's closer alignment with Russia diminish the likelihood of a successful revival of the Iran nuclear deal. These developments could increase the risk of conflict in the region.

If any of these risks materialize, they may adversely affect Deutsche Bank's results of operations, strategic plans and targets, and the prices of its shares.

The withdrawal of the United Kingdom from the European Union may have adverse effects on Deutsche Bank's business, results of operations or financial targets.

Since the 2020 departure of the United Kingdom (UK) from the European Union's (EU's) single market and customs union, uncertainty regarding its business impact to the bank and associated economic downside have declined. Deutsche Bank has been able to continue to service EEA (European Economic Area) based clients thanks to its program to move booking of EEA clients to Deutsche Bank AG Frankfurt which was completed before the end of 2020. Sales and coverage staff are in place in European Union member countries to ensure all regulated activity relating to EEA clients is performed within the new licensing laws post Brexit. However, some uncertainty remains as negotiations between the UK and the EU have continued for financial services not extensively covered by the existing deal. In the first half of 2022, the European Commission announced an extension to the current temporary equivalence arrangements for UK CCPs (Central Clearing Counterparties) until June 2025 from June 2022 (when the previous extension expired). Without equivalence between EU and UK regimes for financial services, the bank will be restricted in its ability to provide financial services to and from the UK. Discussions on the nature of this extension and the final outcome in June 2025 will continue in 2023. The European Commission has advised that firms should not expect a further extension to the temporary equivalence in 2025 and should plan accordingly. With effect from December 19, 2022, Deutsche Bank is authorised by the Prudential Regulation Authority (PRA) and subject to regulation by the Financial Conduct Authority (FCA) and limited regulation by the PRA.

Although the economic downside risks related to Brexit has declined, there is still the potential risk the Group's business and financial targets could be adversely affected, particularly since it will depend on future political and market developments.

Risks Relating to Deutsche Bank's Business and Strategy

Deutsche Bank's results of operation and financial condition have in the past been negatively impacted by the market environment, uncertain macroeconomic and geopolitical conditions, lower levels of client activity, increased competition and regulation, along with tightening labor market conditions. If the bank is unable to sustain its improved profitability resulting from its transformation, it may be unable to meet its 2025 targets, and may have difficulty maintaining capital, liquidity and leverage at levels expected by market participants and its regulators.

Deutsche Bank's net revenues increased by 7 % in 2022 compared to 2021. Contributing to this was a significant increase in the Corporate Bank's revenues as well as the Fixed Income & Currencies (FIC) business in the Investment Bank. Private Bank also had significantly higher revenues, although much of the increase was from profit on the sale of the Deutsche Bank Financial Advisors business in Italy. Asset Management had slightly reduced revenues.

The ability of the Corporate Bank to continue its positive performance of 2022 is dependent on its ability to benefit from the higher interest rate environment. The Investment Bank's ability to continue its 2022 performance is dependent on the continuation of FIC's high levels of market activity, and increases in activity and fee pools of the Origination & Advisory business. The performance of the Private Bank and Asset Management divisions will depend in large part on market performance and their ability to counter ongoing fee compression and rising costs. The performance of all divisions will be strongly impacted by macroeconomic effects, in particular whether interest rates and inflation continue to rise, and by geopolitical events and pressures, such as the war in Ukraine and tensions with China, all of which, if they develop unfavorably, would likely impede economic growth and market activity.

Changes in the bank's business mix towards lower-margin, lower-risk products can limit the bank's opportunities to profit from volatility. Regulators have generally encouraged the banking sector to focus more on the facilitation of client flow and less on risk taking, for instance by increasing capital requirements for higher-risk activities. In addition, some of the regulators have encouraged or welcomed changes to the banks business perimeter, consistent with their emphasis on lower-risk activities for banks generally. In recent years, the bank has reduced its exposure to a number of businesses that focused on riskier but more capital-intensive products, which in previous periods had more potential to be highly profitable. Further pressure on revenues and profitability has resulted from long-term structural trends driven by regulation (especially increased regulatory capital, leverage and liquidity requirements and increased compliance costs) and competition that have further compressed margins in many of the Group's businesses. Should a combination of these factors continue to lead to reduced margins and subdued activity levels in the bank's trading and markets business over the longer term, this could impair the bank's ability to reach its financial targets.

[Adverse market conditions, asset price deteriorations, volatility and cautious investor sentiment have affected and may in the future materially and adversely affect Deutsche Bank's revenues and profits, particularly in its investment banking, brokerage and other commission- and fee-based businesses. As a result, the bank has in the past incurred and may in the future incur significant losses from its trading and investment activities.](#)

As a global investment bank, Deutsche Bank has significant exposure to the financial markets and are more at risk from adverse developments in the financial markets than institutions predominantly engaged in traditional banking activities. Sustained market declines have in the past caused and can in the future cause the bank's revenues to decline, and, if the bank is unable to reduce its expenses at the same pace, can cause the bank's profitability to erode or cause the bank to show material losses. Volatility can also adversely affect the Group, by causing the value of financial assets it holds to decline or the expense of hedging its risks to rise. Reduced customer activity can also lead to lower revenues in the "flow" business.

Specifically, investment banking revenues, in the form of financial advisory and underwriting fees, directly relate to the number and size of the transactions in which the Group participates and are susceptible to adverse effects from sustained market downturns. These fees and other income are generally linked to the value of the underlying transactions and therefore can decline with asset values. In addition, periods of market decline and uncertainty tend to dampen client appetite for market and credit risk, a critical driver of transaction volumes and investment banking revenues, especially transactions with higher margins. In recent and other times in the past, decreased client appetite for risk has led to lower levels of activity and lower levels of profitability in the Investment Bank. Deutsche Bank's revenues and profitability could sustain material adverse effects from a significant reduction in the number or size of debt and equity offerings and merger and acquisition transactions.

Market downturns also have led and may in the future lead to declines in the volume of transactions that the bank executes for its clients and result in a decline in its noninterest income. In addition, because the fees that the bank charges for managing its clients' portfolios are in many cases based on the value or performance of those portfolios, a market downturn that reduces the value of clients' portfolios, or increases withdrawals, reduces the revenues the bank receives from its Asset Management and Private Banking businesses. In 2022, Asset Management was impacted by reductions in assets under management arising from negative market performance, as well as the ongoing margin erosion in the asset management industry through both fee compression and rising costs. Even in the absence of a market downturn, below market or negative performance by Asset Management's investment funds may result in increased withdrawals and reduced inflows, which would reduce the revenue the Group receives. While clients would be responsible for losses incurred in taking positions for their accounts, the bank may be exposed to additional credit risk as a result of its need to cover the losses where the bank does not hold adequate collateral or cannot realize it. Deutsche Bank's businesses may also suffer if clients lose money and lose confidence in Deutsche Bank's products and services.

In addition, the revenues and profits the Group derives from many of its trading and investment positions and transactions in connection with them can be directly and negatively impacted by market prices. In each of the product and business lines in which the bank enters into trading and investment positions, part of the bank's business entails making assessments about the financial markets and trends in them. When Deutsche Bank owns assets, market price declines can expose the bank to losses. Many of the more sophisticated transactions of the Investment Bank are influenced by price movements and differences among prices. If prices move in a way not anticipated, the bank may experience losses. Also, when markets are volatile, transactions and positions the bank has entered into may prove to lead to lower revenues or profits, or may lead to losses. In addition, Deutsche Bank has committed capital and takes market risk to facilitate certain capital markets transactions; doing so can result in losses as well as income volatility. Such losses may especially occur on assets the bank holds for which there are not very liquid markets to begin with. Assets that are not traded on stock exchanges or other public trading markets, such as derivatives contracts between banks without publicly quoted prices, may have values that the bank calculates using models. Monitoring the deterioration of prices of assets like these is difficult and could lead to losses the bank does not anticipate. Deutsche Bank can also be adversely affected if general perceptions of risk cause uncertain investors to remain on the sidelines of the market, curtailing clients' activity and in turn reducing the levels of activity in those businesses dependent on transaction flow.

Deutsche Bank's liquidity, business activities and profitability may be adversely affected by an inability to access the debt capital markets or to sell assets during periods of market-wide or firm-specific liquidity constraints. Credit rating downgrades have contributed to increases in its funding costs in the past, and any future downgrade could materially adversely affect its funding costs and the willingness of counterparties to continue to do business with the bank and significantly impact aspects of its business model.

Deutsche Bank has a continuous demand for liquidity to fund its business activities. The Group's liquidity may be impaired by an inability to access secured and/or unsecured debt markets, an inability to access funds from its subsidiaries or otherwise allocate liquidity optimally across its businesses, an inability to sell assets or redeem investments, or unforeseen outflows of cash or collateral. This situation may arise due to circumstances unrelated to the Group's businesses and outside its control, such as disruptions in the financial markets, or circumstances specific to the bank, such as reluctance of counterparties or the market to finance the Group's operations due to perceptions about potential outflows (including deposit outflows) resulting from litigation, regulatory and similar matters, actual or perceived weaknesses in its businesses, business model or strategy, as well as in the Group's resilience to counter negative economic and market conditions. Reflecting these conditions, internal estimates of the bank's available liquidity over the duration of a stressed scenario could at times be negatively impacted.

In addition, negative developments concerning other financial institutions perceived to be comparable to the Group and negative views about the financial services industry in general can also affect the bank. These perceptions could affect the prices at which the Group could access the capital markets to obtain the necessary funding to support its business activities; should these perceptions exist, continue or worsen, the Group's ability to obtain this financing on acceptable terms may be adversely affected. Among other things, an inability to refinance assets on its balance sheet or maintain appropriate levels of capital to protect against deteriorations in its value could force the bank to liquidate assets it holds at depressed prices or on unfavorable terms, and could also force the bank to curtail business, such as the extension of new credit. This could have an adverse effect on the bank's business, financial condition and results of operations. Additionally, the Group needs to ensure its ongoing ability to refinance business activities in their respective currencies.

Quantitative tightening by central banks, as a way of managing inflation, has led to rising interest rates. This in turn, is reducing money supply, increasing the pressure on funding markets and impacting the valuations of liquid assets. If inflation persists, this could necessitate even further central bank tightening, which could trigger a significant economic slowdown in Europe and the US and could lead to a rise of defaults across corporates. As a result, disruptions in the financial markets, or circumstances specific to the Group, such as a reluctance of counterparties to finance the bank's operations due to perceptions of the bank's financial strength resulting from litigation, regulatory matters, actual or perceived weaknesses in the bank's businesses, business model or strategy, as well as in the bank's resilience in countering negative economic and market conditions, could occur. The ECB may also amend the terms of its monetary policy tools which could adversely impact Deutsche Bank's revenue development, change the bank's interest rate sensitivity and may affect broader market pricing.

Additionally, persistently high inflation and consumer price levels could lead to a decline in levels of deposits in Deutsche Bank's core retail markets as consumers use their savings to compensate for higher expenses. This might foster price competition among banks for retail deposits increasing Deutsche Bank's funding costs, as well as putting further pressure on the volume of Deutsche Bank's retail deposits, which are one of the main funding sources for the bank.

Uncertain macroeconomic developments could negatively affect Deutsche Bank's ability to transact foreign exchange (FX) trades due to volatility in the FX markets or if counterparties are concerned about its ability to fulfil agreed transaction terms and therefore seek to limit their exposure. Additionally, increased FX mismatches on the bank's balance sheet may lead to increased collateral outflows if the euro (Deutsche Bank's local currency) materially depreciates against other major currencies and may lead to difficulties to support liquidity needs in different currencies.

As part of emerging risks, digital payments and blockchain are assessed as areas which could impact the depth and volatility of market liquidity and funding and may temporarily impact cost of funding and thereby adversely affect profitability.

Liquidity risk could also arise from lower value and marketability of Deutsche Bank's liquidity reserves, as these would affect the amount of proceeds available for covering cash outflows during a stress event. Additional haircuts may be incurred on top of already impaired asset values. Moreover, securities might lose their eligibility as collateral necessary for accessing central bank facilities, as well as their value in the repo/wholesale funding market. At the same time, the Group's liquidity position may also be impaired in situations where its counterparty on, for example, a derivative contract is not current on an obligation to post collateral, in which case the bank has to cover for the shortfall through other means.

In addition, Deutsche Bank has benefited in recent years from a number of incremental measures by the ECB and other central banks that provided additional liquidity to financial institutions and the financial markets, particularly in the Eurozone. For example, Deutsche Bank's interest income in 2022 included € 211 million related to EU government grants under the TLTRO III program. To the extent these actions are curtailed or halted, the Group's funding costs could increase, or its funding supply could decrease, which could in turn result in a reduction in business activities. A large tranche of the TLTRO III will expire in June 2023, which will reduce its benefits going forward. In 2022, the ECB and the Federal Reserve have tightened their monetary policy.

Deutsche Bank's credit ratings have been upgraded in 2022 by all three leading rating agencies. Despite the recent upgrades, rating agencies regularly review the banks credit ratings, and such reviews could be negatively affected by a number of factors that can change over time, including the credit rating agency's assessment of: the Group's strategy and management's capability; its financial condition including in respect of profitability, asset quality, capital, funding and liquidity; the level of political support for the industries in which the bank operates; the implementation of structural reform; the legal and regulatory frameworks applicable to the bank's legal structure; business activities and the rights of the bank's creditors; changes in rating methodologies; changes in the relative size of the loss-absorbing buffers protecting bondholders and depositors; the competitive environment, political and economic conditions in the bank's key markets; and market uncertainty. In addition, credit ratings agencies are increasingly taking into account environmental, social and governance factors, including climate risk, as part of the credit ratings analysis, as are investors in their investment decisions.

Any reductions in the Group's credit ratings, including, in particular, downgrades below investment grade, or a deterioration in the capital markets' perception of its financial resilience could significantly affect the banks access to money markets, reduce the size of its deposit base and trigger additional collateral or other requirements in derivatives contracts and other secured funding arrangements or the need to amend such arrangements, which could adversely affect the cost of funding and access to capital markets and could limit the range of counterparties willing to enter into transactions with the bank. This could in turn adversely impact Deutsche Bank's competitive position and threaten its prospects in the short to medium-term.

In the past, major credit rating agencies lowered Deutsche Bank's credit ratings or placed them on review or negative watch on multiple occasions. These credit rating downgrades contributed to an increase in funding costs. Despite the recent upgrades, the Group's credit spread levels (meaning the difference between the yields on its securities as compared to benchmark government bonds) are sensitive to further adverse developments and severe future downgrades could bring its credit rating into the non-investment grade category. This could materially and adversely affect the Group's funding costs and significant aspects of its business model. The effect would depend on a number of factors including whether a downgrade affects financial institutions across the industry or on a regional basis, or is intended to reflect circumstances specific to Deutsche Bank, such as potential settlement of regulatory, litigation and similar matters; any actions senior management may take in advance of or in response to the downgrade; the willingness of counterparties to continue to do business with the bank; any impact of other market events and the state of the macroeconomic environment more generally.

Additionally, under many of the contracts governing derivative instruments to which the bank is a party, a downgrade could require the bank to post additional collateral, lead to terminations of contracts with accompanying payment obligations for the bank or give counterparties additional remedies. Deutsche Bank takes these effects into account in its liquidity stress testing analysis, as further described in "Management Report: Risk Report: Liquidity Risk: Stress Testing and Scenario Analysis" in the Annual Report 2022.

If Deutsche Bank is unable to meet its 2025 financial targets or incurs future losses, including further impairments and provisions, or low profitability, its financial condition, results of operations and share price may be materially and adversely affected, and it may be unable to make contemplated distributions of profits to its shareholders or carry out share buybacks.

In March 2022, Deutsche Bank outlined its strategic and financial roadmap through 2025, which aims to position Deutsche Bank as a “Global Hausbank”, and communicated Deutsche Bank’s 2025 financial targets and capital objectives.

The ‘Global Hausbank’ strategy is underpinned by key themes which have become even more important in the light of the geopolitical and macro-economic upheavals of 2022. In this environment, Deutsche Bank aims to leverage a more favorable interest rate environment, deploy its risk management expertise to support clients, and allocate capital to high-return growth opportunities. As sustainability becomes ever more important, the bank aims to deepen its dialogue with and support for clients and broaden the agenda in respect of its own operations. As technology continues to evolve, the bank aims to reap further cost savings, accelerate the transition to a digital bank, and expand upon strategic partnerships which are already creating substantial value.

Furthermore, the Group also announced several key pillars of efficiency measures contributing to Deutsche Bank’s 2025 targets, which are expected to deliver structural cost savings of more than € 2 billion between 2022 and 2025. These include:

- Germany platform optimization: Branch reductions and technology integration of the IT platform aimed at creating efficiencies by simplifying the Group’s infrastructure
- Re-architecture and simplification of the Group’s application landscape: Decommissioning unnecessary software applications and migrating key applications to the cloud
- Front-to-back process re-design: Continue automating controls and processes, including front-to-back loans processing, risk management and reporting processes
- Infrastructure efficiency: Continue to focus on optimizing the bank’s workforce management and to optimize its global office space footprint. The bank has identified additional cost savings in infrastructure efficiency

Deutsche Bank’s financial targets and capital objectives for 2025 are:

Financial targets:

- Post-tax Return on Average Tangible Equity of above 10% for the Group
- Compounded annual growth rate of revenues of 3.5 to 4.5%
- Cost/income ratio of less than 62.5%

Capital objectives:

- Common Equity Tier 1 capital ratio approximately 13%
- 50% Total payout ratio from 2025

Deutsche Bank is committed to delivering sustainably growing cash dividends and, over time, returning to shareholders excess capital that is over and above what is required to support profitable growth and upcoming regulatory changes through share buybacks, subject to regulatory approval, shareholder authorization and meeting German corporate law requirements. To that end, subject to meeting the Group’s strategic targets, the Management Board intends to grow the cash dividend per share by 50 % per annum in the next 3 years, starting from the € 0.20 per share paid for the financial year 2021. This would translate into approximately € 3.3 billion of cumulative dividend payments by 2025 with respect to financial years 2021-2024. In relation to the financial year 2024 the bank intends to achieve a total payout ratio of 50 % from a combination of dividends paid and share buybacks executed in 2025; and the bank intends to maintain a 50 % total payout ratio in subsequent years. In addition to the share buyback of € 0.3 billion already concluded in 2022, successfully executing the Group’s financial and strategic plans through 2025 would therefore support the previously announced cumulative distributions to shareholders in the form of dividends paid or share buybacks executed of approximately € 8 billion in respect of financial years 2021-2025. Deutsche Bank’s ambition to return capital to shareholders is further underpinned by the bank’s aim to maintain a robust Common Equity Tier 1 (CET 1) capital ratio of approximately 13 %, i.e. to operate with a buffer of 200 basis points above the Maximum Distributable Amount (MDA) threshold the Group currently assumes to prevail over time.

Deutsche Bank's strategic goals are subject to various internal and external factors and to market, regulatory, economic and political uncertainties, and to limitations relating to the bank's operating model. These could negatively impact the implementation of the bank's strategic goals, the realization of their anticipated benefits, or the ability to achieve the bank's financial targets for 2025. In particular, Deutsche Bank's strategic objectives are subject to the following assumptions and risks:

- Geopolitical developments, especially the war in Ukraine, may impact global and regional economies and markets other than in short-term ways and may result in adverse effects on the bank's business, results of operations or strategic plans and targets, and the prices of the bank's securities. Other geopolitical risks exist with respect to China and from political and economic instability in key markets
- While the COVID-19 pandemic receded rapidly in 2022, the ongoing impact on economies, as well as the potential for resurgence, remains as risks
- The base case scenario for the bank's financial and capital plan includes revenue growth estimates which are dependent on positive macroeconomic developments. Stagnation or a downturn in the macroeconomic environment could significantly impact the bank's ability to generate the revenue growth necessary to achieve these strategic financial and capital targets. This base case scenario also includes assumptions regarding the bank's ability to reduce costs in future periods
- In addition, the bank's base case scenario is based on current market implied forward interest rate curves. If interest rates do not evolve as expected, the bank's revenues may not develop as the bank anticipates
- The bank's objectives are also based on assumptions regarding inflation levels, which have risen sharply over the past year, in particular for fossil fuels, other raw materials and food, and the outlook for which remains uncertain. If inflation does not develop as the bank expects, or if the bank's commercial leverage with suppliers and third parties does not enable the bank to resist inflationary pressures, the bank's businesses may be adversely impacted and the bank's costs may increase
- The bank's plans are based upon December 31, 2022 foreign exchange rates, particularly with respect to the euro and U.S. dollar. If exchange rates change from these levels, the bank's ability to achieve its goals may be adversely affected.
- Results in 2022 of the Corporate Bank and Investment Bank FIC division were supported by high levels of market activity. The ability of these businesses to continue their performance is dependent on the continuation of these conditions
- For 2023, the Group expects provisions for credit losses to be at the low end of the range between 25 and 30 basis points as a percentage of average loans. Should higher levels of provisions for credit losses be required, the bank's results of operations and the bank's ability to meet its financial and capital targets may be adversely affected
- The bank continues to rely on the bank's trading and markets businesses as a significant source of profit, but, depending on economic and market conditions, such businesses may be adversely impacted or be unable to achieve the profitability expected from them
- From time to time, asset and client levels have been impacted by the negative market perceptions of Deutsche Bank. A continued or renewed negative market focus on Deutsche Bank could result in lower client levels and asset outflows
- In the event that staff attrition levels increase versus historical levels, this may adversely affect the bank's ability to attract and retain talented personnel, particularly in front-office positions that are key to revenue generation and in positions key to improving the bank's control environment
- Regulatory changes, including tax law changes, could also adversely impact the bank's ability to achieve its targets and objectives. In particular, regulators could demand changes to the bank's business model or organization that could reduce the bank's profitability, or force it to make changes that reduce the bank's profitability in an effort to remain compliant with laws and regulations
- The bank is involved in numerous litigation, arbitration and regulatory proceedings, investigations and tax examinations in Germany and in a number of jurisdictions outside of Germany, especially in the United States. Such matters are subject to many uncertainties. The Group expects the litigation environment to continue to be challenging. If litigation and regulatory matters occur at the same or higher rate and magnitude than they have in some recent years or if Deutsche Bank is subject to sustained market speculation about its potential exposure to such matters, the bank may not be able to achieve its targets and objectives
- The bank currently operates a highly complex infrastructure, which can compromise the quality of the overall control environment. Establishing a more efficient bank with a strong control environment depends on successfully streamlining and simplifying the bank's IT landscape as well as cultural change
- A robust and effective internal control environment is necessary to ensure that the bank conducts its business in compliance with the laws and regulations applicable to the bank. Deutsche Bank may be unable to complete initiatives to enhance the efficacy of the bank's internal control environment as quickly as intended or as regulators demand, and the bank's efforts may be insufficient to prevent all future deficiencies in its control environment or result in fewer litigations or regulatory and enforcement investigations and proceedings in the future. Furthermore, implementation of enhanced controls may result in higher-than-expected costs of regulatory compliance that could offset efficiency gains
- If some of the above risks were to materialize such that the bank's revenues would be negatively impacted or the cost base would significantly increase, the bank may not be able to achieve its cost-income ratio target of less than 62.5 % for 2025. For example, revenues could fall short of the bank's expectations or expenses such as bank levies, litigation expenses, or staff costs may be higher than expected

If the Group fails to implement its strategic initiatives in whole or in part or should the initiatives that are implemented fail to produce the anticipated benefits, or the costs incurred to implement the initiatives exceed the amounts anticipated, or the Group fails to achieve the publicly communicated targets it has set for implementation of these initiatives, the bank may fail to achieve its financial objectives, incur losses or have low profitability or erosions of its capital base, and its financial condition, results of operations and share price may be materially and adversely affected.

The bank may have difficulties selling companies, businesses or assets at favorable prices or at all and may experience material losses from these assets and other investments irrespective of market developments.

The Group seeks to sell or otherwise reduce its exposure to assets that are not part of its core business or as part of its strategy to simplify and focus the business and to meet or exceed capital and leverage requirements, as well as to help the bank meet its return on tangible equity targets. The Group has already sold a substantial portion of its non-core assets, and its remaining non-core assets may be particularly difficult to sell as quickly as the Group had expected at prices it deems acceptable. Where the bank sells companies or businesses, it may remain exposed to certain losses or risks under the terms of the sale contracts, and the process of separating and selling such companies or businesses may give rise to operating risks or other losses. Unfavorable business or market conditions may make it difficult for the bank to sell companies, businesses or assets at favorable prices, or may preclude a sale altogether. If the bank cannot reduce its assets according to plan, it may not be able to achieve the capital targets set out under its strategy.

Deutsche Bank may have difficulty in identifying and executing business combinations, and both engaging in combinations and avoiding them could materially harm the Group's results of operations and its share price.

The Group considers business combinations from time to time. Were the bank to announce or complete a significant business combination, its share price or the share price of the combined entity could decline significantly if investors viewed the transaction as too costly, dilutive to existing shareholders or unlikely to improve its competitive position. Also, the need to revalue certain classes of assets at fair value in a business combination may make transactions infeasible. It is generally not feasible for reviews of any business with which the bank might engage in a combination to be completed in all respects. As a result, a combination may not perform as well as expected. In addition, the bank may fail to integrate its operations successfully with any entity with which it participates in a business combination. Failure to complete announced business combinations or failure to achieve the expected benefits of any such combination could materially and adversely affect profitability. Such failures could also affect investors' perception of the business prospects and management, and thus cause the share price to fall. It could also lead to departures of key employees, or lead to increased costs and reduced profitability if the bank felt compelled to offer key employees financial incentives to remain.

If Deutsche Bank avoids entering into business combinations or if announced or expected transactions fail to materialize, market participants may perceive the bank negatively. The Group may also be unable to expand its businesses, especially into new business areas, as quickly or successfully as competitors if the Group does so through organic growth alone. These perceptions and limitations could cost the bank business and harm its reputation, which could have material adverse effects on the financial condition, results of operations and liquidity.

Intense competition, in Deutsche Bank's home market of Germany as well as in international markets, has and could continue to materially adversely impact revenues and profitability.

Competition is intense in all of the bank's primary business areas, in Germany as well as in international markets. If the bank is unable to respond to the competitive environment in these markets with attractive product and service offerings that are profitable, the bank may lose market share in important areas of its business or incur losses on some or all of its activities. In addition, downturns in the economies of these markets could add to the competitive pressure, for example, through increased price pressure and lower business volumes.

There has been substantial consolidation and convergence among financial services companies. This trend has significantly increased the capital base and geographic reach of some competitors and has hastened the globalization of the securities and other financial services markets. As a result, Deutsche Bank must compete with financial institutions that may be larger and better capitalized and may have a stronger position in local markets.

In addition to the Group's traditional competitors such as other universal banks and financial services firms, an emerging group of future competitors in the form of start-ups and technology firms, including those providing "fintech" services, are showing an increasing interest in banking services and products. These new competitors could increase competition in both core products, e.g., payments, basic accounts and loans and investment advisory, as well as in new products, e.g., peer to peer lending and equity crowd funding. Such firms are also potential competitors in attracting and retaining talented personnel.

Risks Relating to Regulation and Supervision

Regulatory reforms enacted and proposed in response to weaknesses in the financial sector and, more recently, to the envisaged transition towards a sustainable economy, together with increased regulatory scrutiny more generally, have had and continue to have a significant impact on the bank and may adversely affect its business and ability to execute its strategic plans. Competent regulators may prohibit the bank from making dividend payments, share repurchases or payments on its regulatory capital instruments or take other actions if the Group fails to comply with regulatory requirements.

Governments and regulatory authorities have worked and continue to work to enhance the resilience of the financial services industry against future crises through changes to the regulatory framework. The pace of change of new proposals has slowed as the focus turns more to the final implementation of the regulatory reform agenda outlined by the Basel Committee on Banking Supervision (Basel Committee) and, more recently, to efforts to facilitate the envisaged transition towards a sustainable economy (the “Green Deal”). As a result, there continues to be uncertainty for the Group and the financial industry in general, though the level of uncertainty is reduced from prior periods. The range of new (or revised) laws and regulations or current proposals includes, among other things:

- Provisions for more stringent regulatory capital, leverage and liquidity standards, now also focusing on the financial sector’s transformation towards climate neutrality
- Prudential treatment of crypto, green and brown assets
- Restrictions on compensation practices
- Restrictions on proprietary trading and other investment services
- Special bank levies
- Tightened large exposure limits
- Stress testing and capital planning regimes, also with respect to environment, social and governance risks
- Heightened reporting requirements, and
- Reforms of derivatives, other financial instruments, investment products and market infrastructures

As a core element of the reform of the regulatory framework, the Basel Committee developed and continuously refined and supplemented a comprehensive set of rules regarding minimum capital adequacy and liquidity standards as well as other rules, known as Basel 3. The initial set of rules was implemented into European and national law (including German, under which Deutsche Bank AG is incorporated) beginning in 2014, with the European legislative package also referred to as “CRR/CRD IV” and the Bank Recovery and Resolution Directive (or BRRD), which provides for a resolution framework for banks. The set of rules was further strengthened with a comprehensive package of reforms in 2019 also referred to as “CRR II/CRD V” and “BRRD II”. The reform package also implemented certain regulatory proposals of the Financial Stability Board (FSB) regarding a requirement for global systemically important institutions (G-SIIs), such as Deutsche Bank, to hold certain minimum levels of capital and other instruments which are capable of bearing losses in resolution (“Total Loss-Absorbing Capacity” or TLAC).

On October 27, 2021, the European Commission published a comprehensive package of reforms with respect to the European Union banking rules (the “Banking Package 2021”) to ensure that banks become more resilient to potential future economic shocks while contributing to the European Union’s recovery from the COVID-19 pandemic and its transition to climate neutrality. The proposals aim to amend the Capital Requirements Regulation (CRR), the Capital Requirements Directive (CRD) and the BRRD. If adopted, the proposals to amend the CRR and CRD (commonly referred to as “CRR III” and “CRD VI”) will, in particular, finalize the implementation of the Basel 3 framework in the European Union and also fully implement the market risk capital changes in the Fundamental Review of the Trading Book (FRTB). Another separate proposal entails combined amendments to the CRR and the BRRD with respect to the resolution regime.

CRR III and CRD VI include, among other things, a gradually introduced output floor establishing minimum risk-weighted assets that will ultimately be set at 72.5 % of the risk-weighted assets calculated under the standardized approach, changes to standardized and internal ratings-based approaches for determining credit risk, changes to the credit valuation adjustment, a revision of the approaches for operational risks and reforms to the market risk framework as set out in the FRTB, adjustments to the Pillar 2 requirements and the systemic risk buffer (SyRB) and a “fit-and-proper” set of rules for the senior staff managing banks. Other proposed measures are aimed to address sustainability risks by requiring banks to identify, disclose and manage environmental, social and governance risks as part of their risk management framework and include regular climate stress testing by the banks’ supervisors. The proposal does not entail any adjustments to the capital requirements for green or brown assets. However, the European Commission has already stated that it is exploring this idea and has asked the European Banking Authority (EBA) to assess possible adjustments. It is expected that the EBA will provide its final report by mid-2023. Depending on the outcome of the negotiation, CRR III and CRD VI may include provisions on the capital treatment of crypto assets.

The proposals regarding the resolution regime include clarifications with respect to some aspects of the TLAC / minimum requirement for own funds and eligible liabilities (MREL) regime in relation to single point of entry and multiple point of entry resolution strategies and, in particular, a deduction regime requiring intermediate parents to deduct from its own internal MREL capacity the amount of holdings of internal MREL eligible instruments, including own funds, issued by its subsidiaries belonging to the same resolution group.

The Banking Package 2021 will continue to be negotiated with EU lawmakers, i.e. the European Parliament and the Council. The Council reached its position on the implementation of the Banking Package 2021 in November 2022, and the European Parliament reached its position in February 2023. The proposal of the European Parliament entails, in particular, an amendment that would require banks to apply a risk-weighting of 1,250% of capital to crypto assets exposures. It is expected that CRR III and CRD VI will start entering into force at the end of 2023 at the earliest with the new rules implementing Basel 3 to apply from January 1, 2025. According to an assessment conducted by the EBA, the full implementation of the Basel 3 framework in the European Union could lead to an increase in the minimum capital requirements of all European banks of 10.7 % and of 20.0 % for G-SIIs.

The implementation of the remaining outstanding proposals under Basel 3 as contained in the Banking Package 2021 has the potential to increase risk-weighted assets and will likely affect the business by raising the bank's regulatory capital and liquidity requirements and by leading to increased costs. Such requirements may be in addition to regulatory capital buffers that may also be increased or be in addition to those already imposed on the Group and could materially increase the Group's capital requirements.

In addition, regulatory scrutiny of compliance with existing laws and regulations has become more intense and supervisory expectations remain significant. The specific effects of a number of new (or revised) laws and regulations remain uncertain because the drafting and implementation of these laws and regulations are still on-going and supervisory expectations continue to develop.

Regulatory authorities have substantial discretion in how to regulate banks, and this discretion, and the means available to the regulators, have been steadily increasing during recent years. Regulation may be imposed on an ad hoc basis by governments and regulators in response to ongoing or future crises (such as the COVID-19 pandemic) and the Green Deal and may especially affect financial institutions such as Deutsche Bank that are deemed to be systemically important.

In particular, the regulators with jurisdiction over Deutsche Bank, including the ECB under the Single Supervisory Mechanism (also referred to as the "SSM"), may, in connection with the supervisory review and evaluation process (SREP), SSM-wide reviews of asset quality or internal risk models or otherwise, conduct stress tests. They have discretion to impose capital surcharges on financial institutions for risks, including for litigation, regulatory and similar matters, that are not otherwise recognized in risk-weighted assets or other surcharges depending on the individual situation of the bank. Such adjustments may, for example, reflect additional risks posed by deficiencies in Deutsche Bank's control environment, or come as a result of supervisory inspections concerning the treatment of specific products or transactions. One of these areas in focus of the ECB with regard to risk taking is leveraged lending, for which the ECB in March 2022 clarified their expectations for all banks under the SSM. The ECB announced that it intends to follow up on its expectation using a wide range of supervisory tools and to take measures in future SREP decisions for institutions which the ECB assesses as non-compliant with these expectations. The ECB may take or require other measures, such as restrictions on or changes to the business. In this context, the ECB may impose, and has imposed, on the bank individual capital requirements resulting from the SREP which are referred to as Pillar 2 requirements. Institutions must meet their Pillar 2 requirements with at least 75 % of Tier 1 capital and at least 56.25 % of Common Equity Tier 1 capital. Pillar 2 requirements must be fulfilled in addition to the statutory minimum capital and buffer requirements and any non-compliance may have immediate legal consequences such as restrictions on dividend payments.

Also following the SREP, the ECB may communicate to individual banks, and has communicated to Deutsche Bank, an expectation to hold a further Pillar 2 Common Equity Tier 1 capital add-on, the so-called Pillar 2 guidance. Although the Pillar 2 guidance is not legally binding and failure to meet it does not automatically trigger legal action, the ECB has stated that it generally expects banks to meet the Pillar 2 guidance. During the COVID-19 pandemic, the ECB temporarily allowed banks to operate below the level of capital defined by the Pillar 2 guidance. Since January 1, 2023, banks are expected again to operate above Pillar 2 guidance.

Further, effective as of February 1, 2022, the BaFin set the CCyB at 0.75 %, and banks have had to comply with this CCyB requirement since February 1, 2023.

Following the 2022 SREP, Deutsche Bank has been informed by the ECB of its decision regarding prudential capital requirements to be maintained from January 1, 2023 onwards, that Deutsche Bank's Pillar 2 requirement will increase by 20 bps. The increase is driven by the ECB's newly introduced separate assessment of risks stemming from leveraged finance activities.

Also, more generally, competent regulators may, if the bank fails to comply with regulatory requirements, in particular with statutory minimum capital requirements or Pillar 2 requirements, or if there are shortcomings in Deutsche Bank's governance and risk management processes, prohibit the bank from making dividend payments to shareholders or distributions to holders of other regulatory capital instruments. This could occur, for example, if the bank fails to make sufficient profits due to declining revenues, or as a result of substantial outflows due to litigation, regulatory and similar matters. Generally, a failure to comply with the quantitative and qualitative regulatory requirements could have a material adverse effect on Deutsche Bank's business, financial condition and results of operations, including the Group's ability to pay out dividends to shareholders or distributions on other regulatory capital instruments or, in certain circumstances, conduct business which Deutsche Bank currently conducts or plans to conduct in the future.

The regulatory and legislative environment requires Deutsche Bank to maintain increased capital and bail-inable debt (debt that can be bailed in in resolution) and abide by tightened liquidity requirements. These requirements may significantly affect the bank's business model, financial condition and results of operations, as well as the competitive environment generally. Any perceptions in the market that the bank may be unable to meet its capital or liquidity requirements with an adequate buffer, or that the bank should maintain capital or liquidity in excess of these requirements, or any other failure to meet these requirements, could intensify the effect of these factors on its business and results.

The implementation of the CRR/CRD IV legislative package resulted, among other things, in increased capital and tightened liquidity requirements, including additional capital buffer requirements which were gradually phased in through January 1, 2019. Further revisions, such as stricter rules on the measurement of risks and the changes introduced by the CRR II/CRD V/BRRD II reform package, increased risk-weighted assets and the corresponding capital demand for banks, as well as tightened liquidity requirements (such as the introduction of a binding Net Stable Funding Ratio (NSFR)). In addition, the introduction of a binding leverage ratio (including the leverage ratio buffer) affected the business model, financial conditions and results of operations.

Furthermore, under the SRM Regulation, the BRRD and the German Recovery and Resolution Act (Sanierungs- und Abwicklungsgesetz), Deutsche Bank is required to meet at all times a robust MREL which is determined on a case-by-case basis by the competent resolution authority. In addition, the CRR II/CRD V/BRRD II reform package implemented the FSB's TLAC standard for global systemically important banks (G-SIBs, such as Deutsche Bank) by introducing a Pillar 1 MREL requirement for G-SIBs (the European equivalent term for G-SIBs). This requirement is based on both risk-based and non-risk-based denominators and will be set at the higher of 18 % of total risk exposure and 6.75 % of the leverage ratio exposure measure. It can be met with Tier 1 or Tier 2 capital instruments or debt that meets specific eligibility criteria. Deduction rules apply for holdings by G-SIBs of TLAC instruments of other G-SIBs. In addition, the competent authorities have the ability to impose on G-SIBs individual MREL requirements that exceed the statutory minimum requirements. As described above, the European Commission included clarifications with respect to the TLAC / MREL regime in its legislative proposals of October 27, 2021.

Both the TLAC (or Pillar 1 MREL) and MREL requirements are specifically designed to require banks to maintain a sufficient amount of instruments which are eligible to absorb losses in resolution with the aim of ensuring that failing banks can be resolved without recourse to taxpayers' money. To that end, in order to facilitate the meeting of TLAC requirements by German banks, obligations of German banks under certain specifically defined senior unsecured debt instruments issued by them (such as bonds that are not structured debt instruments) rank, since 2017, junior to all other outstanding unsecured unsubordinated obligations of such bank (such as deposits, derivatives, money market instruments and certain structured debt instruments), but continue to rank in priority to contractually subordinated debt instruments (such as Tier 2 instruments).

As part of the harmonization of national rules on the priority of claims of banks' creditors in the European Union, the BRRD allows banks to issue "senior non-preferred" debt instruments ranking according to their terms (and not only statutorily) junior to the bank's other unsubordinated debt instruments (including bonds that are not treated as "senior non-preferred" debt instruments), but in priority to the bank's contractually subordinated liabilities (such as Tier 2 instruments). Any such "senior non-preferred" debt instruments issued by Deutsche Bank AG under such rules rank on parity with its then outstanding "senior non-preferred" debt instruments under the prior rules. This BRRD amendment was finalized and implemented into German law as of July 21, 2018.

The need to comply with these requirements may affect the Group's business, financial condition and results of operation and in particular may increase its financing costs.

The Group may not have sufficient capital or other loss-absorbing liabilities to meet these increasing regulatory requirements. This could occur due to regulatory changes and other factors, such as the bank's inability to issue new securities which are recognized as regulatory capital or loss-absorbing liabilities under the applicable standards, due to an increase of risk-weighted assets based on more stringent rules for the measurement of risks or as a result of a future decline in the value of the euro as compared to other currencies, due to stricter requirements for the compliance with the non-risk based leverage ratio, due to any substantial losses the bank may incur, which would reduce retained earnings, a component of Common Equity Tier 1 capital, or due to a combination of these or other factors.

If the bank is unable to maintain sufficient capital to meet the applicable minimum capital ratios, the buffer requirements, any specific Pillar 2 capital requirements, leverage ratio requirements, or TLAC or MREL requirements, the bank may become subject to enforcement actions and/or restrictions on the pay-out of dividends, share buybacks, payments on other regulatory capital instruments, and discretionary compensation payments. In addition, any requirement to increase risk-based capital ratios or the leverage ratio could lead the Group to adopt a strategy focusing on capital preservation and creation over revenue generation and profit growth, including the reduction of higher margin risk-weighted assets. If the bank is unable to increase its capital ratios to the regulatory minimum in such a case or by raising new capital through the capital markets, through the reduction of risk-weighted assets or through other means, the bank may be required to activate its group recovery plan. If these actions or other private or supervisory actions do not restore capital ratios to the required levels, and the Group is deemed to be failing or likely to fail, competent authorities may apply resolution powers under the Single Resolution Mechanism (SRM) and applicable rules and regulations, which could lead to a significant dilution of shareholders' or even the total loss of the Group's shareholders' or creditors' investment.

The CRR introduced a liquidity coverage requirement intended to ensure that banks have an adequate stock of unencumbered high quality liquid assets that can be easily and quickly converted into cash to meet its liquidity needs for a 30-calendar day liquidity stress scenario. The required liquidity coverage ratio (LCR) is calculated as the ratio of a bank's liquidity buffer to its net liquidity outflows. Also, banks must regularly report the composition of the liquid assets in its liquidity buffer to their competent authorities.

In addition, the CRR II/CRD V/BRRD II reform package introduced the NSFR to reduce medium- to long-term funding risks by requiring banks to fund its activities with sufficiently stable sources of funding over a one-year period. The NSFR, which applies since June 28, 2021, is defined as the ratio of a bank's available stable funding relative to the amount of required stable funding over a one-year period. Banks must maintain an NSFR of at least 100 %. The ECB may impose on individual banks liquidity requirements which are more stringent than the general statutory requirements if the bank's continuous liquidity would otherwise not be ensured. The NSFR applies to both the Group as a whole and to individual SSM regulated entities, including the parent entity Deutsche Bank AG.

If Deutsche Bank fails to meet liquidity requirements, the bank may become subject to enforcement actions. In addition, any requirement to maintain or increase liquidity could lead the bank to reduce activities that pursue revenue generation and profit growth.

Deutsche Bank is regularly subject to stress tests, including stress tests on the effects of climate change. The next EU-wide stress test will be carried out in 2023 and the EBA plans to publish the results for the individual banks by the end of July 2023. The EBA will coordinate the EU-wide stress test in cooperation with the ECB and national supervisory authorities. A total of 99 directly supervised banks, including Deutsche Bank, will be stress tested by the ECB which announced that it will carry out a deep dive on leveraged finance exposures for selected banks with material leveraged finance activities. The adverse scenario used in the test is based on a narrative of hypothetical heightened geopolitical tensions, with high inflation and higher interest rates having strong adverse effects on private consumption and investments, both domestically and globally. In terms of GDP decline, the 2023 adverse scenario is the most severe used in the European Union wide stress testing up to now. The stress test results will be used to update each bank's Pillar 2 guidance in the context of the SREP. Qualitative findings on weaknesses in Deutsche Bank's stress testing practices could also affect Deutsche Bank's Pillar 2 requirements.

In some cases, the bank is required to hold and calculate capital and to comply with rules on liquidity and risk management separately for its local operations in different jurisdictions, in particular in the United States.

Deutsche Bank is required to hold and calculate capital and to comply with rules on liquidity and risk management separately for its local operations in different jurisdictions. Federal Reserve Board rules set forth how the U.S. operations of certain foreign banking organizations (FBOs), such as Deutsche Bank, are required to be structured, as well as the enhanced prudential standards that apply to their U.S. operations. Under these rules, a large FBO with U.S.\$ 50 billion or more in U.S. non-branch assets, such as Deutsche Bank, is required to establish or designate a separately capitalized top-tier U.S. intermediate holding company (an "IHC") that would hold substantially all of the FBO's ownership interests in its U.S. subsidiaries. The Federal Reserve Board may permit an FBO subject to the U.S. IHC requirement to establish or designate multiple U.S. IHCs upon written request. Deutsche Bank has designated two IHCs: DB USA Corporation and DWS USA Corporation. DWS USA Corporation is a subsidiary of DWS Group GmbH & Co. KGaA, which is approximately 80 % owned by Deutsche Bank and holds the bank's Asset Management division and subsidiaries. Each IHC is subject, on a consolidated basis, to the risk-based and leverage capital requirements under the U.S. Basel 3 capital framework, capital planning and stress testing requirements, U.S. liquidity buffer requirements and other enhanced prudential standards comparable to those applicable to large U.S. banking organizations. They are also subject to supplementary leverage ratio requirements. The Federal Reserve Board has the authority to examine an IHC, such as DB USA Corporation and DWS USA Corporation, and its subsidiaries, as well as U.S. branches and agencies of FBOs, such as Deutsche Bank's New York branch.

On October 10, 2019, the Federal Reserve Board finalized rules to categorize the U.S. operations of large FBOs based on size, complexity and risk for purposes of tailoring the application of the U.S. enhanced prudential standards (the "Tailoring Rules"). The Tailoring Rules do not significantly change the capital requirements that apply to DB USA Corporation or DWS USA Corporation although they provide the option to comply with certain simplifications to the capital requirements. However, the Tailoring Rules provide modest relief for Deutsche Bank's U.S. IHCs with respect to applicable liquidity requirements so long as the bank's IHCs' combined weighted short term wholesale funding remains below \$75 billion.

As a bank holding company with assets of U.S.\$ 250 billion or more, Deutsche Bank AG is required under Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, as amended (the "Dodd-Frank Act"), and the implementing regulations thereunder to prepare and submit to the Federal Reserve Board and the Federal Deposit Insurance Corporation (FDIC) either a full or targeted resolution plan (the "U.S. Resolution Plan") on a timeline prescribed by such agencies. The U.S. Resolution Plan must demonstrate that Deutsche Bank AG has the ability to execute a strategy for the orderly resolution of its designated U.S. material entities and operations. For foreign-based companies subject to these resolution planning requirements such as Deutsche Bank AG, the U.S. Resolution Plan relates only to subsidiaries, branches, agencies and businesses that are domiciled in or whose activities are carried out in whole or in material part in the United States. Deutsche Bank's U.S. Resolution Plan describes the single point of entry strategy for Deutsche Bank's U.S. material entities and operations and prescribes that DB USA Corporation, one of the bank's IHCs, would provide liquidity and capital support to its U.S. material entity subsidiaries and ensure their solvent wind-down outside of applicable resolution proceedings.

By December 17, 2021, Deutsche Bank filed its first 'targeted' 2021 U.S. Resolution Plan, which described the core elements of Deutsche Bank's U.S. resolution strategy — such as capital, liquidity, and recapitalization strategies — as well as how Deutsche Bank has integrated lessons learned from its response to the COVID-19 pandemic into its resolution planning process. On December 16, 2022, the Federal Reserve Board and the FDIC announced the results of their review of Deutsche Bank's 2021 U.S. Resolution Plan, as well as those of other banks and did not find any shortcomings or deficiencies in Deutsche Bank's plan. In their feedback letter to Deutsche Bank, the agencies noted areas where further progress will help improve resolvability, which Deutsche Bank must address in its next full resolution plan submission, which is due on July 1, 2024.

If the Federal Reserve Board and the FDIC were to jointly deem Deutsche Bank's U.S. Resolution Plan not credible and Deutsche Bank failed to remediate any deficiencies in the required timeframe prescribed by the Federal Reserve Board and FDIC, these agencies could impose restrictions on Deutsche Bank or require the restructuring or reorganization of businesses, legal entities, operational systems and/or intra-company transactions which could negatively impact the bank's operations and/or strategy. Additionally, the Federal Reserve Board and FDIC could also subject Deutsche Bank to more stringent capital, leverage or liquidity requirements, or require Deutsche Bank to divest certain assets or operations.

DB USA Corporation and DWS USA Corporation are each subject, on an annual basis, to the Federal Reserve Board's supervisory stress testing and capital requirements. DB USA Corporation and DWS USA Corporation are also subject to the Federal Reserve's Comprehensive Capital Analysis and Review (CCAR), which is an annual supervisory exercise that assesses the capital positions and planning practices of large bank holding companies and IHCs. On June 23, 2022, the Federal Reserve Board publicly released the results of its annual supervisory stress test, which showed that DB USA Corporation and DWS USA Corporation would continue to have capital levels above minimum requirements even under the stress test's severely adverse scenario. DB USA Corporation and DWS USA Corporation submitted their annual capital plans in April 2022 and will make their next capital plan submissions to the Federal Reserve Board in April 2023. If the Federal Reserve Board were to object to these capital plans the bank could be required to increase capital or restructure businesses in ways that may negatively impact the bank's operations and strategy or could be subject to restrictions on growth in the United States.

Following amendments in 2020, the CCAR process combines the CCAR quantitative assessment and the buffer requirements in the Federal Reserve Board's capital rules to create an integrated capital buffer requirement. The amendments eliminated the quantitative and qualitative 'pass/fail' assessments from CCAR and modified the static capital conservation buffer to incorporate an institution-specific stress capital buffer (SCB), which is floored at 2.5 %. The stress capital buffer equals (i) a bank holding company's projected peak-to-trough decline in common equity tier 1 capital under the annual CCAR supervisory severely adverse stress testing scenario prior to any planned capital actions, plus (ii) one year of planned common stock dividends. The stress capital buffer will be reset each year. On August 4, 2022, the Federal Reserve Board announced an SCB for each CCAR firm based on 2022 supervisory stress testing results, which for DB USA Corporation was 4.5 % and for DWS USA Corporation was 8.7 %. This SCB became effective October 1, 2022 and will remain in effect until September 30, 2023, at which point the size of the SCB for each of Deutsche Bank's IHCs will be recalibrated based on the results of the 2023 stress tests, which are expected to be released in June 2023.

Large U.S. bank holding companies and certain of their subsidiary depository institutions are subject to liquidity coverage ratio (LCR) requirements that are generally consistent with the Basel Committee's revised Basel 3 liquidity standards. DB USA Corporation, DWS USA Corporation and Deutsche Bank's principal U.S. bank subsidiary, Deutsche Bank Trust Company Americas (DBTCA), are subject to the LCR requirements. The Tailoring Rules reduced the LCR requirements applicable to these entities from 100 to 85 % coverage of net outflows over a projected 30-day period.

On October 20, 2020, the Federal Reserve Board and other U.S. regulators finalized rules implementing the second element of the Basel 3 liquidity framework, the net stable funding ratio (NSFR). Under the Tailoring Rules, DB USA Corporation, DWS USA Corporation and DBTCA are subject to an 85 percent NSFR so long as the IHCs' combined weighted short term wholesale funding remains below \$75 billion. Effective July 1, 2021, these firms are required to calculate the NSFR on a daily basis. Beginning in 2023, these firms will be required to publicly report NSFR information on a periodic basis.

On December 15, 2016, the Federal Reserve Board adopted final rules that implement the FSB's TLAC standard in the United States. The final rules require, among other things, U.S. IHCs of non-U.S. G-SIBs, including Deutsche Bank's IHCs, DB USA Corporation and DWS USA Corporation, to maintain a minimum amount of TLAC, and separately require them to maintain a minimum amount of long-term debt meeting certain requirements.

U.S. rules and interpretations, including those described above, could cause the bank to reduce assets held in the United States, or to inject capital and/or liquidity into or otherwise change the structure of the Group's U.S. operations, and could also restrict the ability of the U.S. subsidiaries to pay dividends or the amount of such dividends. To the extent that the Group is required to reduce operations in the United States or deploy capital or liquidity in the United States that could be deployed more profitably elsewhere, these requirements could have an adverse effect on the Group's business, financial condition and results of operations.

Any increased capital or liquidity requirements, including those described above, could have adverse effects on the Group's business, financial condition and results of operations, as well as on perceptions in the market of its stability, particularly if any such requirement and results in the Group having to raise capital at a time when the bank or the financial markets are distressed, or take other measures to increase liquidity in certain jurisdictions due to local requirements. The measures required or the bank might find necessary to take in response to these shifting local requirements may be inconsistent with, and hinder the achievement of, its strategic goals. In addition, if these regulatory requirements must be implemented more quickly than currently foreseen, the Group may decide that the quickest and most reliable path to compliance is to reduce the level of assets on its balance sheet, dispose of assets or otherwise segregate certain activities or reduce or close down certain business lines. The effects on capital raising efforts in such a case could be amplified due to the expectation that Deutsche Bank's competitors, at least those subject to the same or similar capital requirements, would likely also be required to raise capital at the same time. Moreover, some of Deutsche Bank's competitors, particularly those outside the European Union, may not face the same or similar regulations, which could put the bank at a competitive disadvantage.

In addition to these regulatory initiatives, market sentiment may encourage financial institutions such as Deutsche Bank to maintain significantly more capital, liquidity and loss-absorbing capital instruments than the regulatory-mandated minima, which could exacerbate the effects described above or, if the bank does not increase its capital to the encouraged levels, could lead to the perception in the market that the bank is undercapitalized relative to peers.

It is unclear whether the U.S. capital and other requirements described above, as well as similar developments in other jurisdictions, could lead to a fragmentation of supervision of global banks that could adversely affect the Group's reliance on regulatory waivers allowing the bank to meet capital adequacy requirements, large exposure limits and certain organizational requirements on a consolidated basis only rather than on both a consolidated and non-consolidated basis. Should the Group no longer be entitled to rely on these waivers, the Group would have to adapt and take the steps necessary in order to meet regulatory capital requirements and other requirements on a consolidated as well as a non-consolidated basis, which could result also in significantly higher costs and potential adverse effects on the Group's profitability and dividend paying ability.

Deutsche Bank's regulatory capital and liquidity ratios and its funds available for distributions on its shares or regulatory capital instruments will be affected by business decisions and, in making such decisions, the Group's interests and those of the holders of such instruments may not be aligned, and the bank may make decisions in accordance with applicable law and the terms of the relevant instruments that result in no or lower payments being made on Deutsche Bank shares or regulatory capital instruments.

Deutsche Bank's regulatory capital and liquidity ratios are affected by a number of factors, including decisions the bank makes relating to its businesses and operations as well as the management of its capital position, risk-weighted assets and balance sheet, and external factors, such as regulations regarding the risk weightings of the bank's assets, commercial and market risks or the costs of its legal or regulatory proceedings. While the bank's management is required to take into account a broad range of considerations in managerial decisions, including the interests of the bank as a regulated institution and those of Deutsche Bank's shareholders and creditors, particularly in times of weak earnings and increasing capital requirements, the regulatory requirements to build capital and liquidity may become paramount. Accordingly, in making decisions in respect of capital and liquidity management, the bank is not required to adhere to the interests of the holders of instruments issued that qualify for inclusion in regulatory capital, such as Deutsche Bank's shares or Additional Tier 1 capital instruments. The bank may decide to refrain from taking certain actions, including increasing capital at a time when it is feasible to do so (through securities issuances or otherwise), even if its failure to take such actions would result in a non-payment or a write-down or other recovery- or resolution-related measure in respect of any of its regulatory capital instruments. Deutsche Bank's decisions could cause the holders of such regulatory capital instruments to lose all or part of the value of their investments in these instruments due to the effect on the Group's regulatory capital ratios, and such holders will not have any claim against Deutsche Bank AG relating to such decisions, even if they result in a non-payment or a write-down or other recovery- or resolution-related measure in respect of such instruments it holds.

In addition, the annual profit and distributable reserves, which form an important part of the funds available to pay dividends on shares and make payments on other regulatory capital instruments, as determined in the case of each such instrument by its terms or by operation of law, are calculated on an unconsolidated basis generally in accordance with German accounting rules set forth in the Commercial Code (*Handelsgesetzbuch*). Any adverse change in Deutsche Bank's financial prospects, financial position or profitability, or Deutsche Bank AG's distributable reserves, each as calculated on an unconsolidated basis, may have a material adverse effect on the Group's ability to make dividend or other payments on these instruments. In addition, as part of the implementation of Deutsche Bank's strategy, it may record impairments that reduce the carrying value of subsidiaries on Deutsche Bank AG's unconsolidated balance sheet and reduce profits and distributable reserves. Future impairments or other events that reduce its profit or distributable reserves on an unconsolidated basis could lead the bank to be unable to make such payments in respect of future years in part or at all. In particular, the direct costs of Deutsche Bank's potential settlements of litigation, enforcement and similar matters, especially to the extent in excess of provisions Deutsche Bank has established for them, and their related business impacts, if they occur, could impact such distributable amounts.

In addition, German law places limits on the extent to which annual profits and otherwise-distributable reserves, as calculated on an unconsolidated basis, may be distributed to shareholders or the holders of other regulatory capital instruments, such as Additional Tier 1 capital instruments. The Group's management also has, subject to applicable law, broad discretion under the applicable accounting principles to influence all amounts relevant for calculating funds available for distribution. Such decisions may impact the ability to make dividend or other payments under the terms of the bank's regulatory capital instruments.

European and German legislation regarding the recovery and resolution of banks and investment firms could, if steps were taken to ensure resolvability or resolution measures were imposed on the bank, significantly affect the Group's business operations, and lead to losses for shareholders and creditors.

Germany participates in the SRM, which centralizes at a European level the key competences and resources for managing the failure of any bank in member states of the European Union participating in the banking union. The SRM is based on the SRM Regulation and the BRRD, which was implemented in Germany through the German Recovery and Resolution Act. In addition, the German Resolution Mechanism Act (Abwicklungsmechanismusgesetz) adapted German bank resolution laws to the SRM.

The SRM Regulation and the German Recovery and Resolution Act require the preparation of recovery and resolution plans for banks and grant broad powers to public authorities to intervene in a bank which is failing or likely to fail. For a bank directly supervised by the ECB, such as Deutsche Bank, the Single Resolution Board (referred to as the "SRB") assesses its resolvability and may require legal and operational changes to the bank's structure to ensure its resolvability. In the event that such bank is deemed by the ECB or the SRB as failing or likely to fail and certain other conditions are met, the SRB is responsible for adopting a resolution scheme for resolving the bank pursuant to the SRM Regulation. The European Commission and, to a lesser extent, the Council of the European Union, have a role in endorsing or objecting to the resolution scheme proposed by the SRB. The resolution scheme would be addressed to and implemented by the competent national resolution authorities (in Germany, the BaFin) in line with the national laws implementing the BRRD. Resolution measures that could be imposed upon a bank in resolution may include the transfer of shares, assets or liabilities of the bank to another legal entity, the reduction, including to zero, of the nominal value of shares, the dilution of shareholders or the cancellation of shares outright, or the amendment, modification or variation of the terms of the bank's outstanding debt instruments, for example by way of a deferral of payments or a reduction of the applicable interest rate. Furthermore, certain eligible unsecured liabilities, in particular certain senior "non-preferred" debt instruments specified by the German Banking Act, may be written down, including to zero, or converted into equity (commonly referred to as "bail-in") if the bank becomes subject to resolution.

The SRM is intended to eliminate, or reduce, the need for public support of troubled banks. Therefore, financial public support for such banks, if any, would be used only as a last resort after having assessed and exploited, to the maximum extent practicable, the resolution powers, including a bail-in. The taking of actions to ensure the bank's resolvability or the exercise of resolution powers by the competent resolution authority could materially affect the Group's business operations and lead to a significant dilution of shareholders or even the total loss of shareholders' or creditors' investment.

Other regulatory reforms that have been adopted or proposed – for example, extensive new regulations governing derivatives activities, compensation, bank levies, deposit protection, data protection, investment firms and ESG – may materially increase Deutsche Bank's operating costs and negatively impact its business model.

Beyond capital requirements and the other requirements discussed above, Deutsche bank is affected, or expect to be affected, by various additional regulatory reforms, including, among other things, regulations governing its derivatives activities, compensation, bank levies, deposit protection, data protection, investment firms and ESG.

On August 16, 2012, the EU Regulation on over-the-counter (OTC) derivatives, central counterparties and trade repositories, referred to as European Market Infrastructure Regulation (EMIR), entered into force. EMIR introduced a number of requirements, including clearing obligations for certain classes of OTC derivatives and various reporting and disclosure obligations. EMIR implementation has led and may lead to changes that may negatively impact Deutsche Bank's profit margins. The revised Markets in Financial Instruments Directive (MiFID) and the corresponding Regulation (MiFIR) became applicable to the bank on January 3, 2018 and provide for, among other things, a trading obligation for those OTC derivatives which are subject to mandatory clearing and which are sufficiently standardized. On November 25, 2021, the European Commission published a proposal for a review of the MiFIR (referred to as the "MiFIR Review") that entails amendments to the MiFIR and the MiFID. The proposals in the MiFIR Review, among other things, introduce an EU-wide consolidated tape for each asset class, enhanced transparency requirements for small trades in equities (such as shares) and for non-equities (such as derivatives and bonds), and adjust the scope of the EU share trading obligation and derivatives trading obligation.

In the United States, the Dodd-Frank Act has numerous provisions that affect or may affect operations. Pursuant to regulations implementing provisions of the Dodd-Frank Act, the bank provisionally registered as a swap dealer with the U.S. Commodity Futures Trading Commission (CFTC) and became subject to the CFTC's extensive oversight. Regulation of swap dealers by the CFTC imposes numerous corporate governance, business conduct, capital, margin, reporting, clearing, execution and other regulatory requirements on the bank. It also requires the Group to comply with certain U.S. rules in some circumstances with respect to transactions conducted outside of the United States or with non-U.S. persons. Although the coverage of EMIR and CFTC regulations implementing the Dodd-Frank Act is in many ways similar, certain swaps may be subject to both regulatory regimes to a significant extent.

Additionally, under the Dodd-Frank Act, security-based swaps are subject to a standalone regulatory regime under the jurisdiction of the U.S. Securities and Exchange Commission (SEC). The SEC has implemented rules regarding registration, capital, risk-mitigation techniques, reporting, business conduct standards, trade acknowledgement and verification requirements, and cross-border requirements for security-based swap dealers that are generally similar to the CFTC's rules for swap dealers. These rules generally came into effect in November 2021, the first compliance date for registration of security-based swap dealers. Pursuant to these rules, Deutsche Bank AG is conditionally registered as a security-based swap dealer and are now subject to further regulation of its derivatives business.

Pursuant to these CFTC and SEC regulations, there may be instances where the bank can comply with European and/or German requirements in lieu of complying with the U.S. regulatory requirements. These requirements under the Dodd-Frank Act may adversely affect its derivatives business and make the bank less competitive, especially as compared to competitors not subject to such regulation.

In addition, the CRR/CRD IV legislative package provided for executive compensation reforms including caps on bonuses that may be awarded to "material risk takers" and other employees as defined therein and in the German Banking Act and other applicable rules and regulations such as the Remuneration Regulation for Institutions (*Institutsvergütungsverordnung*). Such restrictions on compensation, including the amendments introduced by the CRR II/CRD V/BRRD II reform package and any guidelines issued by the EBA to further implement them, could put the bank at a disadvantage to its competitors in attracting and retaining talented employees, especially compared to those outside the European Union that are not subject to these caps and other constraints.

Bank levies have been introduced in some countries including, among others, Germany and the United Kingdom. Deutsche Bank paid € 762 million for bank levies in 2022, € 553 million in 2021 and € 633 million in 2020. Also, the bank is required to contribute substantially to the Single Resolution Fund under the SRM (which is intended to reach by the end of 2023 a target level of 1 % of insured deposits of all banks in member states participating in the SRM) and the statutory deposit guarantee and investor compensation schemes under the recast European Union directive on deposit guarantee schemes (DGS Directive) and the European Union directive on investor compensation schemes. The DGS Directive defines a 0.8 % target level of prefunding by July 3, 2024 (similar to resolution funds), which has significantly increased the costs of the statutory deposit protection scheme. Deutsche Bank also participates in the voluntary deposit protection provided by the private banks in Germany through the Deposit Protection Fund (*Einlagensicherungsfonds*) which is funded through contributions by its members. While the total impact of future levies cannot currently be quantified, it may have a material adverse effect on the Group's business, financial condition and results of operations in future periods. Failure of banks, resolution measures and a decline of the value of the assets held by the SRM by the relevant DGS can cause an increase of contributions in order to replenish the shortfall.

Deutsche Bank is subject to the General Data Protection Regulation (GDPR) which has increased its regulatory obligations in connection with the processing of personal data, including requiring compliance with the GDPR's data protection principles, the increased number of data subject rights and strict data breach notification requirements. The GDPR grants broad enforcement powers to supervisory authorities, including the potential to levy significant fines for non-compliance and provides for a private right of action for individuals who are affected by a violation of the GDPR. Compliance with the GDPR requires investment in appropriate technical and organizational measures and the bank may be required to devote significant resources to data protection on an ongoing basis. In the event that the bank is found to have not met the standards required by the GDPR, the bank may incur damage to its reputation and the imposition by data protection supervisory authorities of significant fines or restrictions on its ability to process personal data, and the bank may be required to defend claims for compensation brought by affected individuals, all of which could have a material adverse effect on the bank.

On November 27, 2019, the European Parliament and the Council adopted the Investment Firm Regulation and the Investment Firm Directive, which introduced substantive regulatory changes (including to the calculation of capital requirements) in respect of investment firms, such as the Group's subsidiary DWS. The Investment Firm Regulation and the Investment Firm Directive (as implemented into German law) are in full force since June 26, 2021.

A number of jurisdictions where the bank is active are starting to discuss rules related to environmental, social and governance ("ESG") aspects of the bank's business and exposure. It is currently difficult to estimate how these rules could impact the bank.

Scrutiny of regulators and courts in respect of the protection of retail customers has increased in particular with respect to the enforceability and transparency of standard business terms and compensation for alleged damages.

In the recent past, regulators and courts have put further emphasis on the protection of retail customers. Examples of this are (i) the BaFin's general order of June 21, 2021, pursuant to which credit institutions must inform customers of certain invalid interest rate adjustment clauses in their standard business terms; (ii) the German Federal Court of Justice's (BGH) decision of April 27, 2021, according to which typical clauses in the standard business terms of banks providing for deemed consent to proposed amendments if the customer does not object within a certain period are unenforceable; and (iii) the FX mortgages loan cases in Poland, which constitute an industry-wide and highly disputed and litigated issue, where courts have found that certain mortgage loan agreements in foreign currencies include unfair conditions and are therefore unenforceable. Customer restitution practices in respect of such matters have varied significantly across the industry, and if the bank's practices differ from accepted norms, the Group may be subject to civil or regulatory claims. These matters may result in the imposition of additional costs to the bank or require the Group to reimburse or pay damages to clients.

Risks Relating to Environmental, Social and Governance (ESG)-Related Changes

The impacts of rising global temperatures, and the enhanced focus on climate change and the transition to a "net-zero" economy from society, the regulators and the banking sector, have led to new sources of financial and non-financial risks. These include the physical risks arising from extreme weather events which are growing in frequency and severity, as well as transition risks as carbon-intensive sectors are faced with higher taxation, reduced demand and potentially restricted access to financing, and risks relating to the portrayal of ESG aspects of activities. These risks can impact Deutsche Bank across a broad range of financial and non-financial risk types.

Deutsche Bank operates in many regions around the world where its businesses, and the activities of its clients and customers, could be impacted by climate change. Climate change could manifest as a financial risk to Deutsche Bank either through changes in the physical climate or from the process of transitioning to a low-carbon economy, including further changes in climate policy or in the regulation of financial institutions with respect to risks posed by climate change.

Climate-related physical risks include both acute weather events and chronic shifts in the climate. Potential physical risks from climate change may include altered distribution and intensity of rainfall, prolonged droughts or flooding, increased frequency of wildfires, rising sea levels, or a rising heat index. Transition risks arise from the process of adjusting to a low-carbon economy. In addition to possible further changes in climate policy and financial regulation, potential transition risks may include economic and other changes engendered by the development of low-carbon technological advances and/or changes in consumer preferences towards low-carbon goods and services. Transition risks could be further accelerated by the occurrence of changes in the physical climate. These climate-related physical risks and transition risks could have a financial impact on Deutsche Bank both directly on its business and operations and as a result of material adverse impacts to its clients and customers, inter alia, through declines in asset values, reduced availability of insurance, significant interruptions to business operations, and negative consequences to business models, and the need to make changes in response to those consequences.

Furthermore, financial institutions are facing increased scrutiny on climate and ESG-related issues from governments, regulators, shareholders and other bodies (including non-governmental organizations), leading to reputational risks if the bank is not seen to support the transition to a lower carbon economy, and to protect biodiversity and human rights. Deutsche Bank is also required to review and further develop its ESG risk management frameworks in alignment with emerging regulatory guidance and to ensure that the bank accurately portrays the ESG aspects of its activities. There is a lack of consistent and comprehensive ESG data and methodologies available today which means that the bank has to rely on proxy estimates and qualitative approaches when assessing the risks to its balance sheet, which introduces a high degree of uncertainty into climate-related disclosures. This increases the risk that third parties may assert that the bank's sustainability-related disclosures constitute so-called "greenwashing". In addition to the reputational risks associated with such allegations, competent supervisory authorities and law enforcement agencies may commence investigations based on such allegations, as was recently the case with our subsidiary DWS which has received requests for information from various regulatory and law enforcement agencies concerning certain ESG related matters.

Deutsche Bank is committed to managing its business activities and operations in a sustainable manner, including aligning portfolios with net zero emissions by 2050. The bank continues to develop and implement its approach to environmental risk assessments and management in order to promote the integration of environmental-related factors across its business activities. This includes the ability to identify, monitor and manage risks and to conduct regular scenario analysis and stress testing. Rapidly changing regulatory as well as stakeholder demands, combined with significant focus by stakeholders, may adversely affect its businesses if it fails to adopt such demands or appropriately implement its plans.

Risks Relating to the bank's Internal Control Environment

A robust and effective internal control environment and adequate infrastructure (comprising people, policies and procedures, controls testing and IT systems) are necessary to ensure that Deutsche Bank conducts its business in compliance with the laws, regulations and associated supervisory expectations applicable to the bank. The bank has identified the need to strengthen its internal control environment and infrastructure and has embarked on initiatives to accomplish this. If these initiatives are not successful or proceed too slowly, Deutsche Bank's reputation, regulatory position and financial condition may be materially adversely affected, and its ability to achieve the bank's strategic ambitions may be impaired.

Deutsche Bank's businesses are highly dependent on its ability to maintain a robust and effective internal control environment. This is needed for the bank to process and monitor, on a daily basis, a wide variety of transactions, many of which are highly complex and occur at high speeds, volumes and frequencies, and across numerous and diverse markets and currencies. Such a robust and effective control environment is in turn dependent on the sufficiency of the bank's infrastructure to support that environment. This infrastructure consists broadly of internal policies and procedures, testing protocols, and the IT systems and employees needed to enforce and enable them. An effective control environment is dependent on infrastructure systems and procedures that cover the processing and settling of transactions; the valuation of assets; the identification, monitoring, aggregation, measurement and reporting of risks and positions against various metrics; the evaluation of counterparties and customers for legal, regulatory and compliance purposes; the escalation of reviews; and the taking of mitigating and remedial actions where necessary. They are also critical for regulatory reporting and other data processing and compliance activities.

Both the internal control environment and the infrastructure that underlies it fall short in a number of areas of Deutsche Bank's standards for completeness and comprehensiveness and are not well integrated across the bank. The Group's IT infrastructure, in particular, is fragmented, with numerous distinct platforms, many of which need significant upgrades, in operation across the bank. The Group's business processes and the related control systems often require manual procedures and actions that increase the risks of human error and other operational problems that can lead to delays in reporting information to management and to the need for more adjustments and revisions than would be the case with more seamlessly integrated and automated systems and processes. As a result, it is often difficult and labor-intensive for the bank to obtain or provide information of a consistently high quality and on a timely basis to comply with regulatory reporting and other compliance requirements or to meet regulatory expectations on a consistent basis and, in certain cases, to manage the Group's risk comprehensively. Furthermore, it often takes intensive efforts to identify, when possible, inappropriate behavior by staff and attempts by third parties to misuse the Group's services as a conduit for prohibited activities, including those relating to anti-financial crime laws and regulation.

In addition, Deutsche Bank may not always have the personnel with the appropriate experience, seniority and skill levels to compensate for shortcomings in its processes and infrastructure, or to identify, manage or control risks, and it often has been difficult to attract and retain the requisite talent. This has impacted the bank's ability to remediate existing weaknesses and manage the risks inherent in its activities. Additionally, attrition in positions key to improving the Group's control environment remains a risk. Furthermore, engagement of third-party service providers may not be sufficient to address the bank's staffing issues in these areas or the underlying shortcomings themselves.

Against this backdrop, regulators, the Management Board and the Group Audit function have increasingly and more intensively focused on internal controls and infrastructure through numerous formal reviews and audits of the Group's operations. These reviews and audits have identified various areas for improvement relating to a number of elements of the bank's control environment and infrastructure. These include the infrastructure relating to transaction capturing and recognition, classification of assets, asset valuation frameworks, models, data and process consistency, information security, software license management, payment services, risk identification, measurement and management and other processes required by laws, regulations, and supervisory expectations. They also include regulatory reporting, anti-money laundering (AML), transaction monitoring, "know-your-customer" (KYC), sanctions and embargoes, market conduct and other internal processes that are aimed at preventing use of the bank's products and services for the purpose of committing or concealing financial crime.

The bank's principal regulators, including the BaFin, the ECB and the Federal Reserve Board, have also conducted numerous reviews focused on the bank's internal controls and the related infrastructure. These regulators have required the bank formally to commit to remediate its AML and other weaknesses, including the fragmented and manual nature of its infrastructure. For example, on September 21, 2018, the BaFin issued an order requiring the bank to implement measures on specified timelines over the coming months and years to improve its control and compliance infrastructure relating to AML and, in particular, the KYC processes in certain of the bank's businesses. Local regulators in other countries in which the Group does business also review the sufficiency of the Group's control environment and infrastructure with respect to their jurisdictions. While the overall goals of the various prudential regulators having authority over the bank in the many places in which it does business are broadly consistent, and the general themes of deficiencies in internal controls and the supporting infrastructure are similar, the regulatory frameworks applicable to the bank in the area of internal controls are generally applicable at a national or EU-wide level and are not always consistent across the jurisdictions in which the Group operates around the world. This adds complexity and cost to its efforts to reduce fragmentation and put in place automated systems that communicate seamlessly and quickly with one another.

In order to improve in the areas discussed above, the bank is undertaking several major initiatives to enhance the efficacy of the transaction processing environment, strengthen its controls and infrastructure, manage non-financial risks and enhance the skill set of personnel. Deutsche Bank believes that these initiatives will better enable it to avoid the circumstances that have resulted in many of the litigations and regulatory and enforcement investigations and proceedings to which the bank has been subject, and will improve its ability to comply with laws and regulations and meet supervisory expectations. In particular, making efforts to reduce the complexity of the Group's business and to integrate and automate processes and business and second-line controls. The bank has also exited certain businesses and high-risk countries, selectively off-boarded a number of clients and worked to strengthen its compliance culture and control functions. However, the Group may be unable to complete these initiatives as quickly as it intends or regulators demand, and its efforts may be insufficient to remediate existing deficiencies and prevent future deficiencies or to result in fewer litigations or regulatory and enforcement investigations, proceedings and criticism in the future. The Group may also, when faced with the considerable expense of these initiatives, fail to provide sufficient resources for them quickly enough or at all or underestimate the extent of resource requirements.

The slow pace of the bank's remediation efforts and progress on achieving significant and durable improvements in the areas discussed above, may result in regulatory action of the type that has been taken against other financial institutions whose progress regulators have deemed insufficient or too slow. If the bank is unable to significantly improve its infrastructure and control environment in a timely manner, the bank may be subject to fines or penalties, as well as to regulatory intervention in aspects of its businesses. For example, the Group might feel pressure or be required by regulators to reduce its exposure to or terminate certain kinds of products or businesses, counterparties or regions, which could, depending on the extent of such requirement, significantly challenge its ability to operate profitably under the current business model.

In particular, the bank is engaged in ongoing regulatory discussions to resolve matters concerning adherence to prior orders and settlements related to sanctions and embargoes and AML compliance, and remedial agreements and obligations related to risk management issues.

Regulators can also impose capital surcharges, requiring capital buffers in addition to those directly required under the regulatory capital rules applicable to the bank, to reflect the additional risks posed by deficiencies in its control environment. In extreme cases, regulators can suspend the bank's permission to operate in the businesses and regions within their jurisdictions or require extensive and costly remedial actions. Furthermore, implementation of enhanced infrastructure and controls may result in higher-than-expected costs of regulatory compliance that could offset or exceed efficiency gains or significantly affect the bank's profitability. Any of these factors could affect the Group's ability to implement its strategy in a timely manner or at all.

The BaFin has ordered the bank to improve its control and compliance infrastructure relating to anti-money laundering and know-your-client processes, and appointed a special representative to monitor these measures' implementation. Deutsche Bank's results of operations, financial condition and reputation could be materially and adversely affected if the bank is unable to significantly improve its infrastructure and control environment by the set deadline.

The BaFin ordered Deutsche Bank in September 2018 to take appropriate internal safeguards and comply with general due diligence obligations to prevent money laundering and terrorist financing, in February 2019 to review its group-wide risk management processes in correspondent banking and adjust them where necessary, and in April 2021 to adopt further appropriate internal safeguards and comply with due diligence obligations, with regards to regular client file reviews. This expansion also applies to correspondent relationships and transaction monitoring. On September 28, 2022, BaFin ordered Deutsche Bank AG to take specific measures aimed at preventing money laundering and terrorist financing in order to implement the orders that BaFin issued on September 21, 2018 and February 15, 2019. While the order only requires Deutsche Bank to adhere to its self-imposed remediation deadlines and no new obligations or findings were raised against Deutsche Bank, BaFin may impose financial penalties in case of non-compliance with these measures. The BaFin has appointed a special representative to monitor the implementation of the ordered measures as well as to assess and report on the progress of the implementation to the BaFin.

The bank's AML and KYC processes and controls aimed at preventing misuse of its products and services to commit financial crime, continue to be subject of regulatory reviews, investigations, and enforcement actions in several jurisdictions. The bank continually seeks to enhance the efficacy of its internal control environment and improve its infrastructure to revised regulatory requirements and to close gaps identified by the bank and/or by regulators and monitors.

If Deutsche Bank is unable to significantly improve its infrastructure and control environment by the set deadlines, the Group's results of operations, financial condition and reputation could be materially and adversely affected. Regulators can impose fines or require the bank to reduce its exposure to or terminate certain kinds of products or businesses or relationships with counterparties or regions. The bank may also face additional legal proceedings, investigations or regulatory actions in the future, including in other jurisdictions with material impact on the bank's business and profitability. These could, depending on the extent of any resulting requirements, significantly challenge the bank's reputation and its ability to operate profitably under its current business model.

Risks Relating to Litigation, Regulatory Enforcement Matters, Investigations and Tax Examinations

Deutsche Bank operates in a highly and increasingly regulated and litigious environment, potentially exposing the bank to liability and other costs, the amounts of which may be substantial and difficult to estimate, as well as to legal and regulatory sanctions and reputational harm.

The financial services industry is among the most highly regulated industries. The Group's operations throughout the world are regulated and supervised by the central banks and regulatory authorities in the jurisdictions in which it operates. In recent years, regulation and supervision in a number of areas has increased, and regulators, law enforcement authorities, governmental bodies and others have sought to subject financial services providers to increasing oversight and scrutiny, which in turn has led to additional regulatory investigations or enforcement actions which are often followed by civil litigation. There has been a steep escalation in the severity of the terms which regulatory and law enforcement authorities have required to settle legal and regulatory proceedings against financial institutions, with settlements in recent years including unprecedented monetary penalties as well as criminal sanctions. As a result, it may continue to be subject to increasing levels of liability and regulatory sanctions, and may be required to make greater expenditures and devote additional resources to addressing these liabilities and sanctions. Regulatory sanctions may include status changes to local licenses or orders to discontinue certain business practices.

The bank and its subsidiaries are involved in various litigation proceedings, including civil class action lawsuits, arbitration proceedings and other disputes with third parties, as well as regulatory proceedings and investigations by both civil and criminal authorities in jurisdictions around the world. The Group expects that the costs arising from the resolution of litigation, enforcement and similar matters pending against the Group to continue to be significant in the near to medium term and to adversely affect its business, financial condition and results of operations. Litigation and regulatory matters are subject to many uncertainties, and the outcome of individual matters is not predictable with assurance. The bank may settle litigation or regulatory proceedings prior to a final judgment or determination of liability. The bank may do so for a number of reasons, including to avoid the cost, management efforts or negative business, regulatory or reputational consequences of continuing to contest liability, even when the bank believes it has valid defenses to liability. The Group may also do so when the potential consequences of failing to prevail would be disproportionate to the costs of settlement. Furthermore, it may, for similar reasons, reimburse counterparties for their losses even in situations where the Group does not believe it is compelled to do so. The financial impact of legal risks might be considerable but may be difficult or impossible to estimate and to quantify, so that amounts eventually paid may exceed the amount of provisions made or contingent liabilities assessed for such risks.

Actions currently pending against Deutsche Bank or its current or former employees may not only result in judgments, settlements, fines or penalties, but may also cause substantial reputational harm to the bank. The risk of damage to the Group's reputation arising from such proceedings is also difficult or impossible to quantify.

Regulators have increasingly sought admissions of wrongdoing in connection with settlement of matters brought by them. This could lead to increased exposure in subsequent civil litigation or in consequences under so-called "bad actor" laws, in which persons or entities determined to have committed offenses under some laws can be subject to limitations on business activities under other laws, as well as adverse reputational consequences. In addition, the U.S. Department of Justice (DOJ) conditions the granting of cooperation credit in civil and criminal investigations of corporate wrongdoing on the company involved having provided to investigators all relevant facts relating to the individuals responsible for the alleged misconduct. This policy may result in increased fines and penalties if the DOJ determines that that bank has not provided sufficient information about applicable individuals in connection with an investigation. Other governmental authorities could adopt similar policies.

In addition, the financial impact of legal risks arising out of matters similar to some of those the bank faces have been very large for a number of participants in the financial services industry, with fines and settlement payments greatly exceeding what market participants may have expected and, as noted above, escalating steeply in recent years to unprecedented levels. The experience of others, including settlement terms, in similar cases is among the factors the bank takes into consideration in determining the level of provisions the Group maintains in respect of these legal risks. Developments in cases involving other financial institutions in recent years have led to greater uncertainty as to the predictability of outcomes and could lead the Group to add provisions. Moreover, the costs of the bank's investigations and defenses relating to these matters are themselves substantial. Further uncertainty may arise as a result of a lack of coordination among regulators from different jurisdictions or among regulators with varying competencies in a single jurisdiction, which may make it difficult for the bank to reach concurrent settlements with each regulator. Should the bank be subject to financial impacts arising out of litigation and regulatory matters to which the bank is subject in excess of those it has calculated in accordance with its expectations and the relevant accounting rules, provisions in respect of such risks may prove to be materially insufficient to cover these impacts. This could have a material adverse effect on the Group's results of operations, financial condition or reputation as well as on the bank's ability to maintain capital, leverage and liquidity ratios at levels expected by market participants and regulators. In such an event, the Group could find it necessary to reduce its risk-weighted assets (including on terms disadvantageous to the bank) or substantially cut costs to improve these ratios, in an amount corresponding to the adverse effects of the provisioning shortfall.

The Group has previously been the subject of industry-wide investigations by regulatory and law enforcement authorities relating to interbank and dealer offered rates, and is currently the subject of civil actions in this area. Due to a number of uncertainties, including those related to the high profile of the matters and other banks' settlement negotiations, the eventual outcome of these matters is unpredictable, and may materially and adversely affect the Group's results of operations, financial condition and reputation.

Deutsche Bank has responded to requests for information from, and cooperated with, various regulatory and law enforcement authorities in connection with industry-wide investigations concerning the setting of the London Interbank Offered Rate (LIBOR), Euro Interbank Offered Rate (EURIBOR), Tokyo Interbank Offered Rate (TIBOR) and other interbank and dealer offered rates.

From 2013 through 2017, Deutsche Bank entered into settlements with the European Commission, the DOJ, the CFTC, the UK Financial Conduct Authority (FCA), the DFS and other regulators with respect to interbank and dealer offered rates matters. Other investigations of Deutsche Bank concerning the setting of various interbank and/or dealer offered rates remain ongoing. The factual admissions made in connection with these settlements could make it difficult for the bank to defend against pending and future claims.

In addition, Deutsche Bank is party to seven U.S. civil actions concerning alleged manipulation relating to the setting of various interbank and/or dealer offered rates, as well as actions pending in each of the UK, Israel, Argentina and Spain. Most of the civil actions, including putative class actions, are pending in the U.S. District Court for the Southern District of New York (SDNY), against the bank and numerous other defendants. All but two of the U.S. civil actions were filed on behalf of parties who allege losses as a result of manipulation relating to the setting of U.S. dollar LIBOR. The two U.S. civil actions pending against the bank that do not relate to U.S. dollar LIBOR were also filed in the SDNY, and include one consolidated action concerning Pound Sterling (GBP) LIBOR and one action concerning Swiss franc (CHF) LIBOR.

Deutsche Bank cannot predict the effect on the bank of the interbank and dealer offered rates matters, which could include damages from private litigation for which it may be liable.

Deutsche Bank is currently involved in civil proceedings in connection with its voluntary takeover offer for the acquisition of all shares of Postbank. The extent of the bank's financial exposure to this matter could be material, and the bank's reputation may be harmed.

On September 12, 2010, Deutsche Bank announced the decision to make a voluntary takeover offer for the acquisition of all shares in Deutsche Postbank AG (Postbank). On October 7, 2010, the bank published its official takeover offer and offered Postbank shareholders a consideration of € 25 for each Postbank share. This offer was accepted for a total of approximately 48.2 million Postbank shares.

In November 2010, a former shareholder of Postbank, Effecten-Spiegel AG, which had accepted the takeover offer, brought a claim against Deutsche Bank alleging that the offer price was too low and was not determined in accordance with the applicable German laws. The plaintiff alleges that Deutsche Bank had been obliged to make a mandatory takeover offer for all shares in Postbank, at the latest, in 2009, as the voting rights of Deutsche Post AG in Postbank had to be attributed to Deutsche Bank pursuant to Section 30 of the German Takeover Act. Based thereon, the plaintiff alleges that the consideration offered by Deutsche Bank for the share in Postbank in the 2010 voluntary takeover offer needed to be raised to € 57.25 per share.

The Regional Court Cologne (*Landgericht*) dismissed the claim in 2011 and the Cologne appellate court dismissed the appeal in 2012. The Federal Court set this judgment aside and referred the case back to the Cologne appellate court to take evidence on certain allegations of the plaintiff.

Starting in 2014, additional former shareholders of Postbank, who accepted the 2010 tender offer, brought similar claims as Effecten-Spiegel AG against Deutsche Bank which are pending with the Regional Court Cologne and the Higher Regional Court of Cologne, respectively. On October 20, 2017, the Regional Court Cologne handed down a decision granting the claims in a total of 14 cases which were combined in one proceeding. The Regional Court Cologne took the view that Deutsche Bank was obliged to make a mandatory takeover offer already in 2008 so that the appropriate consideration to be offered in the takeover offer should have been € 57.25 per Postbank share (instead of € 25). The additional consideration per share owed to shareholders which have accepted the takeover offer would thus amount to € 32.25. Deutsche Bank appealed this decision and the appeal was assigned to the 13th Senate of the Higher Regional Court of Cologne, which also heard the appeal of Effecten-Spiegel AG.

On December 16, 2020, the Higher Regional Court Cologne handed down a decision and fully dismissed the claims of Effecten-Spiegel AG. Further, in a second decision handed down on December 16, 2020, the Higher Regional Court Cologne allowed the appeal of Deutsche Bank against the decision of the Regional Court Cologne dated October 20, 2017 and dismissed all related claims of the relevant plaintiffs. The Higher Regional Court Cologne granted leave to appeal both decisions to the German Federal Court (*Bundesgerichtshof*) and all relevant plaintiffs lodged their respective appeals with the Federal Court by February 2021. On December 13, 2022, the German Federal Court announced its decision, setting aside the judgments of the Higher Regional Court of Cologne and remanding the cases back to the Higher Regional Court.

The Group has been served with a large number of additional lawsuits filed against Deutsche Bank shortly before the end of 2017, almost all of which are now pending with the Regional Court Cologne. Some of the new plaintiffs allege that the consideration offered by Deutsche Bank for the shares in Postbank in the 2010 voluntary takeover should be raised to € 64.25 per share.

The claims for payment against Deutsche Bank in relation to these matters total almost € 700 million (excluding interest).

In September 2015, former shareholders of Postbank filed in the Regional Court Cologne shareholder actions against Postbank to set aside the squeeze-out resolution taken in the shareholders meeting of Postbank in August 2015 (actions for avoidance). Among other things, the plaintiffs alleged that Deutsche Bank was subject to a suspension of voting rights with respect to its shares in Postbank based on the allegation that Deutsche Bank failed to make a mandatory takeover offer. The squeeze out is final and the proceeding itself has no reversal effect, but may result in damage payments. The claimants refer to legal arguments similar to those asserted in the Effecten-Spiegel proceeding described above. In a decision on October 20, 2017, the Regional Court Cologne declared the squeeze-out resolution to be void. The court, however, did not rely on a suspension of voting rights due to an alleged failure by Deutsche Bank to make a mandatory takeover offer, but argued that Postbank violated information rights of Postbank shareholders in Postbank's shareholders meeting in August 2015. Postbank has appealed this decision. On May 15, 2020 DB Privat- und Firmenkundenbank AG (legal successor of Postbank due to a merger in 2018) was merged into Deutsche Bank AG. On July 3, 2020 Deutsche Bank AG withdrew the appeal as regards the actions for avoidance because efforts and costs to pursue this appeal became disproportionate to the minor remaining economic importance of the case considering that the 2015 squeeze-out cannot be reversed. As a consequence, the first instance judgement which found that Postbank violated the information rights of its shareholders in the shareholders' meeting became final.

The legal question of whether Deutsche Bank had been obliged to make a mandatory takeover offer for all Postbank shares prior to its 2010 voluntary takeover may also impact two pending appraisal proceedings (*Spruchverfahren*). These proceedings were initiated by former Postbank shareholders with the aim to increase the cash compensation offered in connection with the squeeze-out of Postbank shareholders in 2015 and the cash compensation offered and annual compensation paid in connection with the execution of a domination and profit and loss transfer agreement (*Beherrschungs- und Gewinnabführungsvertrag*) between DB Finanz-Holding AG (now DB Beteiligungs-Holding GmbH) and Postbank in 2012.

The applicants in the appraisal proceedings claim that a potential obligation of Deutsche Bank to make a mandatory takeover offer for Postbank at an offer price of € 57.25 should be decisive when determining the adequate cash compensation in the appraisal proceedings. The Regional Court Cologne had originally followed this legal view of the applicants in two resolutions. In a decision dated June 2019, the Regional Court Cologne expressly gave up this legal view in the appraisal proceedings in connection with execution of a domination and profit and loss transfer agreement. According to this decision, the question whether Deutsche Bank was obliged to make a mandatory offer for all Postbank shares prior to its voluntary takeover offer in 2010 shall not be relevant for determining the appropriate cash compensation. It is likely that the Regional Court Cologne will take the same legal position in the appraisal proceedings in connection with the squeeze-out. On October 1, 2020 the Regional Court Cologne handed down a decision in the appraisal proceeding concerning the domination and profit and loss transfer agreement (dated December 5, 2012) according to which the annual compensation pursuant to Section 304 of the German Stock Corporation Act (*jährliche Ausgleichszahlung*) shall be increased by € 0.12 to € 1.78 per Postbank share and the settlement amount pursuant to Section 305 of the German Stock Corporation Act (*Abfindungsbetrag*) shall be increased by € 4.56 to € 29.74 per Postbank share. The increase of the settlement amount is of relevance for approximately 492,000 former Postbank shares whereas the increase of the annual compensation is of relevance for approximately 7 million former Postbank shares. Deutsche Bank as well as the applicants have lodged an appeal against this decision.

The extent of the Group's financial exposure to these matters could be material and the bank's reputation may be harmed.

Deutsche Bank has investigated the circumstances around equity trades entered into by certain clients in Moscow and London and have advised regulatory and law enforcement authorities in several jurisdictions about those trades. In the event that violations of law or regulation are found to have occurred, any resulting penalties against the bank may materially and adversely affect the Group's results of operations, financial condition and reputation.

Deutsche Bank has investigated the circumstances around equity trades entered into by certain clients with the bank in Moscow and London. The total volume of transactions reviewed is significant. The Group's internal investigation of potential violations of law, regulation and policy and into the related internal control environment has concluded, and the bank has assessed the findings identified during the investigation; to date the bank has identified certain violations of its policies and deficiencies in its control environment. The Group has advised regulatory and law enforcement authorities in several jurisdictions (including Germany, Russia, the UK and the United States) of this investigation and have taken disciplinary measures with regard to certain individuals in this matter.

On January 30 and 31, 2017, the DFS and FCA announced settlements with the bank related to their investigations into this matter. The settlements conclude the DFS and the FCA's investigations into the bank's AML control function in its investment banking division, including in relation to the equity trading described above. Under the terms of the settlement agreement with the DFS, Deutsche Bank entered into a consent order and agreed to pay civil monetary penalties of U.S.\$ 425 million and to engage an independent monitor for a term of up to two years. Under the terms of the settlement agreement with the FCA, the Group agreed to pay civil monetary penalties of approximately GBP 163 million. On May 30, 2017, the Federal Reserve announced its settlement with the bank resolving this matter as well as additional AML issues identified by the Federal Reserve. The Group paid a penalty of U.S.\$ 41 million and agreed to submit written remediation plans and programs, and to certain ongoing remedial undertakings. The Group also agreed to retain independent third parties to assess its Bank Secrecy Act/AML program and review certain foreign correspondent banking activity of DBTCA. The bank was also required to submit written remediation plans and is conducting ongoing remediation.

Deutsche Bank continues to cooperate with regulators and law enforcement authorities, including the DOJ which has its own ongoing investigation into these securities trades. In the event that violations of law or regulation are found to have occurred, legal and regulatory sanctions in respect thereof may materially and adversely affect the Group's results of operations, financial condition and reputation.

Deutsche Bank is currently the subject of industry-wide inquiries and investigations by regulatory and law enforcement authorities relating to transactions of clients in German shares around the dividend record dates for the purpose of obtaining German tax credits or refunds in relation to withholding tax levied on dividend payments (so-called cum-ex transactions). In addition, the bank is exposed to potential tax liabilities and to the assertion of potential civil law claims by third parties, e.g. former counterparties, custodian banks, investors and other market participants, including as a consequence of criminal judgements in criminal proceedings in which the Group is not directly involved. The eventual outcome of these matters is unpredictable, and may materially and adversely affect the bank's results of operations, financial condition and reputation.

The Public Prosecutor in Cologne (*Staatsanwaltschaft Köln*, "CPP") has been conducting a criminal investigation since August 2017 concerning two former employees of Deutsche Bank in relation to cum-ex transactions of certain former clients of the bank. Deutsche Bank is a potential secondary participant pursuant to Section 30 of the German Law on Administrative Offences in this proceeding. Deutsche Bank is cooperating with the CPP. At the end of May and beginning of June 2019, the CPP initiated criminal investigations against further current and former employees of Deutsche Bank and five former Management Board members. In July 2020, in the course of inspecting the CPP's investigation file, Deutsche Bank learned that the CPP had further extended its investigation to include further current and former bank personnel, including one former and one then current Management Board member. In October 2022, the CPP conducted a search at Deutsche Bank's offices in Frankfurt and Eschborn. Based on the search warrant the CPP expanded the scope of the investigation and included further current and former Deutsche Bank employees and one additional former Management Board member in the investigation. The investigation is still at an early stage and the scope of the investigation may be further broadened. It is difficult to predict how the proceeding will further develop. Deutsche Bank is a potential secondary participant (*Nebenbeteiligte*) in these proceedings and the proceedings could result in a disgorgement of profits and fines.

In May 2021, Deutsche Bank learned through an information request received by Deutsche Oppenheim Family Office AG (DOAG) as legal successor of Sal. Oppenheim jr. & Cie. AG & Co. KGaA (Sal. Oppenheim) that the CPP in 2021 opened a criminal investigation proceeding in relation to cum-ex transactions against unknown former personnel of Sal. Oppenheim. DOAG provided the requested information on September 13 and October 15, 2021. There is a risk that the proceedings lead to a formal indictment and criminal prosecution of accused individuals. Also, Deutsche Bank and or DOAG could be included in criminal court proceedings as a secondary participant or a party subject to criminal confiscation (*Einziehungsbeteiligte*).

Increased media attention surrounding the cum-ex topic as well as any future criminal judgement that is unfavorable to the bank can create reputational risks. The imposition of fines and the disgorgement of profits or criminal confiscations could have a material adverse effect on the Group's financial condition or results of operations.

The bank is further exposed to the assertion of potential tax and civil law recourse and compensation claims by German tax authorities and third parties.

Deutsche Bank acted as participant in and filed withholding tax refund claims through the electronic refund procedure (*elektronisches Datenträgerverfahren*) on behalf of, inter alia, two former custody clients in connection with their cum-ex transactions. In February 2018, Deutsche Bank received from the German Federal Tax Office (*Bundeszentralamt für Steuern*, "FTO") a demand of approximately € 49 million for tax refunds paid to a former custody client. Deutsche Bank expects to receive a formal notice for the same amount. On December 20, 2019, Deutsche Bank received a liability notice from the FTO requesting payment of € 2.1 million by January 20, 2020 in connection with tax refund claims Deutsche Bank had submitted on behalf of another former custody client. In 2020, Deutsche Bank made the requested payment and filed an objection against the liability notice. On July 28, 2021, Deutsche Bank received a letter from the FTO stating that the revised tax assessment notice dated December 2019 was not a valid administrative act as it could not be served to Deutsche Bank's client due to its liquidation already in 2016. On the same day, FTO issued another liability notice to Deutsche Bank arguing that it issued incorrect tax certificates. On May 30, 2022, Deutsche Bank's objections against the liability notices were rejected. On July 1, 2022, Deutsche Bank filed a claim against this rejection with the Fiscal Court of Cologne (*Finanzgericht Köln*).

As regards civil law claims, The Bank of New York Mellon SA/NV (BNY) – as a parent of two companies acting as depot bank and fund administrator which Deutsche Bank acquired in 2010 and sold to BNY later in 2010 – has informed Deutsche Bank of its intention to assert indemnification claims under a contractual tax indemnity provision for potential cum-ex related tax liabilities incurred by these companies. BNY estimates the potential tax liability to amount to up to € 120 million (excluding interest of 6 % per annum). In November and December 2020, counsel to BNY informed Deutsche Bank that certain BNY entities (among others) have received notices from tax authorities regarding the estimated amount with respect to cum-ex related trades by certain investment funds in 2009 and 2010. BNY has filed objections against the notices. Following receipt of payment orders from tax authorities in the amount of € 60.6 million in relation to one of the investment funds and after consultation with Deutsche Bank, BNY in September 2022 paid € 13.6 million to tax authorities. The remaining € 47 million in relation to that fund were paid by Warburg Invest Kapitalanlagegesellschaft mbH (the investment fund's manager). Further, following receipt of payment orders from tax authorities in the amount of € 11.8 million regarding another one of the investment funds and after consultation with Deutsche Bank, BNY in January/February 2023 paid € 7.9 million to tax authorities. The remaining € 3.9 million were paid by Hansainvest Hanseatische Investment-GmbH (the investment fund's manager). In addition, BNY received from the Frankfurt Tax Office regarding another one of the investment funds a notice and payment request regarding penalty interest (*Hinterziehungszinsen*) in the amount of € 11.6 million with a payment deadline of February 13, 2023. BNY, after consultation with Deutsche Bank, applied for a suspension of enforcement (*Aussetzung der Vollziehung*) regarding the payment request. The underlying liability amount regarding this fund paid by BNY, after consultation with Deutsche Bank, to the Frankfurt Tax Office in 2021 was € 18.3 million.

On February 6, 2019, the Regional Court (*Landgericht*) Frankfurt am Main served Deutsche Bank with a claim by M.M.Warburg & CO Gruppe GmbH and M.M.Warburg & CO (AG & Co.) KGaA (together "Warburg") in connection with cum-ex transactions of Warburg with a custody client of Deutsche Bank during 2007 to 2011. Warburg claimed from Deutsche Bank indemnification against German taxes in relation to transactions conducted in the years 2007 to 2011. Further, Warburg claimed compensation of unspecified damages relating to these transactions. Based on the tax assessment notices received for 2007 to 2011, Warburg claimed a total of € 250 million (of which € 166 million is in relation to taxes and € 84 million is in relation to interest). On March 20, 2020, Warburg extended its claim against Deutsche Bank to indemnify Warburg in relation to the € 176 million (thereof € 166 million in relation to taxes and € 10 million in relation to interest) criminal confiscation order issued by the Regional Court Bonn in the criminal cum-ex trial on March 18, 2020 regarding the same transactions. On July 28, 2021 the German Federal Court of Justice (BGH) confirmed the criminal confiscation. On September 23, 2020 the Frankfurt Regional Court fully dismissed Warburg's claim against Deutsche Bank on the grounds that Warburg as the tax debtor (*Steuerschuldner*) is primarily liable and cannot request payment from Deutsche Bank. The court further held that any claims are time-barred. On October 29, 2020, Warburg appealed the decision with the Higher Regional Court (*Oberlandesgericht*) Frankfurt am Main. On December 1, 2021, Warburg reduced its claim from the first instance proceeding. Warburg now claims € 86 million (thereof € 63 million in relation to taxes and € 23 million in relation to interest). Further, Warburg claims an amount of € 54 million in relation to the criminal confiscation. In a judgment dated March 2, 2022, the Higher Regional Court (*Oberlandesgericht*) Frankfurt am Main fully dismissed Warburg's appeal. The court did not admit an appeal of its decision to the German Federal Court of Justice (BGH). Warburg filed an appeal against this non-admission (*Nichtzulassungsbeschwerde*).

On January 25, 2021, the Regional Court (*Landgericht*) Hamburg served Deutsche Bank with a claim by Warburg Invest Kapitalanlagegesellschaft mbH (Warburg Invest) in relation to transactions of two investment funds in 2009 and 2010, respectively. Warburg Invest was fund manager for both funds. Warburg Invest claims, from Deutsche Bank together with several other parties as joint and several debtors (*Gesamtschuldner*), indemnification against German taxes in relation to cum-ex transactions conducted by the two funds. Further, Warburg Invest claims compensation of unspecified damages relating to these transactions. In November 2020, Warburg Invest received a tax liability notice from tax authorities for one of the funds in the amount of € 61 million. Based on publicly available information Deutsche Bank estimates the tax amount for the second fund to be approximately € 49 million. Warburg Invest filed its claim against several parties including Deutsche Bank *inter alia* based on an allegation of intentional damage contrary to public policy (Section 826 German Civil Code) and the accusation that Deutsche Bank participated in a business model that was contrary to public policy (*sittenwidriges Geschäftsmodell*). On July 5, 2021, Deutsche Bank submitted its defense statement to the court. On December 31, 2021, two other defendants of the proceeding served a notice of dispute (*Streitverkündung*) to several parties including Deutsche Bank. On September 30, 2022, Warburg Invest withdrew its litigation (*Rücknahme der Klage*) as far as it relates to Deutsche Bank.

The risks arising from the cum-ex topic are difficult to quantify and the likelihood of these risks materializing is hard to predict. In the event that Deutsche Bank is eventually liable under the civil law claims already asserted or under claims that will potentially be asserted by third parties in the future, this may materially and adversely affect the bank's financial condition or results of operations.

Deutsche Bank has entered into a deferred prosecution agreement (DPA) with the DOJ concerning its historical engagements of finders and consultants and precious metals spoofing. If the bank violates the DPA, its term could be extended, or the bank could be subject to criminal prosecution or other actions, any of which could result in additional fines, penalties, settlements, payments or other materially adverse impacts to the Group.

On January 8, 2021, Deutsche Bank entered into a deferred prosecution agreement (DPA) with the DOJ concerning its historical engagements of finders and consultants and, as part of the Group's obligations in the DPA, agreed to pay approximately U.S.\$ 80 million in connection with this conduct. The DPA with the DOJ also involved a resolution involving precious metals spoofing. As part of the bank's obligations in the DPA relating to precious metals, it agreed to pay approximately U.S.\$ 8 million, of which approximately U.S.\$ 6 million would be credited by virtue of its 2018 resolution with the CFTC. On the same day, the bank also reached a settlement with the SEC to resolve its investigation into conduct regarding its compliance with the U.S. Foreign Corrupt Practices Act with respect to the Group's engagement of finders and consultants. Deutsche Bank agreed to pay approximately U.S.\$ 43 million in this SEC settlement. If it violated the DPA, its term could be extended, or it could be subject to criminal prosecution or other actions, any of which could result in additional fines, penalties, settlements, payments or other materially adverse impacts to the bank. On February 28, 2022, following a finding by the DOJ that the bank violated the 2021 DPA based on untimely reporting by the bank of certain allegations relating to ESG-related information at the bank's subsidiary DWS, the bank agreed with the DOJ to extend an existing monitorship and abide by the terms of a prior deferred prosecution agreement until February 2023 to allow the monitor to certify to the bank's implementation of the related internal controls. The DOJ has reserved all rights to take further action regarding the 2021 DPA if it deems necessary.

The Group is under continuous examination by tax authorities in the jurisdictions in which it operates. Tax laws are increasingly complex and are evolving. The cost to the bank arising from the resolution of routine tax examinations, tax litigation and other forms of tax proceedings or tax disputes may increase and may adversely affect the Group's business, financial condition and results of operation.

Deutsche Bank is under continuous examination by tax authorities in the jurisdictions in which it operates. Tax laws are increasingly complex. In the current political and regulatory environment, tax administrations' and courts' interpretation of tax laws and regulations and their application are evolving, and scrutiny by tax authorities has become increasingly intense. Wide ranging and continuous changes in the principles of international taxation emanating from the OECD's Base Erosion and Profit Shifting agenda are generating significant uncertainties for the bank and its subsidiaries and may result in an increase in instances of tax disputes or instances of double taxation going forward, as member states may take different approaches in transposing these requirements into national law or may choose to implement unilateral measures. Examples are the EU directive requiring disclosure of arrangements with specific tax features that took effect in 2020, or the recent EU directive to implement the OECD global minimum taxation rules (Pillar 2) that will take effect beginning with tax year 2024. Tax administrations have also been focusing on the eligibility of taxpayers for reduced withholding taxes on dividends in connection with certain cross-border lending or derivative transactions with the German Federal Ministry of Finance having issued additional administrative guidance in this area during 2021. In addition, while a significant amount of guidance has been issued since the enactment of the U.S. tax reform at the end of 2017 which included the Base Erosion Anti-Abuse Tax provisions, uncertainties remain and further interpretative guidance may be necessary over the coming years. In August 2022, the Inflation Reduction Act of 2022 was enacted in the U.S. which included a new corporate alternative minimum tax or "CAMT" effective starting with tax year 2023. Uncertainties remain as these provisions are subject to interpretation and further interpretative guidance may be forthcoming. As a result, the cost to the bank arising from the resolution of routine tax examinations, tax litigation and other forms of tax proceedings or tax disputes, as well as from rapidly changing and increasingly complex and uncertain tax laws and principles, may increase and may adversely affect the Group's business, financial condition and results of operation.

U.S. Congressional committees and other U.S. governmental entities have sought and may seek information from the Group concerning, among other topics, potential dealings between the bank and certain former members of the U.S. executive branch, including former President Trump, his family and other close associates, exposing the bank in particular to risk to its reputation and potential loss of business as a result of extensive media attention.

A number of media entities have reported that U.S. Congressional committees and other U.S. governmental entities are seeking or may seek information from the bank concerning, among other topics, potential dealings between the bank and certain former members of the executive branch of the U.S. government, including former President Trump, his family, and other close associates. Attention surrounding such actual or potential requests and inquiries and the Group's responses can create reputational and other risks that could have a material adverse effect on the bank. Deutsche Bank's policy is to cooperate with all authorized government inquiries.

The Group has received requests for information from regulatory and law enforcement authorities concerning certain former correspondent banking relationships, including Danske Bank, exposing the bank in particular to risk to its reputation and potential loss of business as a result of extensive media attention. In the event that violations of law or regulation are found to have occurred, legal and regulatory sanctions in respect thereof may materially and adversely affect the Group's results of operations, financial condition and reputation.

The bank has received requests for information from regulatory and law enforcement authorities concerning certain former correspondent banking relationships, including Danske Bank. Deutsche Bank has provided information to and is otherwise cooperating with the investigating authorities. The bank has also completed an internal investigation focused on the bank's historical processing of correspondent banking transactions on behalf of customers of Danske Bank's Estonia branch prior to cessation of the correspondent banking relationship with that branch in 2015, including of whether any violations of law, regulation or Bank policy occurred, and the effectiveness of the related internal control environment.

Media and market attention surrounding these matters can create reputational risks in particular, even if the bank's investigations and those of the regulators and the authorities do not result in evidence of wrongdoing. The bank could in particular suffer diminished volumes of business as a result, which could have a material adverse effect on the Group's financial condition and results of operations.

Deutsche Bank has received requests for information from regulatory and law enforcement authorities concerning its anti-financial crime controls, including in the United States. In the event that violations of law or regulation are found to have occurred, legal and regulatory sanctions in respect thereof may materially and adversely affect the Group's results of operations, financial condition and reputation.

The bank has received requests for information from regulatory and law enforcement authorities concerning its anti-financial crime controls over the past several years, both generally and in connection with specific clients, counterparties or incidents, including in the United States. Among the areas within the scope of these inquiries are client onboarding and KYC processes, transaction monitoring systems and procedures, processes concerning the decision to file or not to file a suspicious activity report, escalation procedures, and other related processes and procedures. The bank is cooperating in these investigations. In the event that violations of law or regulation are found to have occurred, legal and regulatory sanctions in respect thereof may materially and adversely affect the Group's results of operations, financial condition and reputation.

In addition, the bank is engaged in ongoing regulatory discussions to resolve matters concerning adherence to prior orders and settlements related to sanctions and embargoes and AML compliance, and remedial agreements and obligations related to risk management issues.

Deutsche Bank has received requests for information from certain regulators in connection with its internal investigation into the historical sales of certain FX derivatives products. Deutsche Bank is providing information to and otherwise cooperating with its regulators. Separately, on September 30, 2021, Deutsche Bank was served with a claim that was filed in the High Courts of England and Wales by four companies within the Palladium Hotels Group.

The Palladium Hotels Group ("PHG") companies are claiming restitution or damages for alleged losses estimated at € 500 million in respect of FX derivatives trades entered into with Deutsche Bank between 2014 and 2019. They allege that Deutsche Bank made negligent misrepresentations, misstatements and/or breached a duty of care to PHG in relation to the trades. It is also alleged that one of the four PHG claimants lacked legal capacity to enter into some of the trades. On December 17, 2021, Deutsche Bank filed a defense disputing the claim on the following grounds: that PHG is a sophisticated investor with extensive experience of using derivatives, Deutsche Bank did not act as either an advisor or fiduciary to PHG, the trades reflected PHG's own trading strategy and commercial objectives and were carried out with PHG's full authorization, there were no misrepresentations, the relevant PHG claimant had capacity to enter into these trades, and that PHG well understood both the potential benefits and risks involved. On April 1, 2022, PHG filed their Reply to Deutsche Bank's defense. A case management conference procedural hearing took place on November 14, 2022, where the Court made an order, timetabling the proceedings to trial, which is expected to commence in early 2025.

If the event the bank is found liable to PHG, the damages could be substantial and impact the bank's results.

Guilty pleas by or convictions of the bank or its affiliates in criminal proceedings, or regulatory or enforcement orders, settlements or agreements to which the bank or its affiliates become subject, may have consequences that have adverse effects on certain of the Group's businesses.

Deutsche Bank and its affiliates have been and are subjects of criminal and regulatory enforcement proceedings. In particular, as part of the resolution of the investigation of the DOJ into misconduct relating to London interbank offered rates, its subsidiary DB Group Services (UK) Limited entered into a plea agreement with the DOJ in 2015, pursuant to which the company pled guilty to one count of wire fraud, and, subsequently, a judgment of conviction was issued against the company. Also, in connection with the KOSPI Index unwind matters, its subsidiary Deutsche Securities Korea Co. was convicted of vicarious corporate criminal liability in respect of spot/futures linked market manipulation by one of its employees; though the criminal trial verdict has been overturned on appeal, the Korean prosecutor's office has appealed the decision. The Group and its subsidiaries are also the subjects of other criminal or regulatory enforcement proceedings or investigations.

Guilty pleas or convictions against the bank or its affiliates, or regulatory or enforcement orders, settlements or agreements to which the bank or its affiliates become subject, could lead to the Group's ineligibility to conduct certain business activities. In particular, such guilty pleas or convictions could cause its asset management affiliates to no longer qualify as "qualified professional asset managers" (QPAMs) under the QPAM Prohibited Transaction Exemption under the U.S. Employee Retirement Income Security Act of 1974 (ERISA), which exemption is relied on to provide asset management services to certain pension plans in connection with certain asset management strategies. While there are a number of statutory exemptions and numerous other administrative exemptions that the Group's asset management affiliates may use to trade on behalf of ERISA plans, and in many instances they may do so in lieu of relying on the QPAM exemption, loss of QPAM status could cause customers who rely on such status (whether because they are legally required to do so or because the bank has agreed contractually with them to maintain such status) to cease to do business or refrain from doing business with the bank and could negatively impact its reputation more generally. For example, clients may mistakenly see the loss as a signal that the bank's asset management affiliates are somehow no longer approved as asset managers generally by the U.S. Department of Labor (DOL), the agency responsible for ERISA, and cease to do business or refrain from doing business with the Group for that reason. This could have a material adverse effect on the bank's results of operations, particularly those of its asset management business in the United States. On December 29, 2017, the DOL published a three-year individual exemption permitting certain of the bank's affiliates to retain their QPAM status despite both the conviction of DB Group Services (UK) Limited and the conviction of Deutsche Securities Korea Co. (the latter conviction has been subsequently overturned and is now the subject of an appeal). This exemption was subsequently extended by the DOL for an additional three-year period and is scheduled to expire on April 17, 2024, but may terminate earlier if, among other things, Deutsche Bank or its affiliates are convicted of crimes in other matters. The disqualification period arising from these convictions extends until April 17, 2027, so the bank will need to obtain a further exemption by April 18, 2024 to avoid a loss of QPAM status at that time.

Other Risks

In addition to the bank's traditional banking businesses of deposit-taking and lending, the Group also engages in nontraditional credit businesses in which credit is extended in transactions that include, for example, its holding of securities of third parties or engaging in complex derivative transactions. These nontraditional credit businesses materially increase the bank's exposure to credit risk.

As a bank and provider of financial services, the Group is exposed to the risk that third parties who owe the bank money, securities or other assets will not perform their obligations. Many of the bank's businesses in beyond the traditional banking businesses of deposit-taking and lending also expose the Group to credit risk.

In particular, much of the business the bank conducts through the Investment Bank entails credit transactions, frequently ancillary to other transactions. Nontraditional sources of credit risk can arise, for example, from holding securities of third parties; entering into swap or other derivative contracts under which counterparties have obligations to make payments to the bank; executing securities, futures, currency or commodity trades that fail to settle at the required time due to nondelivery by the counterparty or systems failure by clearing agents, exchanges, clearing houses or other financial intermediaries; and extending credit through other arrangements. Parties to these transactions, such as trading counterparties, may default on their obligations to Deutsche Bank due to bankruptcy, political and economic events, lack of liquidity, operational failure or other reasons.

Many of the Group's derivative transactions are individually negotiated and non-standardized, which can make exiting, transferring or settling the position difficult. Certain credit derivatives require that the bank delivers to the counterparty the underlying security, loan or other obligation in order to receive payment. In a number of cases, the bank does not hold, and may not be able to obtain, the underlying security, loan or other obligation. This could cause the Group to forfeit the payments otherwise due to it or result in settlement delays, which could damage the bank's reputation and ability to transact future business, as well as impose increased costs on the Group. Legislation in the European Union (EMIR) and the United States (the Dodd-Frank Act) has introduced requirements for the standardization, margining, central clearing and transaction reporting of certain over-the-counter derivatives. While such requirements are aimed at reducing the risk posed to counterparties and the financial system by such derivatives, they may reduce the volume and profitability of the transactions in which the bank engages, and compliance with such provisions may impose substantial costs on the bank.

The exceptionally difficult market conditions experienced during the global financial crisis severely adversely affected certain areas in which the Group does business that entail nontraditional credit risks, including the leveraged finance and structured credit markets, and similar market conditions, should they occur, may do so in the future.

[A substantial proportion of the bank's assets and liabilities comprise financial instruments that it carries at fair value, with changes in fair value recognized in the income statement. As a result of such changes, the bank has incurred losses in the past, and may incur further losses in the future.](#)

A substantial proportion of the assets and liabilities on the balance sheet comprise financial instruments that the bank carries at fair value, with changes in fair value recognized in the income statement. Fair value is defined as the price at which an asset or liability could be exchanged in an arm's length transaction between knowledgeable, willing parties, other than in a forced or liquidation sale. If the value of an asset carried at fair value declines (or the value of a liability carried at fair value increases) a corresponding unfavorable change in fair value is recognized in the income statement. These changes have been and could in the future be significant.

Observable prices or inputs are not available for certain classes of financial instruments. Fair value is determined in these cases using valuation techniques the Group believes to be appropriate for the particular instrument. The application of valuation techniques to determine fair value involves estimation and management judgment, the extent of which will vary with the degree of complexity of the instrument and liquidity in the market. Management judgment is required in the selection and application of the appropriate parameters, assumptions and modeling techniques. If any of the assumptions change due to negative market conditions or for other reasons, subsequent valuations may result in significant changes in the fair values of the bank's financial instruments, requiring the bank to record losses.

Deutsche Bank's exposure and related changes in fair value are reported net of any fair value gains that may be recorded in connection with hedging transactions related to the underlying assets. However, the bank may never realize these gains, and the fair value of the hedges may change in future periods for a number of reasons, including as a result of deterioration in the credit of its hedging counterparties. Such declines may be independent of the fair values of the underlying hedged assets or liabilities and may result in future losses.

[Pursuant to accounting rules, the bank must test the value of the goodwill in its Asset Management division and of its other intangible assets at least annually for impairment. In the event the test determines that impairment exists, the bank must write down the value of the asset. Impairments of goodwill and other intangible assets have had and may have a material adverse effect on the Group's profitability results of operations.](#)

Goodwill arises on the acquisition of subsidiaries and associates and represents the excess of the aggregate of the cost of an acquisition and any noncontrolling interests in the acquiree over the fair value of the identifiable net assets acquired at the date of the acquisition. As of December 31, 2022 and December 31, 2021, the bank recognized goodwill in the amount of € 2.9 billion and € 2.8 billion, respectively. Goodwill on the acquisition of subsidiaries is capitalized and reviewed for impairment annually or more frequently if there are indications that impairment may have occurred. Intangible assets are recognized separately from goodwill when they are separable or arise from contractual or other legal rights and their fair value can be measured reliably. These assets are tested for impairment and its useful lives reaffirmed at least annually. The Group recorded an impairment of € 68 million on an unamortized intangible asset in 2022. The intangible asset is related to retail investment management agreements in Asset Management and the impairment was driven by net outflows and increase in discount rate in the fourth quarter of 2022. The determination of the recoverable amount in the impairment assessment of non-financial assets requires estimates based on quoted market prices, prices of comparable businesses, present value or other valuation techniques, or a combination thereof, necessitating management to make subjective judgments and assumptions. These estimates and assumptions could result in significant differences to the amounts reported if underlying circumstances were to change.

Impairments of goodwill and other intangible assets have had and may have a material adverse effect on the Group's profitability and results of operations.

Pursuant to accounting rules, Deutsche Bank must review its deferred tax assets at the end of each reporting period. To the extent that it is no longer probable that sufficient taxable income will be available to allow all or a portion of the bank's deferred tax assets to be utilized, it has to reduce the carrying amounts. These reductions have had and may in the future have material adverse effects on the Group's profitability, equity and financial condition.

The bank recognizes deferred tax assets for future tax consequences attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases, unused tax losses and unused tax credits. Deferred tax assets are recognized only to the extent that it is probable that sufficient taxable profit will be available against which those unused tax losses, unused tax credits and deductible temporary differences can be utilized. As of December 31, 2022 and December 31, 2021, the bank recognized deferred tax assets of € 7.2 billion and € 6.2 billion, respectively.

In determining the amount of deferred tax assets, the bank uses historical tax capacity and profitability information and, if relevant, forecasted operating results based upon approved business plans, including a review of the eligible carry-forward periods, available tax planning opportunities and other relevant considerations. The analysis of historical tax capacity includes the determination as to whether a history of recent losses exists at the reporting date, and is generally based on the pre-tax results adjusted for permanent differences for the current and the two preceding financial years. Each quarter, the bank re-evaluates its estimate related to deferred tax assets, which can change from period to period and requires significant management judgment. For example, tax law changes or variances in future projected operating performance could result in an adjustment to the deferred tax assets that would be charged to income tax expense or directly to equity in the period such determination was made.

These adjustments have had and may in the future have material adverse effects on the Group's profitability or equity.

Deutsche Bank is exposed to pension risks which can materially impact the measurement of its pension obligations, including interest rate, inflation, longevity and liquidity risks that can materially impact the Group's earnings.

Deutsche Bank sponsors a number of post-employment benefit plans on behalf of its employees, including defined benefit plans. The bank's plans are accounted for based on the nature and substance of the plan. Generally, for defined benefit plans the value of a participant's accrued benefit is based on each employee's remuneration and length of service. The Group maintains various external pension trusts to fund the majority of its defined benefit plan obligations. The Group's funding principle is to maintain funding of the defined benefit obligation by plan assets within a range of 90 % to 100 % of the obligation, subject to meeting any local statutory requirements. The bank has also determined that certain plans should remain unfunded, although its funding approach is subject to periodic review, for example, when local regulations or practices change. Obligations for the bank's unfunded plans are accrued on the balance sheet. For most of the externally funded defined benefit plans there are local minimum funding requirements. The Group can decide on any additional plan contributions, with reference to its funding principle. There are some locations, for example the United Kingdom, where the trustees and the bank jointly agree contribution levels. The bank also sponsors retirement and termination indemnity plans in several countries, as well as some post-employment medical plans for a number of current and retired employees, mainly in the United States. The post-employment medical plans typically pay fixed percentages of medical expenses of eligible retirees after a set deductible has been met.

The bank develops and maintain guidelines for governance and risk management, including funding, asset allocation and actuarial assumption setting. In this regard, risk management means the management and control of risks for the bank related to market developments (e.g., interest rate, credit spread, price inflation), asset investment, regulatory or legislative requirements, as well as monitoring demographic changes (e.g., longevity). To the extent that pension plans are funded, the assets held mitigate some of the liability risks, but introduce investment risk. In its key pension countries, the bank's largest post-employment benefit plan risk exposures relate to potential changes in credit spreads, interest rates, price inflation, longevity risk and liquidity risk, although these have been partially mitigated through the investment strategy adopted. Overall, the bank seeks to minimize the impact of pensions on its financial position from market movements, subject to balancing the trade-offs involved in financing post-employment benefits, regulatory capital and constraints from local funding or accounting requirements.

All plans are valued annually by independent qualified actuaries using the projected unit credit method, with inputs including the discount rate, inflation rate, rate of increase in future compensation and for pensions in payment and longevity expectations. For the Group's most significant pension plans in the key countries, the discount rate used at each measurement date is set based on a high-quality corporate bond yield curve, which is derived using a bond universe sourced from reputable third-party index data providers and rating agencies, and reflects the timing, amount and currency of the future expected benefit payments for the respective plan.

The bank's investment objective in funding the plans and its obligations in respect of them is to protect the bank from adverse impacts of its defined benefit pension plans on key financial metrics. The Group seek to allocate plan assets closely to the market risk factor exposures of the pension liability to interest rates, credit spreads and inflation and, thereby, plan assets broadly reflect the underlying risk profile and currency of the pension obligations.

To the extent that the factors that drive the Group's pension liabilities move in a manner adverse to the bank, or that its assumptions regarding key variables prove incorrect, or that funding of the pension liabilities does not sufficiently hedge those liabilities, the bank could be required to make additional contributions or be exposed to actuarial or accounting losses in respect of its pension plans. More detailed information regarding the Group's employee benefit plans is provided in Note 33, "Employee Benefits" of the consolidated financial statements.

The Group's risk management policies, procedures and methods leave the Group exposed to unidentified or unanticipated risks, which could lead to material losses.

Deutsche Bank has devoted significant resources to developing its risk management policies, procedures and assessment methods and intends to continue to do so in the future. Nonetheless, the risk management techniques and strategies have not been and may in the future not be fully effective in mitigating the bank's risk exposure in all economic market environments or against all types of risk, including risks that it fails to identify or anticipate. Some of the bank's quantitative tools and metrics for managing risk are based upon its use of observed historical market behavior. The Group applies statistical and other tools to these observations to arrive at quantifications of its risk exposures. During the 2008 financial crisis, the financial markets experienced unprecedented levels of volatility (rapid changes in price direction) and the breakdown of historically observed correlations (the extent to which prices move in tandem) across asset classes, compounded by extremely limited liquidity. In this volatile market environment, the Group's risk management tools and metrics failed to predict some of the losses it experienced, and it may in the future fail to predict important risk exposures. In addition, Deutsche Bank's quantitative modeling does not take all risks into account and makes numerous assumptions regarding the overall environment, which may not be borne out by events. As a result, risk exposures have arisen and could continue to arise from factors the bank did not anticipate or correctly evaluate in its models. This has limited and could continue to limit the Group's ability to manage its risks especially in light of geopolitical developments, many of the outcomes of which are currently unforeseeable. The bank's losses thus have been and may in the future be significantly greater than the historical measures indicate.

In addition, the bank's more qualitative approach to managing those risks not taken into account by the quantitative methods could also prove insufficient, exposing the bank to material unanticipated losses. Also, if existing or potential customers or counterparties believe its risk management is inadequate, they could take their business elsewhere or seek to limit their transactions with the bank. This could harm the Group's reputation as well as its revenues and profits. See "Management Report: Risk Report" in the Annual Report 2022 for a more detailed discussion of the policies, procedures and methods the Group uses to identify, monitor and manage its risks.

Operational risks, which may arise from errors in the performance of the bank's processes, the conduct of its employees, instability, malfunction or outage of its IT system and infrastructure, or loss of business continuity, or comparable issues with respect to the Group's vendors, may disrupt its businesses and lead to material losses.

Deutsche Bank faces operational risk arising from errors, inadvertent or intentional, made in the execution, confirmation or settlement of transactions or from transactions not being properly recorded, evaluated or accounted for. An example of this risk concerns derivative contracts, which are not always confirmed with the counterparties on a timely basis. For so long as the transaction remains unconfirmed, the bank is subject to heightened credit and operational risk and in the event of a default may find it more difficult to enforce the contract.

In addition, Deutsche Bank's businesses are highly dependent on its ability to process manually or through its systems a large number of transactions on a daily basis, across numerous and diverse markets in many currencies. Some of the transactions have become increasingly complex. Moreover, management relies heavily on its financial, accounting and other data processing systems that include manual processing components. If any of these processes or systems do not operate properly, or are disabled, or subject to intentional or inadvertent human error, the bank could suffer financial loss, a disruption of its businesses, liability to clients, regulatory intervention or reputational damage.

The bank is also dependent on its employees to conduct its business in accordance with applicable laws, regulations and generally accepted business standards. If the bank's employees do not conduct its business in this manner, the bank may be exposed to material losses. Furthermore, if an employee's misconduct reflects fraudulent intent, the Group could also be exposed to reputational damage. The bank categorizes these risks as conduct risk, a term used to describe the risks associated with behavior by employees and agents, including third parties, that could harm clients, customers or the integrity of the markets, such as selling products that are not suitable for a particular customer, fraud, unauthorized trading and failure to comply with applicable regulations, laws and internal policies. U.S. regulators in particular have been increasingly focused on conduct risk, and such heightened regulatory scrutiny and expectations could lead to investigations and other inquiries, as well as remediation requirements, more regulatory or other enforcement proceedings, civil litigation and higher compliance and other risks and costs.

The Group in particular faces the risk of loss events due to the instability, malfunction or outage of its IT system and IT infrastructure, as well as breaches in IT system and infrastructure (including cyber-attacks). Such losses could materially affect the bank's ability to perform business processes and may, for example, arise from the erroneous or delayed execution of processes as a result of system outages, degraded services in systems and IT applications or the inaccessibility of its IT systems. A delay in processing a transaction, for example, could result in an operational loss if market conditions worsen during the period after the error. IT-related errors may also result in the mishandling of confidential information, damage to the bank's computer systems, financial losses, additional costs for repairing systems, reputational damage, customer dissatisfaction or potential regulatory or litigation exposure (including under data protection laws such as the GDPR).

The continuing move across global industries to conduct business from home and away from primary office locations is driving a more accelerated evolution of business practices compared to historic trends. The demand on the bank's technology infrastructure and the risk of cyber-attacks could lead to technology failures, security breaches, unauthorized access, loss or destruction of data or unavailability of services, as well as increase the likelihood of conduct breaches.

Business continuity risk is the risk of incurring losses resulting from the interruption of normal business activities. The bank operates in many geographic locations and is frequently subject to the occurrence of events outside of its control. Despite the contingency plans the bank has in place, its ability to conduct business in any of these locations may be adversely impacted by a disruption to the infrastructure that supports the bank's business, whether as a result of, for example, events that affect the bank's third-party vendors or the community or public infrastructure in which the bank operates. Any number of events could cause such a disruption including deliberate acts such as acts of war or other military action, sabotage, terrorist activities, bomb threats, strikes, riots and assaults on the bank's staff; natural calamities such as hurricanes, snowstorms, floods, disease pandemics (such as the COVID-19 pandemic) and earthquakes; or other unforeseen incidents such as accidents, fires, explosions, utility outages and political unrest. Any such disruption could have a material adverse effect on the bank's business and financial position.

As a global bank, Deutsche Bank is often the subject of news reports. Deutsche Bank conducts its media dialogue through official teams. However, members of the media sometimes approach Deutsche Bank staff outside of these channels and Deutsche Bank-internal information, including confidential matters, have been subject to external news media coverage, which may result in publication of confidential information. Leaks to the media can have severe consequences for Deutsche Bank, particularly when they involve inaccurate statements, rumors, speculation or unsanctioned opinions. This can result in financial consequences such as the loss of confidence or business with clients and may impact the bank's share price or capital instruments by undermining investor confidence. Then bank's ability to protect itself against these risks is limited.

Deutsche Bank utilizes a variety of third parties in support of its business and operations. Services provided by third parties pose risks to the bank comparable to those it bears when it performs the services, and the bank remains ultimately responsible for the services its third parties provide. Furthermore, if a third party does not conduct business in accordance with applicable standards or its expectations, the bank could be exposed to material losses or regulatory action or litigation or fail to achieve the benefits it sought from the relationship.

The bank utilizes a variety of third parties in support of its business and operations. In support of the Group's business and operations, the use of and dependence upon third parties in the sector has increased over the years, necessitating a corresponding increase in capabilities to manage them. The bank does so in order to focus on its core competencies and to seek improvements in costs, efficiency and effectiveness in its operations, for instance in connection with the bank's IT modernization efforts. The nature of what the bank uses third parties for has evolved and now includes more fundamental aspects of services including the use of Cloud and other advanced technology providers. This represents different risks and requires more robust risk assessments, appropriate contracting and ongoing oversight commensurate with those risks. It has also led to steady increase in regulation and regulatory scrutiny over not just how the Group manages third parties day to day but also assessing the levels of resiliency needed that is proportional to the importance of the business services supported by the third party.

Services provided by third parties pose risks to the bank comparable to those the Group bears when it performs the services itself, and it remains ultimately responsible for the services the third parties provide. The Group depends on such third parties to conduct its delivery of services in compliance with applicable laws, regulations and generally accepted business standards and in accordance with the contractual terms and service levels it has agreed with the Group. If the third parties do not conduct business in accordance with these standards, the bank may be exposed to material losses and could be subject to regulatory action or litigation as well as be exposed to reputational damage. More generally, if a third-party relationship does not meet the bank's expectations, the Group could be exposed to financial risks, such as the costs and expenses associated with migration of the services to another third party and business and operational risks related to the transition, and the bank could fail to achieve the benefits it sought from the relationship.

In situations where Deutsche Bank is the third party service provider, the bank may be exposed to financial risks, such as lost revenues, costs and expenses associated with the cancellation of the service agreement, if Deutsche Bank were no longer able to benefit from the relationship.

Deutsche Bank's operational systems are subject to an increasing risk of cyber-attacks and other internet crime, which could result in material losses of client or customer information, damage its reputation and lead to regulatory penalties and financial losses.

Deutsche Bank faces the risk of breaches of the confidentiality, integrity and availability of the bank or its clients' information. This includes risks such as breaches of the security of the bank or its vendors' computer systems due to unauthorized access to networks or resources, the introduction of computer viruses or malware, or other forms of cybersecurity attacks or incidents.

Financially motivated and other sophisticated cyber-attacks, including ransomware, can be observed as a persistent threat across industries and are anticipated to become more frequent. Additional threats are posed by supply chain attacks, an increasing frequency of high-rated zero-day exploits and an expanding threat surface introduced by, for example, remote ways of working or the use of cloud services.

Deutsche Bank may face operational risks arising from failures in the control environment, including errors in the performance of processes or security controls, as well as loss of data, which may disrupt its business and lead to material losses. At the same time, the bank may also face risks of material losses or reputational damage if services are not provided as agreed or in line with internal standards. Cyber-attacks could impact the Group both directly and indirectly including impact at third parties.

Deutsche Bank continues to invest toward the protection of its computer systems against such breaches and toward ensuring that its vendors employ appropriate cybersecurity safeguards. Of particular importance in 2022 was the continued focus on addressing the following main threat scenarios: financial theft, data disclosure, and service disruption along with system misuse, asset or data destruction, data distortion and information security regulatory adherence and conduct risk. To address the evolving cyber threat risk, the bank continues to modify and enhance its protective measures and to investigate and remediate information security vulnerabilities. These measures, however, may not be effective against the many security threats the Group faces.

The increasing frequency and sophistication of recent cyber-attacks has resulted in an elevated risk profile for many organizations around the world including Deutsche Bank, and significant attention by the bank's management has been paid to the overall level of preparedness against such attacks. Cybersecurity is growing in importance due to factors such as the continued and increasing reliance on the bank's technology environment as well as potential risks arising from the need for digital innovation such as the usage of public cloud. Deutsche Bank and other financial institutions have experienced attacks on computer systems, including attacks aimed at obtaining unauthorized access to confidential company or customer information or damaging or interfering with company data, resources, or business activities, or otherwise exploiting vulnerabilities in its infrastructure. The Group expects to continue to be the target of such attacks in the future. Although to date the bank has not experienced any material business impact from these attacks, the Group may not be able to effectively anticipate and prevent more material attacks from occurring in the future.

The move across global industries to conduct business from home and away from primary office locations in the wake of the so called 'New Work' transformation also exposes the bank to a greater risk of cyber-attacks, which could lead to technology failures, security breaches, unauthorized access, loss or destruction of data or unavailability of services.

A successful attack could have a significant negative impact on the group, including as a result of disclosure or misappropriation of client or proprietary information, damage to computer systems, an inability to access information technology (IT) systems, financial losses, remediation costs (such as for investigation and re-establishing services), increased cybersecurity costs (such as for additional personnel, technology, or third-party vendors), personal data breach notification obligations, reputational damage, customer dissatisfaction and potential regulatory or litigation exposure.

Digital innovation offers market entry opportunities for new competitors such as cross-industry entrants, global high-tech companies or financial technology companies. Therefore, the bank expects its businesses to have an increased need for investment in digital product and process resources to mitigate the risk of a potential loss of market share.

To be able to respond to market developments, respond more quickly to clients' needs and to have more flexibility, and to improve IT resiliency, the bank has decided to migrate a large number of applications to public cloud computing and storage systems through a strategic partnership with Google Cloud. This partnership with Google Cloud is a major milestone in the bank's digital journey and shows a commitment to embracing new technologies. The objective is to enhance the client experience through improved products and services, system resiliency and security as well as reducing the cost inefficiencies of running legacy platforms. Such a major technology migration requires robust governance and planning, including required allocation of funding, to manage the risk of security and stability issues. Additionally, there is significant regulatory interest in this program. Also, as with any external service providers, the bank must ensure the highest standards of data privacy and security controls to safeguard client and bank information. Failure to do so can compromise client trust, lead to financial losses and, in severe cases, regulatory penalties, litigation and the obligation to compensate individuals for damage.

Deutsche Bank continues to mature its overall data management strategy against its core processes and data sets such as transactional, client and reference data. This includes the development and implementation of the bank's enterprise architecture principles across the core technology infrastructure. This is central to Deutsche Bank's wider technology and data strategy, enabling business growth and efficiencies, while also enhancing the control environment. Deutsche Bank's regulators are actively focused on the bank's progress on this component of its strategy. Furthermore, the bank also faces challenges with respect to embracing and incorporating new and disruptive technologies in conjunction with existing technological architecture in order to ensure industry standards of information security and customer experience.

Major technology transformations in the bank's business and infrastructure areas are executed via dedicated initiatives. The intended benefits of these include IT and business cost reduction, control improvements, revenue growth through provision of new client features or targeted client growth. One of these initiatives, UNITY, which aims at simplifying the bank's IT environment through the migration of IT systems from the former Postbank into those of Deutsche Bank, faces important milestones before its completion in 2023. Program execution risks include resource shortages, dependencies on other programs and key deliverables, extended implementation timelines, impact of the change-related activity on the control environment and functionality issues in the upgraded applications or underlying technology. While the bank endeavors to manage its initiatives to mitigate such risks, it cannot be assured that all risks have been completely mitigated and the risk remains that the initiatives may not fully achieve the expected benefits on the expected timetable.

The crypto-assets ecosystem experienced significant volatility in 2022 and continues to carry significant inherent risks.

Crypto assets carry extreme price volatility risk, unclear price transparency, have underdeveloped liquidity and may be susceptible to market manipulation. Deutsche Bank's crypto-related activities and direct risk exposures are extremely limited and the risk of broader contagion to financial markets is still considered to be limited. Despite the risks currently posed by crypto assets, the bank is cognizant of the innovation that is occurring in this space and is considering possible opportunities to leverage the benefits of the underlying technology and address customer needs. However, by maintaining a cautious and highly selective approach, the bank may miss out on opportunities.

The ability for banks to be able to engage in digital asset activities will vary depending on the stances taken within each jurisdiction and this may limit Deutsche Bank's ability to engage in these activities. Discussions regarding the required policy frameworks required to address the risks and opportunities of digital assets have increased due to numerous insolvency and fraud cases related to individual crypto assets or platforms.

The size of the Group's clearing operations exposes the bank to a heightened risk of material losses should these operations fail to function properly.

The Group has large clearing and settlement businesses and an increasingly complex and interconnected IT landscape. These give rise to the risk that the bank's customers or other third parties could lose substantial sums if the systems fail to operate properly for even short periods. This will be the case even where the reason for the interruption is external to the bank. In such a case, the Group might suffer harm to its reputation even if no material amounts of money are lost. This could cause customers to take their business elsewhere, which could materially harm the Group's revenues and profits.

Ongoing global benchmark reform efforts, specifically the transition from interbank offered rates to alternative reference rates, including “risk-free-rates”, introduce a number of inherent risks to the bank’s business and the financial industry. These risks, should they materialize, may have adverse effects on the Group’s business, results of operations and profitability.

Regulators and central banks have set the goal of improving the robustness of financial benchmarks, especially interest rate benchmarks. As a result of this initiative, as of the end of 2022, most LIBOR settings have ceased to be published or are no longer available in representative form. Certain tenors of GBP LIBOR remain available in synthetic form for a limited time period, only to enable so called ‘tough legacy’ transactions to transition to suitable Risk-Free Rate (RFR) alternatives. A reduced number of USD LIBOR tenors will be published until the end of June 2023, however, the new use of USD LIBOR is subject to significant limitations. The FCA is currently consulting on the requirement for a synthetic USD LIBOR for 1-, 3- and 6-month settings, including the methodology and allowable ‘tough legacy’ use cases.

In the United States, the Adjustable Interest Rate (LIBOR) Act was signed into law by President Biden on March 15, 2022. The Act provides a clear federal solution for transitioning legacy contracts that either lack or contain insufficient contractual provisions by providing for the transition from LIBOR to a replacement rate. The Federal Reserve Board has also adopted the final rule that implements this Act, which establishes benchmark replacements for contracts governed by U.S. law that reference certain tenors of USD LIBOR that do not have suitable fallback provisions after June 30, 2023.

A material portion of the Group’s assets and liabilities, including financial instruments in which the bank trades and other transactions and services in which the bank is involved, have interest rates that are linked to LIBOR, EONIA or similar inter-bank offered rates (“IBORs”), predominantly to USD LIBOR, and other financial benchmarks that have already ceased or that will be subject to future discontinuation. Transition of legacy transactions will depend, in some cases on client engagement and agreement to spread adjustments, which may not be forthcoming. In some cases, transition of legacy products may be hampered by structural factors, such as technical inability to contact numerous bondholders. Risks remain in respect of the bank’s tough legacy exposures which reference IBORs, especially USD LIBOR. Uncertainties around the timing and method of transition of certain products continues to present a number of risks for the bank, its customers and the financial services industry more widely. Ongoing risks include:

- Legal and compliance risk (including conduct risk) may arise due to possible disputes regarding either the terms of financial contracts with counterparties, or the manner of transition to replacement rates. Many financial instruments linked to financial benchmarks contain provisions, known as fallbacks, for the use of a successor interest rate in the event of the discontinuation of the benchmark, while others do not. The quality of fallbacks in contracts has improved in respect of a number of products in very recent times, but risks remain that some fallbacks may not perform well. In connection with discontinuation and transition, the counterparty to the financial instrument may challenge the rate determined by a fallback for such an instrument, particularly if the bank is involved in the determination or setting of the successor rate. Such disputes could result in litigation or regulatory action founded in claims of breach of contract, anti-trust violations, market abuse, and/or other mistreatment of customers.
- Legal and compliance risk may derive from any failure to comply with regulators’ expectations that new use of financial benchmarks will cease.
- While liquidity has developed in SOFR-related products, liquidity risk remains for USD LIBOR exposures toward the date of discontinuation and in relation to tough-legacy products which use synthetic LIBOR, which may perform differently than historic LIBORs.
- The replacement of financial benchmarks, or use of synthetic LIBOR, could adversely impact the value of and return on existing instruments and contracts and the market for securities and other instruments whose returns are linked to such benchmarks.
- Market risk may arise due to interest rate “basis” risks – the risks posed by different interest rate provisions applying to assets than to liabilities – across tenors and currencies, driven by differing fallback methodologies and timings. Different timings of adoption of fallback protocols will create new basis and potentially make hedging more costly or less effective, and losses may result from value transfer in the fallback methodology adopted. Due to the unavailability and discontinuation of financial benchmarks that have already happened, and that are yet to come, the bank may incur losses in respect of its assets and liabilities if the successor interest rate is not economically equivalent to the discontinued benchmarks.
- Finance and tax risk may arise due to the discontinuation of financial benchmarks and transition to RFRs, which could cause hedge accounting items to be derecognized, adversely impacting the bank’s profitability or causing the bank to incur losses. Discontinuation and transition could also pose difficulties for the independent price verification of financial instruments, where market data is unavailable for the new or modified financial instrument. Tax uncertainties could arise, for example, if a discontinuation or transition is viewed as a significant modification of a financial instrument that results in a profit or loss recognition event for tax purposes.

- Technology and operational risk may arise as a result of the complexity of transition processes, which will require collaboration with regulators and central banks as well as a wide range of market participants. Also, ongoing change efforts – relating to RFR product development, re-documentation of client contracts and infrastructure change, including to systems, processes and models across the business and the bank's Finance, Risk and Treasury functions –, has been required. There is a risk that not all systems and process dependencies on financial benchmark availability have been identified and remediated. Successful transition processes are, to some extent, dependent on achieving industry and client consensus on standards and conventions, timing and sequencing of transition steps, creation of forward-looking term versions of the RFRs and the timely re-documenting of client contracts.

While the Group continues to actively manage the transition to alternative reference rates, the risk remains that implementation of any alternative RFRs may be impossible or impracticable under the existing terms of such financial instruments and could have an adverse effect on the value of certain financial instruments and on the Group's profitability. There is also the risk of an adverse effect to reported performance arising from the transition rules established by accounting bodies.

More broadly, initiatives to reform existing benchmarks and the Group's participation in them, including as benchmark submitter, could potentially expose the Group to legal, reputational or other risks. In particular, legal and compliance risk (including conduct risk) may arise due to the operational risks of participating in benchmark submissions, either as part of a panel with the requirement to use models and potentially exercise expert judgement or as provider of transactions data to a benchmark administrator.

Deutsche Bank is subject to laws and other requirements relating to financial and trade sanctions and embargoes. If the bank breaches such laws and requirements, it can be subject, and in the past has been subject, to material regulatory enforcement actions and penalties.

The bank is required to monitor, evaluate, and observe laws and other requirements relating to financial and trade sanctions and embargoes set by the EU, the Deutsche Bundesbank, Germany's Federal Office for Economic Affairs and Export Control, and other authorities, such as the U.S. Treasury Department's Office of Foreign Assets Control (OFAC) and the UK Treasury Department's Office of Financial Sanctions Implementation (OFSI). Sanctions are subject to rapid change, and it is also possible that new direct or indirect secondary sanctions could be imposed by the United States or other jurisdictions without warning as a result of geopolitical developments. New and far-reaching sanctions against Russian entities and individuals have been imposed by the United States, the EU, the United Kingdom and other individual countries very rapidly following the commencement by Russia of the war in Ukraine, and many of these sanctions require very rapid implementation. Should the bank fail to comply timely and in all respects with these new sanctions, the Group could be exposed to legal penalties and its reputation could suffer. New sanctions may also be imposed on other entities and individuals beyond the war in Ukraine at any time. If Deutsche Bank breaches any such new or preexisting laws and requirements, it can be subject, and has in the past been subject, to material regulatory enforcement actions and penalties.

Transactions with counterparties in countries designated by the U.S. State Department as state sponsors of terrorism or persons targeted by U.S. economic sanctions may lead potential customers and investors to avoid doing business with the bank or investing in the bank's securities, harm its reputation or result in regulatory or enforcement action which could materially and adversely affect its business.

The bank engages or has engaged in a limited amount of business with counterparties, including government-owned or -controlled counterparties, in certain countries or territories that are subject to comprehensive U.S. sanctions, including Iran and Cuba (referred to as "Sanctioned Countries"), or with persons targeted by U.S. economic sanctions (referred to as "Sanctioned Persons"). U.S. law generally prohibits U.S. persons or any other persons acting within U.S. jurisdiction (which includes business with a U.S. nexus) from dealings with or relating to Sanctioned Countries or Sanctioned Persons. Additionally, U.S. indirect or "secondary" sanctions threaten the imposition of sanctions against non-U.S. persons entirely outside of U.S. jurisdiction for engaging in certain activities, including categories of transactions with certain entities and countries. Thus, U.S. sanctions may implicate activities in other geographic areas and by non-U.S. persons depending on the circumstances. The bank's U.S. subsidiaries, branch offices, and employees are, and, in some cases, its non-U.S. subsidiaries, branch offices, and employees are or may become, subject to such prohibitions and other regulations.

Deutsche Bank is a German bank and its activities with respect to Sanctioned Countries and Sanctioned Persons have been subject to policies and procedures designed to avoid the involvement of U.S. jurisdiction, including U.S. persons acting in any managerial or operational role and to ensure compliance with United Nations, European Union and German sanctions and embargoes; in reflection of legal developments in recent years, the bank has further developed its policies and procedures with the aim of promoting – to the extent legally permitted – compliance with regulatory requirements extending to other geographic areas regardless of jurisdiction. However, should its policies prove to be, or have been, ineffective, the bank may be subject to regulatory or enforcement action that could materially and adversely affect its reputation, financial condition, or business. The Group has also taken other action to reduce the risk of compliance violations. In 2007, the Management Board decided that it will not engage in new business with counterparties in countries such as Iran, Syria, Sudan and North Korea and to exit existing business to the extent legally possible. In 2014, the bank added the Crimea Region, and in 2021 Afghanistan, to this list of countries, while de-listing Sudan. The bank also decided to limit its business with counterparties in Cuba. Iran, North Korea, Syria and Cuba are currently designated as state sponsors of terrorism by the U.S. State Department. In 2022, the bank expanded its policy and included broad prohibitions relating to the areas in Ukraine occupied through Russia's war in 2022 and policy restrictions going beyond regulatory requirements related to Russia and Belarus in light of the war against Ukraine.

The bank had a representative office in Tehran, Iran, which the bank discontinued on December 31, 2007. The Group's remaining business with Iranian counterparties consisted mostly of participations as lender and/or agent in a few large trade finance facilities arranged before 2007 to finance the export contracts of exporters in Europe and Asia. As of December 31, 2018, those loans were fully paid back, and subsequently the majority of the remaining Iranian business consists of legacy contractual obligations related to guarantees. The Group does not believe its business activities with Iranian counterparties are or had been material to its overall business, with the aforementioned guarantees having notional amounts of substantially less than 0.01 % of total assets over recent years. The revenues from such activities represented substantially less than 0.01 % of total revenues for the year ended December 31, 2022.

As required by Section 219 of the Iran Threat Reduction and Syria Human Rights Act of 2012 (Section 13(r) of the Securities Exchange Act of 1934, as amended) the bank has disclosed certain information regarding its activities or transactions with persons subject to U.S. sanctions against Iran and other persons subject to such provision. Such disclosure is set forth in the section of this document entitled "Disclosures Under Iran Threat Reduction and Syria Human Rights Act of 2012", which follows "Item 16I: Disclosure Regarding Foreign Jurisdictions that Prevent Inspections".

Deutsche Bank is also engaged in a limited amount of business with counterparties domiciled in Cuba, which is not subject to any United Nations, European Union or German embargoes. The business consists of a limited number of letters of credit and of cash payments, each without a U.S. nexus, and it represented substantially less than 0.01 % of the Group's assets as of December 31, 2022. The letters of credit served to finance commercial products such as machinery as well as medical products.

The Group has set up processes and procedures aimed at complying with other substantial changes in U.S. economic sanctions that have occurred since 2017. In August 2017, the United States enacted the "Countering America's Adversaries Through Sanctions Act" (referred to as "CAATSA"), which codifies existing U.S. sanctions against Russia (including designation of Russian entities under U.S. sanctions), expands U.S. secondary sanctions against Russia, tightens existing sectoral sanctions (targeting specific sectors of the Russian economy), and permits the imposition of sectoral sanctions against additional sectors of the Russian economy. In particular, expanded U.S. secondary sanctions under CAATSA allow for the imposition of U.S. sanctions on, among others, non-U.S. entities who engage in, among other activities, "significant" transactions with persons targeted under Russia-related sanctions or specific entities in the Russian defense and intelligence sectors, as well as certain energy projects relating to Russia. The bank does not believe it has engaged or is currently engaged in any transactions with Russian entities that violate, or are sanctionable under, U.S. sanctions. However, given the broad discretion U.S. authorities have in interpreting and enforcing U.S. sanctions, there can be no assurances that U.S. authorities will not bring enforcement actions against the bank, or impose secondary sanctions on the bank for its ongoing activities. Any such actions could have a material impact on the Group's business and harm its reputation. Further, in response to the war in Ukraine, the United States, as well as other nations and the EU, have expanded sanctions on Russia and Russian entities; such sanctions could have a material impact on the bank's business activities. In response to the war in Ukraine and following the imposition of further far-reaching sanctions by democratic countries against Russia, the bank took a range of preparatory and responsive actions to implement the high number of, and in part newly developed, sanctions by inter alia filter and control updates, additional due diligence steps in transaction and client reviews with a nexus to Russia and by further restricting its policy and adjusting processes. Even though Deutsche Bank believes that it reacted quickly and thoroughly to these challenges, the sheer amount of changes and their quality and complexity have increased the operational risk that the bank will have missed out unintentionally on some of the regulatory requirements; given the strict liability applied in areas of this regulatory environment, this operational risk may translate into regulatory risks for the bank leading to consequential losses.

Additionally, since 2017, the U.S. Administration has imposed a number of sanctions against the Government of Venezuela and Venezuelan officials. These sanctions prohibit (beginning on August 5, 2019) virtually all unlicensed transactions involving the Government of Venezuela, including state-owned or state-controlled companies, and also threaten to impose sanctions on (non-U.S.) persons having materially assisted such transactions or dealings. The Group has taken steps and established processes and procedures aimed at complying with these U.S. sanctions against the Government of Venezuela. In response to these U.S. sanctions, the bank has wound down several client relationships. With respect to entities of the Government of Venezuela, the Group are currently only engaged in legacy transactions. The bank does not believe that any of its remaining activities related to the Government of Venezuela violate U.S. sanctions. However, given the broad discretion U.S. authorities have in interpreting and enforcing U.S. sanctions, there can be no assurances that U.S. authorities will not allege that the Group's ongoing activities violate U.S. sanctions.

Political and trade tensions between the United States and China led to a series of sanctions and countermeasures in 2020 and 2021, some of which were particularly relevant to financial institutions. In June 2021, the United States adopted Executive Order 14032, which amended an existing restriction and restricts purchases and sales by U.S. persons of certain publicly traded securities linked to companies the United States determines are affiliated with the Chinese military-industrial complex, as well as publicly traded securities that are derivative of or designed to provide investment exposure to such securities. Executive Order 14032 amended and clarified similar restrictions that had been imposed under a previous executive order. While the bank has implemented changes in its control processes to promote compliance with these requirements, such measures raise potential regulatory compliance and conflicts of laws challenges and the impacts of such measures could be material and adverse.

The Group is aware, through press reports and other means, of initiatives by governmental and non-governmental entities in the United States and elsewhere to adopt laws, regulations or policies prohibiting transactions with or investment in, or requiring divestment from, entities doing business with Sanctioned Countries, particularly China, Iran and Russia. Such initiatives may result in the bank being unable to gain or retain entities subject to such prohibitions as customers or as investors in its securities. In addition, the Group's reputation may suffer due to its association with such countries. Such a result could have significant adverse effects on the business or the price of the bank's securities. Sanctions are subject to rapid change and it is also possible that new direct or indirect secondary sanctions could be imposed by the United States or other jurisdictions without warning as a result of geopolitical developments.

Item 4: Information on the company

History and development of the company

The legal and commercial name of the company is Deutsche Bank Aktiengesellschaft. It is a stock corporation organized under the laws of Germany.

Deutsche Bank Aktiengesellschaft originated from the reunification of Norddeutsche Bank Aktiengesellschaft, Hamburg, Rheinisch-Westfälische Bank Aktiengesellschaft, Düsseldorf, and Süddeutsche Bank Aktiengesellschaft, Munich. Pursuant to the Law on the Regional Scope of Credit Institutions, these were disincorporated in 1952 from Deutsche Bank, which had been founded in 1870. The merger and the name were entered in the Commercial Register of the District Court Frankfurt am Main on May 2, 1957.

The bank is registered under registration number HRB 30 000. Deutsche Bank's registered address is Taunusanlage 12, 60325 Frankfurt am Main, Germany, and its telephone number is +49-69-910-00. The bank's agent in the United States is: DB USA Corporation, c/o Office of the Secretary, 1 Columbus Circle, Mail Stop NYC01-1950, New York, New York 10019-8735.

For information on significant capital expenditures and divestitures, please see "Management Report: Operating and Financial Review: Deutsche Bank Group: Significant Capital Expenditures and Divestitures" in the Annual Report 2022.

The Securities and Exchange Commission ("SEC") maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, such as Deutsche Bank Aktiengesellschaft, with the address <http://www.sec.gov>. Deutsche Bank's filings are available on the SEC's Internet site under File Number 001-15242 and Internet address is <http://www.db.com>.

Business Overview

Deutsche Bank's Organization

Please see "Management Report: Operating and Financial Review: Deutsche Bank Group: Deutsche Bank's Organization" in the Annual Report 2022. For information on net revenues by geographic area and by corporate division please see Note 4 "Business Segments and Related Information: Entity-Wide Disclosures" to the consolidated financial statements and "Management Report: Operating and Financial Review: Results of Operations: Segment Results of Operations" in the Annual Report 2022.

Management Structure

Please see "Management Report: Operating and Financial Review: Deutsche Bank Group: Management Structure" in the Annual Report 2022.

Business Strategy

“Compete to Win”

In July 2019, the Group announced its plans for a fundamental transformation of Deutsche Bank and set key financial targets to be met by the end of 2022. Despite facing unforeseen and significant challenges from the COVID-19 pandemic and the war in Ukraine, the bank has undergone a fundamental transformation and has achieved key financial targets.

Deutsche Bank believes that five decisive actions contributed to the bank's successful transformation:

- The Group created four client-centric divisions delivering stable growth. These divisions complement each other and provide well-diversified earnings streams
- Deutsche Bank exited businesses and activities which were not core to its strategy. The Group exited equities trading, transferred its Global Prime Finance business, re-focused the Rates business and downsized or disposed other non-strategic assets. The Capital Release Unit reduced leverage exposure from non-strategic activities by 91% and risk weighted assets by 83% excluding risk-weighted assets from operational risk enabling the Group to re-deploy capital into its core businesses
- Deutsche Bank cut costs compared to the pre-transformation level in 2018. The Group reduced its cost/income ratio by 18 percentage points, which was achieved while absorbing € 8.5 billion transformation related effects, including € 1.0 billion goodwill impairment, € 1.9 billion restructuring and severance, € 0.6 billion real estate charges, € 1.4 billion software impairment and accelerated amortization, € 2.8 billion deferred tax asset valuation adjustments as well as € 0.8 billion other transformation-related effects
- Deutsche Bank committed to and invested in controls and technology to support growth. The Group signed state of the art agreements with Google Cloud and other partners including a multi-year innovation partnership with NVIDIA in order to accelerate artificial intelligence usage and machine learning. The bank's focus on technology has allowed it to grow revenues through a closer interface with clients, reduce costs by removing complexity in its technology and improve the control environment
- Deutsche Bank managed and freed up capital. The Group kept its CET1 ratio above its minimum target of 12.5% through all fourteen quarters of its transformation, despite an impact of around 170 basis points from regulatory changes and of 100 basis points from transformation-related impacts

The fundamental transformation has led to a strong foundation for the Group to continue its journey and successful completion of the bank's “Compete to Win” strategy.

Deutsche Bank's key performance indicators 2022

Financial targets for 2022

- Post-tax Return on Average Tangible Equity of 8% for the Group
- Post-tax Return on Average Tangible Equity of more than 9% for the Core Bank
- Common Equity Tier 1 capital ratio of above 12.5%
- Leverage ratio of approximately 4.5%

Deutsche Bank's financial results in 2022

Sustaining revenue growth in the Core Bank

Deutsche Bank's strategic transformation was designed to refocus its Core Bank around its market-leading businesses, which operate in growing markets with attractive return potential. The Group's Core Bank comprises its four core operating divisions, namely the Corporate Bank, the Investment Bank, the Private Bank and Asset Management, together with the segment Corporate & Other.

Revenues at both the Group level and in the Core Bank amounted to € 27.1 billion in 2022, an increase of 6% and 6%, respectively, compared to 2021.

Continuing to deliver on efficiency measures

Noninterest expenses were € 20.4 billion in 2022, a decrease of 5.2% versus 2021, driven by lower restructuring and severance and lower transformation charges. Adjusted costs excluding transformation charges increased by 1.1% to € 19.8 billion compared to 2021. Increases in compensation and benefits were mostly offset by reductions in non-compensation costs. These reductions in non-compensation expenses reflect continued cost management efforts, specifically from reduced costs for outsourced operations and lower occupancy-related spend. If adjusted for foreign exchange impacts, adjusted costs excluding transformation charges decreased by 1.6% versus 2021.

Successful achievement against targets by the Capital Release Unit

In 2022, having outperformed against the Capital Release Unit's targets for leverage exposure and RWAs, the Capital Release Unit also successfully met its target of less than € 800 million for adjusted costs excluding transformation charges. Noninterest expenses were € 922 million.

The Capital Release Unit reduced its loss before tax by a third, recording a loss before tax of € 932 million for the full year 2022, an improvement of € 431 million from the prior year period.

At year-end 2022, risk weighted assets (RWA) were reduced to € 24 billion, ahead of Deutsche Bank's year-end 2022 target of € 32 billion, and down from € 28 billion at the end of 2021. At December 31, 2022, the unit's RWAs included operational risk RWA of € 19 billion.

Leverage exposure was € 22 billion at the end of 2022, ahead of its target of € 51 billion for 2022, and down from € 39 billion at the end of 2021.

Since its inception in the second quarter of 2019, the Capital Release Unit has reduced risk weighted assets by 63%, or 83% excluding operational risk RWA, and leverage exposure by 91%.

Having fulfilled its de-risking and cost reduction mandate from 2019 through the end of 2022, the Capital Release Unit will cease to be reported as a separate segment with effect from the first quarter of 2023. Its remaining portfolio, resources and employees will be reported within the Corporate & Other segment.

Conservative balance sheet management

The Group remains committed to managing its balance sheet conservatively as the bank continues to navigate through the challenges posed by the war in Ukraine, inflation and the dynamic interest rate environment. At the end of the fourth quarter of 2022, the Group's CET 1 ratio was 13.4%, 10 basis points higher compared to year end 2021. Deutsche Bank aims for a Common Equity Tier 1 capital ratio of around 13% and to end 2023 with a CET 1 ratio of 200 basis points above the bank's Maximum Distributable Amount threshold.

Leverage ratio was 4.6% in 2022, 30 basis points lower compared to year end 2021.

Average one day value-at-risk (VaR) amounted to € 47 million at the end of 2022 confirming Deutsche Bank's conservative risk levels.

Provisions for credit losses were € 1.2 billion for the full year 2022, significantly higher compared to 2021. For the full year 2023, the Group expects provision for credit losses to be essentially flat in a range of 25 to 30 basis points of average loans, reflecting persistent macro-economic and geopolitical uncertainties. As such and given the recent improvement in the macro-economic outlook, the bank now foresees provision for credit losses in 2023 at the low end of this range. The bank expects provision for credit losses in 2023, unlike in 2022, to be driven by single-name losses rather than a deterioration of macro-economic forward-looking indicators. Deutsche Bank remains committed to its stringent underwriting standards and tight risk management framework. Further details on the calculation of expected credit losses are provided in the section "Management Report: Risk Report".

“Global Hausbank”

The Group believes that the progress made in transforming Deutsche Bank leaves the bank well positioned to deliver sustainable growth through 2025. In March 2022, the Group outlined its strategic and financial roadmap through 2025, which aims to position Deutsche Bank as a “Global Hausbank”, and communicated Deutsche Bank’s 2025 financial targets and capital objectives.

The ‘Global Hausbank’ strategy is underpinned by key themes which have become even more important in the light of the geopolitical and macro-economic upheavals of 2022. In this environment, Deutsche Bank aims to leverage a more favorable interest rate environment, deploy its risk management expertise to support clients, and allocate capital to high-return growth opportunities. As sustainability becomes ever more important, the bank aims to deepen its dialogue with and support for clients and broaden the agenda in respect of its own operations. As technology continues to evolve, the bank aims to reap further cost savings, accelerate the transition to a digital bank, and expand upon strategic partnerships which are already creating substantial value.

Furthermore, the Group has also announced several key pillars of efficiency measures contributing to Deutsche Bank’s 2025 targets, which are expected to deliver structural cost savings of more than € 2 billion between 2022 and 2025. These include:

- Germany platform optimization: Branch reductions and technology integration of the IT platform aimed at creating efficiencies by simplifying the Group’s infrastructure. The bank recently completed the conversion of around 8 million additional Postbank contracts to the Deutsche Bank IT platform
- Re-architecture and simplification of the Group’s application landscape: In 2022, 9% of the bank’s software applications were decommissioned and more than 400 additional applications are expected to be decommissioned by 2025. Supported by the Group’s cloud-based infrastructure, the bank has also migrated key applications to the cloud and will continue to build on its progress
- Front-to-back process re-design: More automated processes have already delivered tangible results supported by improved controls. The bank plans to continue automating controls and processes, including its front-to-back loans processing, risk management and reporting processes
- The bank has identified additional cost savings in infrastructure efficiency, including optimization of its real estate portfolio, management of its infrastructure workforce as well as other measures. In line with plans announced in March 2022, the bank has optimized office space resulting in a significant reduction of 170,000 square meters in 2022, representing around 6% of the total global footprint. Going forward, Deutsche Bank aims to continue to focus on optimizing the bank’s workforce management

Deutsche Bank’s key performance indicators 2025

Financial targets and capital objectives for 2025

Financial targets:

- Post-tax Return on Average Tangible Equity of above 10% for the Group
- Compounded annual growth rate of revenues of 3.5 to 4.5%
- Cost/income ratio of less than 62.5%

Capital objectives:

- Common Equity Tier 1 capital ratio of approximately 13%
- 50% Total payout ratio from 2025

Deutsche Bank reaffirms its financial targets to be achieved by 2025 of a post-tax return on tangible equity of above 10%, a compound annual revenue growth in revenues of between 3.5% and 4.5% and a cost/income ratio of below 62.5%. The bank also confirms its capital objectives of a CET1 capital ratio of around 13% and a payout ratio of 50% from 2025 onwards.

Deutsche Bank’s financial and regulatory targets are based on the financial results prepared in accordance with the International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB) and endorsed by the European Union (EU). For further details, please refer to the section ‘Basis of preparation/impact of changes in accounting principles’ in this report.

Adjusted costs, Adjusted costs excluding transformation charges as well as Post-tax Return on Average Tangible Equity are non-GAAP financial measures. Please refer to “Supplementary Information (Unaudited): Non-GAAP Financial Measures” of this report for the definitions of such measures and reconciliations to the IFRS measures on which they are based.

Capital distribution

Deutsche Bank is committed to delivering sustainably growing cash dividends and, over time, returning to shareholders excess capital that is over and above what is required to support profitable growth and upcoming regulatory changes through share buybacks, subject to regulatory approval, shareholder authorization and meeting German corporate law requirements. To that end, subject to meeting the Group's strategic targets, the Management Board intends to grow the cash dividend per share by 50 % per annum in the next 3 years, starting from the € 0.20 per share paid for the financial year 2021. This would translate into approximately € 3.3 billion of cumulative dividend payments by 2025 with respect to financial years 2021-2024. In relation to the financial year 2024 the bank intends to achieve a total payout ratio of 50 % from a combination of dividends paid and share buybacks executed in 2025; and the bank intends to maintain a 50 % total payout ratio in subsequent years. In addition to the share buyback of € 0.3 billion already concluded in 2022, successfully executing the Group's financial and strategic plans through 2025 would therefore support the previously announced cumulative distributions to shareholders in the form of dividends paid or share buybacks executed of approximately € 8 billion in respect of financial years 2021-2025. Deutsche Bank's ambition to return capital to shareholders is further underpinned by the bank's aim to maintain a robust Common Equity Tier 1 (CET 1) capital ratio of approximately 13 %, i.e., to operate with a buffer of 200 basis points above the Maximum Distributable Amount (MDA) threshold the Group currently assumes to prevail over time.

Sustainability

Deutsche Bank has seen sustainability as an opportunity for many years. Consequently sustainability, which encompasses environmental, social, and governance (ESG) aspects, is a central component of the "Global Hausbank" strategy. Continuing this strategy, the bank strengthened its sustainability governance by creating the position of the Chief Sustainability Officer in September 2022. The Chief Sustainability Officer has the mandate to develop the bank's sustainability strategy and advance its implementation.

The bank has made significant progress in implementing its sustainability strategy and continued to embed sustainability into its products, policies, and processes, focusing on the following four pillars: Sustainable Finance, Policies & Commitments, People & Own Operations as well as Thought Leadership & Stakeholder Engagement.

- Sustainable finance: It is the bank's objective to be a reliable financial partner for its clients and to support them in their transition
- Policies and commitments: To ensure that the bank's business activities are ESG-compliant and avoid negative impacts
- People and operations: To be the partner of choice, the bank also must lead by example. It means ensuring that it operates in a sustainable way and fosters a culture of diversity and inclusion
- Thought leadership and stakeholder engagement: The bank needs to engage with lawmakers, regulators, investors and the entire society in order to agree on the right standards and frameworks to maximize its positive impact

By implementing Deutsche Bank's sustainability strategy, the bank aims to maximize its contribution to the Paris Climate Agreement and the United Nations' Sustainable Development Goals. The bank formally endorses universal sustainability frameworks and initiatives, such as the UN's Environment Programme Finance Initiative, the UN Global Compact, and the Principles for Responsible Banking.

To implement the Group's sustainability strategy, Deutsche Bank has set sustainability targets to:

- Achieve cumulative sustainable financing and investment volumes since January 2020 of over € 200 billion by the end of 2022 and € 500 billion until by the end of 2025 (excluding DWS)
- Fulfill Deutsche Bank's net zero commitments for key carbon intensive sectors by accompanying clients in their transformation (Transition Dialogue)
- Strengthen policies and controls to guide the bank's actions and ensure compliance
- Source external ESG data, automation, and standardization of reporting
- Empower employees and establish sustainability as core value of the bank's culture

In 2022, the bank continued to deliver on these targets and further pillars of its sustainability strategy. For example, the bank:

- Published the carbon footprint of its corporate loan portfolio and net-zero aligned targets for 2030 and 2050. These targets cover the carbon-intensive sectors of Oil and Gas (Upstream), Power Generation, Automotive (light duty vehicles) and Steel and will significantly reduce the amounts of financed emissions (Scope 3) by 2030, reflecting the bank's commitments as a founding member of the Net-Zero Banking Alliance
- Launched "How we live", a new Corporate Social Responsibility program for environmental impact, aiming to mobilize communities to protect and restore the environment

- Became an official network partner for the German Ocean Decade Committee, after signing a memorandum of understanding to actively support the United Nations Decade of Ocean Science and Sustainable Development
- Announced the new endowed professorship for Sustainable Finance together with the European School of Management and Technology in Berlin, Germany

To reinforce the bank's sustainability ambition, the Management Board's, and other top-executives' variable compensation is tied to sustainability objectives, including the volume for sustainable financing and investments and a sustainability rating index.

Deutsche Bank Businesses

Corporate Bank

Corporate banking is an integral part of Deutsche Bank's business. Firstly, the Corporate Bank's capabilities in Cash Management, Trade Finance and Lending, as well as Foreign Exchange delivered in close collaboration with the Investment Bank, enable the division to serve the core needs of corporate clients. As a leading bank serving multinational and German corporates domestically and abroad, the Corporate Bank helps clients in optimizing their working capital and liquidity, securing global supply chains and distribution channels and managing their risks. Secondly, the Corporate Bank acts as a specialized provider of services to financial institutions, offering Correspondent Banking, Trust and Agency and Securities Services. Finally, the division provides business banking services to small corporate and entrepreneur clients in Germany through a largely standardized product suite.

The Corporate Bank has defined a number of specific initiatives to capitalize on its core competencies across these different areas and grow revenues to achieve its targets. In particular, the division's investments in new initiatives and experience in managing complex situations, such as impacts of COVID-19 pandemics, the war in Ukraine or rising energy costs, for clients has allowed the Corporate Bank to prove its advisory and solution capabilities.

In 2022, the Corporate Bank delivered its best-ever profit before tax of over € 2 billion, with a cost/income ratio of 62% and return on tangible equity of 12%, in line with the division's commitment for 2022. Post-tax return on average shareholders equity was 11.6%. The Corporate Bank continued to make progress on its strategic objectives set out in 2019. The division offset negative interest rates with deposit charging, implemented until mid-2022, followed by carefully managing the transition to a positive interest rate environment. The Corporate Bank expanded its lending proposition with corporate clients across all regions compared to pre-COVID-19 levels with loans at € 122 billion at the end of 2022, increasing selectiveness of its balance sheet deployment at the same time. The division laid foundations for future growth in payments, launching Merchant Solutions products and growing its business with platforms, FinTechs and eCommerce payment providers. Finally, the division focused on the continuous scaling-up of its ESG-related transition dialogue with clients and engagements with external ESG stakeholders in various industry initiatives. The Corporate Bank extended its ESG-enabled product suite and service for MidCorps and Business Banking clients and established a sustainable supply chain finance program to support its clients to drive greater ESG accountability and transparency across their supply chain.

Looking ahead, the Corporate Bank is expected to act as an integral part of the Global Hausbank strategy and contribute to Deutsche Bank's 2025 objectives. The division sees growth opportunities across all core client groups (Corporate, Institutional, Business Banking), both from existing Corporate Bank strengths and from new products. The Corporate Bank's global network across 151 countries combined with profound local knowledge, a comprehensive product suite and tailored client offering, should continue to be its differentiator from competitors for global multinational corporates. The Corporate Bank continues working towards its strategic ambitions, leveraging its strong brand and deep client relationships and aiming to offer a full range of advisory and financing solutions for corporate treasurers. The division wants to remain the trusted partner for the German economy and build on its standing as the leading Corporate Bank in its home market. The division is also committed to connect financial institutions worldwide, a business where it is one of the market leaders.

The Corporate Bank's initiatives will target revenue growth with corporate clients across cash management and payments, including growing its fee-based business with institutional clients and expanding lending. As the division seeks to grow its business with clients globally, it commits to applying sound risk management principles in order to maintain its high-quality loan portfolio and strict lending standards. Equally, the division sees further potential to reduce its cost base from technology and front-to-back process optimization, as well as automation and location strategy.

The Corporate Bank's ambition is also to become a leader in ESG and drive the transition to a sustainable economy by supporting its corporate clients globally. Further developing ESG offerings will be an integral part of the Corporate Bank's approach, building on its tradition on innovations for corporate clients. Additionally, the division expects investments into new products enabling new business models of the real economy, like merchant solutions, to contribute to future sustainable growth.

Investment Bank

The Investment Bank remains core to Deutsche Bank's business. Across Fixed Income, Currency, Sales & Trading and Origination and Advisory, corporate and institutional clients access a comprehensive range of services, encompassing, financing, market making/liquidity provision, risk management solutions, advisory, debt and equity issuance. The division regionally encompasses EMEA, Americas and APAC, with a strategy that is focused upon operating in areas of competitive strength.

In 2022, the Investment Bank continued to execute against its strategic priorities set out in 2019. The Investment Bank's strategy has been focused on controlled revenue growth, capital and cost efficiency and client intensity. During this period, significant progress has been made establishing a well-controlled and balanced portfolio of business, resulting in the strength of financial performance delivered.

The transformation of Investment Bank's Fixed Income & Currencies business has been pronounced, with the growth in revenue and market share reflecting the successful delivery against strategic objectives. A highly competent and experienced management team has been established, which combined with the development of internal resources and strategic hires has created a strong platform and culture focused on conduct in the Investment Bank. Investment into technology has enabled multiple benefits. The reduction of duplicative platforms and applications has decreased complexity and across a significant part of the business, Investment Bank has streamlined multiple data sources into a single system, improving pricing whilst enhancing its control environment. Technology has also been critical in ensuring Investment Bank can monetize pre and post trade activities and has enabled the development of valuable client workflow solutions. Alongside this, a clear and focused client strategy has been developed, with enhancements to Investment Bank's coverage model delivered across its institutional and corporate client bases. The focus upon disciplined risk management has also materially benefitted clients. During the periods of extreme market volatility witnessed over the past three years, the Investment Bank was able to consistently make markets, provide liquidity and act as a critical partner as they navigate increasingly uncertain markets. As a result of Deutsche Bank's recent rating upgrades and the broader strength of the bank, the Investment Bank has seen significant client re-engagement and growth in its associated revenues.

Within Origination & Advisory, the business has made targeted hires to support business in key sectors and regions and has maintained a full-service offering. The focus has been on its core client base, successfully developing deeper strategic relationships, which has resulted in an increased market share of the division with its priority clients in Mergers and Acquisitions and Debt Capital Markets. Importantly, the Investment Bank has also improved its business mix with these clients, with the percentage of advisory revenues increasing. Whilst 2022 was challenging due to the industry wide fee pool decline, the division was able to demonstrate year on year gains in Mergers and Acquisitions market share and has also returned to the #1 rank in its home market according to Dealogic.

As the Investment Bank builds upon the successful execution its strategy since 2019, its strategic objectives remain consistent, with the focus upon targeting specified growth areas. This will continue the enhancement and diversification of the product portfolio and will be aligned with developments in client coverage where the Investment Bank is targeting increased resource efficiency. Within Fixed Income and Currencies, the enhancement of its flow products is ongoing, with investment into product technology development and adjacent businesses. The development of innovative workflow solutions will continue to enhance the risk managing offering for clients. Within Origination & Advisory, investment will be targeted upon specific sectors and the ongoing the development of the Merger & Acquisition franchise, while the division will continue to provide a full capital markets offering across both Debt and Equity Origination. The strategic priorities of cost and capital resource optimization is underpinned by a focus on the control environment.

Finally, ESG remains a priority across the Investment Bank. Although 2022 ESG debt volumes were adversely impacted by market volatility, the Investment Bank continued supporting the division's clients globally. The Investment Bank provided holistic support to the RWE acquisition of Con Edison Clean Energy Businesses for a base purchase price of U.S.\$ 6.8 billion. This was the largest M&A transaction by a German corporate into the U.S. since 2019 (MergerMarket) and the largest equity-linked transaction in 2022 (Dealogic). The Investment Bank also supported sovereigns in inaugural green bond issuances. For example, Deutsche Bank was joint bookrunner for the Republic of Singapore's inaugural SGD 2.4 billion green bond and a joint lead manager and joint structuring advisor for New Zealand's inaugural NZD 3.0 billion green Bond.

Private Bank

The Private Bank is organized along two businesses: Private Bank Germany and International Private Bank. The Private Bank serves personal and private clients, wealthy individuals, entrepreneurs and families. The international businesses also focus on commercial clients. Since 2019, the Private Bank contributed major achievements towards the completion of the 'Compete to Win' strategy at Deutsche Bank. The division refocused its business towards growth leading to new business volumes in 2022 that were nearly three times as high as in 2019. Private Bank was able to restructure its franchise via two legal entity mergers and a significantly reduced branch network. Additionally, the Private Bank reinvigorated its culture by improving the employee feedback while strengthening control systems at the same time. By concluding these steps, Private Bank reached its financial targets as the division reports a significantly improved cost/income ratio of 72% and a return on tangible equity of more than 10% in 2022. Post-tax return on average shareholders equity was 9.6%. These accomplishments were jointly reached by executing the division's strategic agenda in both business units.

Private Bank Germany is Germany's leading private retail bank with two complementary brands, Deutsche Bank and Postbank. The business unit targets clients seeking advisory solutions with Deutsche Bank brand offerings and those looking for convenience through the Postbank proposition. Private Bank Germany serves clients with an omni-channel distribution model, including a nationwide branch network, direct sales, mobile sales and a portfolio of distribution partners.

In Private Bank Germany, the main focus of 'Compete to Win' was to increase the efficiency of its business model. The business unit continued the optimization of its distribution network with the consolidation of more than 100 Postbank branches in 2022. Furthermore, it consolidated head office functions across brands and legal entities. In operations, further synergies were realized through automation and harmonization of processes. Moreover, Private Bank Germany advanced in the consolidation of Deutsche Bank's and Postbank's IT infrastructure through the completion of two significant steps and the migration of approximately 8 million contracts in 2022. Private Bank Germany's profitability was also driven by growth in its customer business in a changed interest rate environment. In deposits, Private Bank Germany sees higher margins and a returning demand for related offerings. In mortgages, the business unit sees a slow-down in housing markets while demand for financing of ESG-compliant modernization is expected to grow.

International Private Bank's vision is to be the house of choice for family entrepreneurs globally. In order to achieve this vision, three strategic propositions were established as part of 'Compete to Win': being the Bank for Entrepreneurs, the partner for ultra-high net worth families globally and being the leading premium bank for affluent clients across Europe with a digitally-led model.

In 2022, the International Private Bank continued to execute against its strategic objectives, despite unprecedented market conditions. The International Private Bank has strong momentum in attracting client inflows with now twelve consecutive quarters of positive net inflows in assets under management. In particular, its flagship strategic asset allocation and strategic income allocation solutions have significantly contributed towards the International Private Bank's net new assets growth. The International Private Bank has increased cost efficiency through a greater focus on the business model. This includes the sale of the Deutsche Bank Financial Advisors business in Italy in 2022 to fund its core business growth. Furthermore, transformation of its branch footprint, consolidation of office space, head office optimization and improvements in IT via platform enhancements and automation have also contributed to reducing costs. The International Private Bank has continued to grow its WM coverage and product teams in key markets supported by entrepreneur-focused strategic hires. Furthermore, the International Private Bank has successfully continued its Premium Banking transformation with investment advisory personalization at scale evolving its business towards an increased demand for digital access to services.

The Private Bank also further substantiated its ESG value proposition for the next years by enhancing the product portfolio and emphasizing its continuous support of clients towards their sustainable transition. Consequently, the Private Bank established a dedicated Chief Investment Office ESG to implement a holistic perspective and positioning across its division. Within its business units, Private Bank Germany finalized the rollout of its ESG advisory concept to all 400 Deutsche Bank branches and seven regional advisory centers. In 2023, it will set focus on energy efficient refurbishment to enable clients to align their properties with the low-emission economy of the future. In the International Private Bank, product realignment and new launches of ESG-specific solutions were key topics throughout the year, with the ESG transition of its flagship 'Strategic Asset Allocation' as a major step towards a more sustainable product offering. In 2023, the International Private Bank will focus on expanding its ESG product range even further with impact, thematic and asset class solutions which meet client needs.

The Private Bank's achievements throughout 2022 and the 'Compete to win' journey enabled the division to further strengthen its position towards its 2025 ambition to achieve a cost-income ratio of 60-65% and an annual revenue growth of 4-5%.

Asset Management

Asset Management principally consists of DWS Group GmbH & Co. KGaA. DWS aspires to be one of the world's leading asset managers with € 821 billion in assets under management as of December 31, 2022.

With approximately 3,800 employees operating globally, DWS provides a range of active, passive and alternative investment capabilities to clients worldwide. Investment offerings span all major asset classes including active equity, fixed income, cash and multi asset and systematic and quantitative investments as well as alternative and passive investments including the Xtrackers range. Product offerings are distributed across EMEA, the Americas and APAC through a global distribution network, also leveraging third party distribution channels. DWS serves a diverse client base of retail and institutional investors globally, with a strong presence in its home market in Germany. Clients include government institutions, corporations and foundations as well as individual investors.

With the market environment becoming increasingly uncertain and client expectations evolving, DWS has refined its strategy with a goal of growing long-term shareholder value. It aims to maintain its leading position in Germany and further capture upside in Europe by building additional partnerships, growing its Passive business and leveraging its Alternatives capabilities to participate in the European transformation. In the Americas DWS aims to expand its Passive and Alternatives businesses and in Asia Pacific focus on its strategic partnerships. Within its strategy, DWS remains committed to sustainability with a focus on climate and stakeholder engagement.

DWS has reassessed its opportunities and has assigned its lines of business into four key strategic clusters categorized by the differentiation of its capabilities and the market growth potential: Growth (expanding areas of strength in Passive, built around the Xtrackers brand, and Alternatives), Value (build and grow capabilities in Equity, Multi-Asset and Fixed Income), Build (leverage digital trends and translate into new digital products and solutions) and Reduce (reallocate financial resources to fund investments into Growth areas).

DWS has identified five key enablers to support the execution of its strategic objectives. These are: expanding distribution partnerships, continuing to leverage collaboration with DB Group, enabling business by migrating to cloud and streamlining data management, creating a diverse culture to drive strong performance for clients and building on a diversified management team with focus on execution.

In December 2022 and as part of the refined strategy, DWS announced new medium-term financial targets to be delivered over the next three years: DWS is committed to creating shareholder value, reflected in the introduction of an earnings per share target of € 4.50. DWS remains disciplined on cost, to be measured and controlled by the adjusted cost/income ratio target of below 59% by 2025. Reflecting its AuM growth strategy, DWS has set for assets under management a compound annual growth rate target of greater than 12% for Passive including Xtrackers and greater than 10% for Alternatives.

DWS is further refining its approach regarding sustainability to better meet the evolving needs of its stakeholders – most importantly its clients. In this context, DWS remains committed to sustainability with a focus on climate and stakeholder engagement. As an integral part of its overarching strategy, its sustainability strategy is anchored around four strategic priorities: 1) Corporate Transformation: continue to seek to increase the level of sustainability associated with its activities throughout its organization, 2) ESG in the Investment Process: to seek to further embed ESG considerations into its investment process, that are designed to improve the assessment of the future expected risk and return of an investment, 3) Innovative and Sustainable Investment Solutions: to seek to launch new and innovative ESG products and solutions across asset classes to meet the requirements of its clients and 4) Stakeholder Engagement: to seek to take a holistic and systematic approach to engagement with key stakeholders across the entire investment value-chain.

The Competitive Environment

With the war in Ukraine, the risk focus and thus the economic environment changed abruptly in 2022, whereas until then the key focus had been on the COVID-19 pandemic. The pandemic improved rapidly in 2022, particularly in developed countries, as immunization progressed. In contrast, the economic impact of the war in Ukraine on Europe in particular, but also globally, gained in intensity. Prices for fossil fuels, other raw materials and food rose sharply, driving inflation to record highs. In Europe, the supply situation for fossil fuels underwent a significant change during the year. At the end of the year, it was a decisive factor in supporting economic development and preventing a deep recession at the end of the year.

Global GDP growth in 2022 weakened more than expected at the beginning of the year due to the economic impact of the war in Ukraine and the ongoing and in some cases stringent COVID measures in some countries. Global economic growth slowed from 6.2% in 2021 to 3.2% in 2022. Global inflation rose to 8.7% in 2022. In the developed countries, GDP grew by 2.7% and consumer price inflation climbed to 7.4% in 2022, while GDP of emerging market economies expanded by 3.6% and inflation reached 9.5% in 2022.

Eurozone GDP growth was significantly better than expected in 2022, despite the purchasing power shock from high inflation. A strong labor market, rising wages, fiscal easing, credit growth and absorption of excess savings lead to robust household demand. Energy prices pushed the inflation rate to a record high in the fourth quarter. Annual GDP increased by 3.4% and inflation accelerated to an annual average of 8.4% in 2022 from 2.6% in 2021. The ECB raised key interest rates significantly in order to curb the inflation momentum.

The German economy adapted to geopolitically driven shifts in the supply of fossil fuels. Gas rationing did not occur as previously expected, and storage levels developed favorably. Consumer price inflation rose sharply and marked an all-time high during the second half of 2022. However, fiscal measures prevented a more severe slump in growth, although momentum slowed toward the end of 2022. The labor market was a factor of stability. German GDP expanded by 1.9% in 2022. Consumer price inflation rose to an annual average of 7.9% from 3.1% in 2021.

Although the U.S. economy expanded at a relatively modest rate of 2.1% in 2022, the labor market has proven remarkably resilient and remained historically tight. Inflation picked up strongly during the year to an annual rate of 8.0% from 4.7% in 2021. The U.S. Federal Reserve (the "Fed") tightened its monetary policy very much to break the dynamic inflation momentum.

After the Japanese government eased its strict pandemic measures, domestic demand gained momentum. With the easing of entry regulations, tourism also picked up again. Thus, GDP expanded by 1.1% in 2022 and inflation rose to 2.5% from (0.2)% in 2021. The Bank of Japan supported the recovery with its expansionary monetary policy.

The Asian economies continued to expand, but at a somewhat slower GDP growth rate of 4.2% in 2022. The quite favorable development of overseas trading partners was a positive factor, as was the nonetheless subdued recovery of the Chinese economy. Asian consumer price inflation rose to 3.8% in 2022 but is expected to have peaked at the end of the year. Central banks continued to tighten monetary policy.

In 2022, China's economy was heavily burdened by the zero COVID policy. This has led to frequent mobility disruptions, rising fiscal costs, weakening consumer sentiment, and, consequently, low economic growth. GDP growth slowed to 3.0% in 2022 and inflation accelerated to 2.0% in 2022 from 0.9% in 2021.

2023 Outlook

At the beginning of 2023, some economic parameters are showing signs of improvement. The easing of the energy shock in Europe and far-reaching withdrawal of COVID-19-related restrictions in China is expected to provide a tailwind, while the expected U.S. recession could present headwinds. The world's central banks are expected to continue to support the global economy in 2023 with further tightening measures to combat inflation. Lower energy prices combined are expected to dampen inflation momentum. Global GDP is expected to grow by 2.7% in 2023. The global inflation rate is expected to slow to 6.5% from 8.7% in 2022.

For developed countries, GDP is expected to grow by 0.7% and consumer prices to increase by 4.4% in 2023 from 7.4% in 2022. Economic growth in emerging markets is projected to reach 3.6% in 2023, while inflation is expected to decelerate to 7.9% from 9.5% in 2022. The European regions in particular are affected by the economic spillovers of the war in Ukraine. In Asia, on the other hand, the reopening of China is likely to be the determining factor. Lower energy prices are likely to cause inflationary momentum to ease further. Central banks are expected to have passed the peak of their monetary tightening.

GDP growth in the Eurozone is expected to slow down to 0.5% in 2023. In particular, the fading energy shock and favorable gas storage levels should help avoid a deeper downturn. Fiscal support and further easing of supply constraints cushion real income decline. Nevertheless, inflation is likely to be well above the European Central Bank target at an annual average of 5.8% in 2023. Continued monetary tightening is expected in the first half of the year. Headwinds from a US recession would be an additional drag.

German GDP is expected to stagnate in 2023. Due to favorable gas storage levels and broad fiscal support, the slowdown at the start of the year is expected to be relatively mild. Weakening global trade and the expected U.S. recession are likely to become headwinds to the recovery. Inflation is expected to decelerate to 6.5%, not least due to lower energy prices and strong base effects, but still remain at a high level on average for the year 2023. A robust labor market and mitigating supply constraints are expected to support growth momentum.

As a result of the Federal Reserve's strong monetary tightening, the growth momentum of the U.S. economy is expected to slow down significantly in 2023. At least a slight recession cannot be ruled out in the second half of the year. The economy is expected to expand by only 1.1%. Inflation is likely to have peaked, but with an expected annual average of 3.6%, down from 8.0% the year before, it should still be above the Fed's target in 2023. A weaker labor market is expected to play a key role in moderating inflation pressures. The Fed is expected to tighten its monetary policy somewhat further in early 2023.

GDP growth of the Japanese economy is expected to slow to 1.0% in 2023 on the overseas slowdown. Domestic demand has the potential to recover, as pandemic restrictions were only eased late in 2022. The cross-industry wage bargaining cycle could result in strong wage gains. Inflation is expected decelerate to 2.1% from 2.5% in 2022. The BoJ adjusted its policy framework, but it expected to maintain an accommodative policy stance.

In 2023, China's GDP growth rate is expected to rebound to 6.0% as China has eased its strict COVID-19 policies. Reopening will likely also help boost housing demand. Property market policies have already eased substantially and are no longer constraining the recovery. Both fiscal and monetary policy are likely to maintain their easing bias in 2023. Consumer price inflation is expected to accelerate somewhat to 2.5%, from 2.0% in 2022.

There are number of risks to Deutsche Bank's global economic outlook. Geopolitical risks remain elevated in Ukraine, and U.S. versus China strategic competition will possibly continue to intensify. Although there is tentative evidence of a peak, inflation is still at undesirably high levels, and both the Fed and ECB are unlikely to tolerate higher inflation. If inflation fails to recede, it could lead the central banks to a more aggressive tightening stance, potentially causing a sharply negative reaction in financial markets and most likely an economic recession. A U.S. recession is expected in the second half of 2023, but there is a risk that it may come earlier.

Competitor Landscape

Against this backdrop, Deutsche Bank competes in the financial services sector with a wide variety of competitors, who include other universal banks, commercial banks, savings banks and other public sector banks, broker dealers, investment banking firms, asset management firms, private banks, investment advisors, payments services providers, financial technology firms and insurance companies. Some of the competitors are global like Deutsche Bank, while others have a regional, product or niche client footprint. Deutsche Bank competes on a number of factors, including the quality of client relationships, transaction execution, products and services, innovation, reputation and price.

In 2022, the European banking industry benefited substantially from the sudden surge in interest rates due to rapidly rising inflation. Net interest income jumped by double-digits, driving total revenues higher. On the other hand, inflation and increased regulatory costs also impacted operating expenses though loan loss provisions edged up, from low levels. Together with one-off hits, this led to a moderate decline in post-tax profits. Corporate lending in the euro area boomed, due to higher working capital needs and demand for liquidity in times of war and looming recession. Mortgage lending peaked in summer and slowed subsequently, as higher rates curtailed housing affordability. Banks' liquidity holdings at central banks plateaued. Corporate finance activity slumped compared to the record-breaking prior year, yet trading remained buoyant. European banks' capital ratios decreased as a result of higher risk-weighted assets and large distributions to shareholders, but capital and liquidity ratios nevertheless stayed strong.

The global banking industry may continue to benefit from normalized and further rising interest rates in 2023. This is expected to help strengthen net interest margins, despite funding costs also creeping up. Likewise, inflation dynamics will have an impact on growth in operating expenses. Following a lending surge last year, credit demand both for mortgages as well as corporate loans may abate due to higher rates and subdued economic growth in most major countries. Asset quality could weaken slightly but should remain very robust overall. Loan loss provisions could edge up, from low levels. Absent further shocks, capital market volatility and trading activity could decrease, while corporate finance momentum could pick up following headwinds in the past year. Banking sector profitability, and returns to shareholders, could remain strong. Banks in Europe are expected to benefit more than their peers in other regions from the removal of negative interest rates and the fact that interest rates will continue to rise more and for longer than elsewhere. On the other hand, downside risks from the war in Ukraine and the energy crisis are also more pronounced. Banks' funding position should normalize further, with the expiration in June of a large tranche of the ECB's TLTRO III programme and banks' greater reliance on market and customer funding. Capitalization levels are likely to stay strong even though fully loaded regulatory requirements might increase once EU policymakers have agreed on the implementation of final Basel III rules. In the U.S., the benefits of higher interest rates could taper off earlier than in Europe but should still be meaningful in 2023. A rebound in capital market issuance and Merger & Acquisition activity could potentially support investment banks. Banks in China and Japan will probably lack Western banks' tailwind from rising interest rates. At least, the accelerating recovery of the Chinese economy from the coronavirus pandemic may help Chinese banks' performance.

In Deutsche Bank's home market, Germany, the retail banking market remains fragmented and the competitive environment is influenced by the three pillar system of private banks, public banks and cooperative banks. Competitive intensity overall has increased in recent years following some consolidation activity, particularly among public regional banks (Landesbanken) and private banks, and increased activity levels from foreign players.

Looking at the wider banking ecosystem, the evolution of financial technology firms remains as much an opportunity as a challenge for banks. While the bank sees the risk of banking disruption primarily through big technology companies and in select product areas, particularly the unregulated segments, some banks have also taken the opportunity to selectively partner with financial technology firms and leverage their solutions to become more efficient and/or develop differentiated delivery channels for end clients.

Regulatory Environment

The flow of new legislative proposals under the post-crisis global regulatory reform agenda gained new traction, with a drive to implement and review previous reforms, while there were limited regulatory measures linked to the war in Ukraine. During 2022, a number of international developments in the area of banking regulation and supervision have been implemented and will continue to be further refined, in particular with a view to strengthening international standards to create financially resilient institutions and ensuring the resolvability of banks. In addition to "traditional" banking regulation and supervision, environmental, social and governance matters, as well as the developments related to crypto assets and new technologies such as the distributed ledger technology, have become a new legislative focus that will also affect banks as these rules are being implemented and further developed.

Capital, liquidity and leverage requirements – While the European Central Bank ("ECB") temporarily allowed banks to operate below the level of capital defined by the Pillar 2 guidance ("P2G") during the COVID-19 pandemic, banks are expected to operate again above P2G since January 1, 2023. Further, effective as of February 1, 2022, the German Federal Financial Supervisory Authority ("BaFin") set the domestic countercyclical capital buffer ("CCyB") at 0.75 % and banks have to comply with this CCyB requirement since February 1, 2023. Also, effective as of April 1, 2022, BaFin set a systemic risk buffer ("SyRB") of 2 % with regard to residential real estate financing that applies since February 1, 2023.

On October 27, 2021, the European Commission published a comprehensive package of reforms with respect to European Union banking rules (the "Banking Package 2021") to ensure that banks become more resilient to potential future economic shocks while contributing to the European Union's recovery from the COVID-19 pandemic and its transition to climate neutrality. The proposals aim to amend the Capital Requirements Regulation ("CRR"), the Capital Requirements Directive ("CRD") and the Bank Recovery and Resolution Directive ("BRRD"). If adopted, the proposals to amend the CRR and CRD (commonly referred to as "CRR III" and "CRD VI") will, in particular, finalize the implementation of the Basel 3 framework in the European Union and also fully implement the market risk capital changes in the Fundamental Review of the Trading Book ("FRTB"). Another separate proposal entails combined amendments to the CRR and the BRRD with respect to the resolution regime.

CRR III and CRD VI include, among other things, a gradually introduced output floor establishing minimum risk-weighted assets that will ultimately be set at 72.5 % of the risk-weighted assets calculated under the standardized approach, changes to standardized and internal ratings-based approaches for determining credit risk, changes to the credit valuation adjustment, a revision of the approaches for operational risks and reforms to the market risk framework as set out in the FRTB, adjustments to the Pillar 2 requirements ("P2R") and the SyRB and a "fit-and-proper" set of rules for the senior staff managing banks. Other proposed measures are aimed at addressing sustainability risks by requiring banks to identify, disclose and manage environmental, social and governance risks as part of their risk management framework and include regular climate stress testing by the banks' supervisors. The proposal does not entail any adjustments to the capital requirements for green or brown assets. However, the European Commission has already stated that it is exploring this idea and has asked the European Banking Authority ("EBA") to assess possible adjustments. It is expected that the EBA will provide its final report by mid-2023. Depending on the outcome of the negotiation, CRR III and CRD VI may include provisions on the capital treatment of crypto assets, as described below in the section "Digital Transformation". It remains to be seen to what extent that will follow the already-published standards by the Basel Committee on Banking Supervision.

The proposals regarding the resolution regime include clarifications with respect to some aspects of the total loss absorbing capacity ("TLAC") / minimum requirement for own funds and eligible liabilities ("MREL") regime in relation to single point of entry and multiple point of entry resolution strategies and, in particular, a deduction regime requiring intermediate parents to deduct from their own internal MREL capacity the amount of their holdings of internal MREL eligible instruments, including own funds, issued by their subsidiaries belonging to the same resolution group.

The Banking Package 2021 will continue to be negotiated with EU lawmakers, i.e. the European Parliament and the Council. The Council reached its position on the implementation of the Banking Package 2021 in November 2022, and the European Parliament reached its position in February 2023. The position of the European Parliament entails, in particular, an amendment that would require banks to apply a risk-weighting of 1,250% of capital to crypto asset exposures. It is expected that CRR III and CRD VI will start entering into force at the end of 2023 at the earliest with the new rules implementing Basel 3 to apply from January 1, 2025. According to an assessment conducted by the EBA, the full implementation of the Basel 3 framework in the European Union could lead to an increase in the minimum capital requirements of all European banks of 10.7 % and 20 % for global systemically important institutions ("G-SIIs").

The implementation of the remaining outstanding proposals under Basel 3 as contained in the Banking Package 2021 has the potential to increase Deutsche Bank's risk-weighted assets and will likely affect its business by raising its regulatory capital and liquidity requirements and by leading to increased costs.

In parallel, the UK Prudential Regulation Authority ("PRA") released for consultation its proposal to implement the Final Basel 3 reform on November 30, 2022. Overall, the PRA said it expected its implementation to have an impact of 6% on additional capital for UK banks. The U.S. was planning to release proposals to implement such reforms as well, expected to be published in the first quarter of 2023.

Capital planning and stress testing – The European Central Bank ("ECB") carried out a climate risk stress test to evaluate the financial system's resilience to climate risks and published the results. The results of this stress test will be reflected in the annual ECB Supervisory Review and Evaluation Process ("SREP"). The ECB explained that banks' capital will not be directly impacted through the P2G in 2022, but the ECB provided individual feedback to banks and said it expected action to be taken in response in line also with the set of best practices, which were published on December 19, 2022.

The next EU-wide stress test will be carried out in 2023 and the EBA plans to publish the results for the individual banks by the end of July 2023. The EBA will coordinate the EU-wide stress test in cooperation with the ECB and national supervisory authorities. A total of 99 directly supervised banks, including Deutsche Bank, will be stress tested by the ECB which announced that it will carry out a deep dive on leveraged finance exposures for selected banks with material leveraged finance activities. The adverse scenario used in the test is based on a narrative of hypothetical heightened geopolitical tensions, with high inflation and higher interest rates having strong adverse effects on private consumption and investments, both domestically and globally. In terms of GDP decline, the 2023 adverse scenario is the most severe used in the European Union wide stress testing up to now. The stress test results will be used to update each bank's P2G and can also affect their P2R in the context of the SREP discussed in greater detail under "Regulation and Supervision – Supervisory Review and Evaluation Process" below.

DB USA Corporation and DWS USA Corporation are each subject, on an annual basis, to the Federal Reserve Board's supervisory stress testing and capital requirements. DB USA Corporation and DWS USA Corporation are also subject to the Federal Reserve's Comprehensive Capital Analysis and Review ("CCAR"), which is an annual supervisory exercise that assesses the capital positions and planning practices of large bank holding companies and intermediate holding companies. On June 23, 2022, the Federal Reserve Board publicly released the results of its annual supervisory stress test, which showed that DB USA Corporation and DWS USA Corporation would continue to have capital levels above minimum requirements even under the stress test's severely adverse scenario. DB USA Corporation and DWS USA Corporation submitted their annual capital plans in April 2022 and will make their next capital plan submissions to the Federal Reserve Board in April 2023. On August 4, 2022, the Federal Reserve Board announced a stress capital buffer for each CCAR firm based on 2021 supervisory stress testing results, which for DB USA Corporation was 4.5 % and for DWS USA Corporation was 8.7 %. This stress capital buffer became effective October 1, 2022 and remains in effect until September 30, 2023, at which point the size of the buffer for each of Deutsche Bank's intermediate holding companies will be recalibrated based on the results of the 2023 stress tests, which are expected to be released in June 2023.

Recovery and resolution – The major jurisdictions where Deutsche Bank has significant group operations have now finalized the implementation of the FSB's Key Attributes for Effective Resolution Regimes. Under the European Union's Single Resolution Mechanism, to which Deutsche Bank is subject, resolution authorities have far-reaching powers to impose resolution measures upon banks that are deemed to be failing or likely to fail. Resolution measures, in particular, include the power to reduce, including to zero, the nominal value of shares, or to cancel shares outright, and to write down certain eligible subordinated and unsubordinated unsecured liabilities, including to zero, or convert them into equity (commonly referred to as "bail in"). To ensure sufficient availability of liabilities with loss-absorbing capacity that could be bailed in, banks in the European Union must meet, or will have to meet, certain minimum requirements such as TLAC or MREL.

For a bank directly supervised by the ECB, such as Deutsche Bank, the Single Resolution Board ("SRB") draws up the resolution plan, assesses the bank's resolvability and may require legal and operational changes to the bank's structure to ensure its resolvability.

In the United States ("U.S."), Deutsche Bank AG is required under Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), as amended, to prepare and submit to the Federal Reserve Board and the Federal Deposit Insurance Corporation ("FDIC") either a full or targeted resolution plan (the "U.S. Resolution Plan") on a timeline prescribed by such agencies. The U.S. Resolution Plan must demonstrate that Deutsche Bank AG has the ability to execute and implement a strategy for the orderly resolution of its designated material U.S. entities and operations. For foreign-based companies subject to these resolution planning requirements such as Deutsche Bank AG, the U.S. Resolution Plan relates only to subsidiaries, branches, agencies and businesses that are domiciled in or whose activities are carried out in whole or in material part in the U.S.

Deutsche Bank AG filed its most recent U.S. Resolution Plan in December 2021. This targeted resolution plan submission provides detailed information on Deutsche Bank's U.S. Resolution Strategy, its resolution capabilities in the U.S., material changes made to its U.S. Resolution Plan since the last full submission in 2018, as well as certain additional information. Deutsche Bank AG received regulatory feedback on its December 2021 filing on December 16, 2022. The Federal Reserve and FDIC did not find any shortcomings or deficiencies in Deutsche Bank's 2021 filing, but they identified areas where further progress would help improve Deutsche Bank's resolvability. Deutsche Bank's next full U.S. Resolution Plan is due in 2024.

Loss-absorbing capacity – Following the FSB's final term sheet on TLAC in November 2015, several jurisdictions have started to implement the TLAC standard in their regulatory frameworks. The TLAC standard is designed to ensure that global systemically important banks ("G-SIBs"), such as Deutsche Bank, maintain enough capital and long-term debt instruments that can be effectively bailed-in to absorb losses and recapitalize the bank. The EU has already implemented the FSB's TLAC standard for G-SIBs by introducing a "Pillar 1" MREL for G-SIBs (the European equivalent term for G-SIBs). This requirement is based on both risk-based and non-risk-based denominators and is set at the higher of 18 % of total risk exposure and 6.75 % of the leverage ratio exposure measure. It can be met with Tier 1 or Tier 2 capital or debt that meets specific eligibility criteria. In addition, the competent authorities will have the ability to impose a TLAC add-on requirement on G-SIBs. The European Commission's legislative proposals of October 27, 2021 include clarifications with respect to some aspects of the TLAC / MREL regime in relation to single point of entry and multiple point of entry resolution strategies and, in particular, a deduction regime requiring intermediate parents to deduct from their own internal MREL capacity the amount of their holdings of internal MREL eligible instruments, including own funds, issued by their subsidiaries belonging to the same resolution group. Deutsche Bank is also subject to TLAC requirements in other jurisdictions. For example, the Federal Reserve Board's rules implementing the TLAC standard in the United States are effective as of January 2019, with TLAC requirements that apply to U.S. intermediate holding companies (such as Deutsche Bank's) of non-U.S. G-SIBs. These rules include a minimum TLAC requirement and TLAC buffer, a minimum long-term debt requirement and clean holding company requirements.

Central Clearing Counterparties (“CCPs”) – On February 8, 2022, the European Commission published the extension of their temporary equivalence decision for UK CCPs to June 30, 2025. Until the expiry of the temporary equivalence decision, the European Commission will continue to focus on measures to channel clearing services in EUR-denominated products to EU CCPs.

In this context, on November 7, 2022, the European Commission published a legislative package with respect to clearing services (the “Clearing Package”) that entails a proposal for a review of the European Market Infrastructure Regulation (EMIR) that is accompanied by targeted amendments to other European laws like the CRR and the CRD. The Clearing Package aims to make EU CCPs more competitive, to channel clearing in EUR denominated instruments to EU CCPs and to enhance the existing supervisory framework.

Furthermore, the existing transition period for third-country CCPs (“TC-CCPs”) which allows them to be classified as qualifying CCPs for capital allocation purposes without a formal equivalence decision by the European Commission and recognition by the European Securities and Markets Authority (“ESMA”), the European securities regulator, expired on June 28, 2022. ESMA has started processing the applications for recognition of TC-CCPs that are established in jurisdictions for which equivalence decisions by the European Commission have been made by June 28, 2022. For all other TC-CCPs, ESMA initially refused their applications for recognition but stated that it will re-assess any applications should there be new developments concerning relevant equivalence decisions. However, TC-CCPs may reapply for recognition in the future should an equivalence decision be adopted. As part of the reassessment of TC-CCPs, more particularly, Indian and EU authorities need to sign a Memorandum of Understanding (“MoU”) which would allow EU clearing members to continue to clear via Indian CCPs. ESMA has set a deadline of April 30, 2023 before which this MoU needs to be signed. If no MoU has been signed by then, Indian CCPs will be derecognized after this date. BaFin has published a statement on February 17, 2023, allowing German credit institutions including Deutsche Bank the possibility to remain members of six Indian CCPs for a period of 18 months, up until October 31, 2024.

Capital Markets Union – On November 25, 2021, the European Commission published four legislative proposals to further the aims of the Capital Markets Union (“CMU”) as set out in the 2020 CMU Action Plan, including proposals on the Markets in Financial Instruments Regulation and Directive (MiFIR and MiFID). The other proposals include amendments to the Alternative Investment Fund Managers Directive (AIFMD), the European Long-Term Investment Fund (“ELTIF”) Regulation, and a regulation to set up the so-called European Single Access Point (“ESAP”). Key elements of the proposals focus on supporting the market making abilities of European banks, in particular, by granting them access to UK derivatives trading venues, enhancing the framework for a Consolidated Tape (CT) for aggregated trade information across all execution venues in the European Union, and developing an ESAP so that investors can access financial and sustainability-related information in one place. The impact of such proposals will depend on their final calibration, as the main parts of the package will be negotiated by the Council and the European Parliament in the first half of 2023. The co-legislators already agreed on the amendments to the ELTIF Regulation and it is expected that the legislative process will be finished in March 2023.

On November 7, 2022, the Commission published further proposals in connection with the CMU, that are referred to as the Listing Package and the Corporate Insolvency Package. The Listing Package aims to encourage companies to get and remain listed on EU stock exchanges and allow easier access to funding. The Corporate Insolvency Package aims to harmonize specific aspects of insolvency proceedings across the EU to facilitate cross-border investment. Both proposals will now be reviewed by the Council and the European Parliament before they enter into political negotiations. The negotiations are not expected to start before the second half of 2023.

Benchmarks – Most LIBOR settings ceased by the end of 2021, with the remaining tenors of USD LIBOR set to cease by the end of June 2023. Regulators have since developed “tough legacy” solutions and finalized legislation and authorities’ powers to implement replacement rates in their respective jurisdictions. In the EU, amendments to the Benchmarks Regulation included the creation of new powers for the European Commission to designate statutory replacement rates, as well as an extension of the transition period for the third country benchmarks regime until the end of 2023. The European Commission has since exercised its new powers in October 2021, designating SARON compounded in arrears and ESTR plus 8.5 basis points as the statutory replacement rates for CHF LIBOR and EONIA, respectively. The statutory replacement rates entered into force on January 3, 2022.

The UK Financial Conduct Authority (FCA) received new powers to mandate the publication of synthetic versions of LIBOR under the Critical Benchmarks (References and Administrators’ Liability) Act which was finalized in December 2021. The Act is intended to ensure that the FCA can provide continuity for certain LIBOR rates, ensuring that parties to contracts which could not be transitioned to an RFR before the end of 2021 are able to continue to apply LIBOR to their contracts.

In the U.S., the Adjustable Interest Rate (LIBOR) Act was signed into law by President Biden on March 15, 2022. The Act provides a clear federal solution for transitioning legacy contracts that either lack, or contain insufficient, contractual provisions to transition from LIBOR to a replacement rate. The Federal Reserve Board has also adopted the final rule that implements this Act, which establishes benchmark replacements for contracts governed by U.S. law that reference certain tenors of USD LIBOR that do not have suitable fallback provisions after June 30, 2023.

Digital Transformation – Several jurisdictions progressed initiatives in 2022 to both address risks and capitalize on the benefits associated with the digitalization of financial services and address the growing dependence on so-called critical third parties. Work in this area is expected to continue in 2023 with a focus on data protection, e-privacy, cybersecurity, operational resilience and capital treatment of crypto assets.

On September 24, 2020, the European Commission published its Digital Finance Strategy, which outlined regulatory priorities and policy actions through 2024. The strategy was published alongside legislative proposals to strengthen and harmonize financial sector operational resilience requirements (proposal for a Digital Operational Resilience Act (“DORA”) and a complementing amending directive) and to establish a regulatory framework for crypto assets (proposals for regulations on markets in crypto assets (“MiCA Regulation”) and on a pilot regime for market infrastructures based on distributed ledger technology (“DLT Pilot Regulation”)). DORA and the complementing directive were finalized in 2022, will apply from January 17, 2025, and introduce a comprehensive framework setting out rules on the digital operational resilience for all regulated financial institutions throughout the European Union. It is expected that the MiCA Regulation, which will regulate the issuance and trading of crypto assets as well as the management of the underlying assets, will enter into force in early 2023 and apply from spring 2024. The DLT Pilot Regulation already entered into force and will apply from March 28, 2023, creating a legal framework for the trading and settlement of distributed ledger technology based financial instruments.

On December 16, 2020, the European Commission also published a new Cybersecurity Strategy to bolster Europe's collective resilience against cyber threats and help to ensure that all citizens and businesses can fully benefit from trustworthy and reliable services and digital tools. The publication was accompanied by a draft directive on the resilience of critical entities (“CER Directive”) and a proposal for a revised directive on measures for high common level of cybersecurity across the European Union (“NIS 2”) that aim at adapting online and offline security requirements in response to growing interconnectedness and digitalization. The CER Directive and NIS 2 entered into force on January 16, 2023, and the Member States will have to comply with each directive by October 17, 2024.

New proposals put forward by the European Commission in 2022 included the draft of the so-called Data Act, which covers a variety of aspects such as a general framework for third-party access to information generated by connected devices, ad-hoc data requests from public authorities and international transfer of and access to non-personal data. Additionally, the European Commission proposed a legislative action that aims to make instant payments in euro available to all citizens and businesses by amending the Single Euro Area Payments (SEPA) Regulation and the regulation on cross border payments. Also, while the negotiations on the proposed so-called Artificial Intelligence (“AI”) Regulation continue, the European Commission proposed an overhaul of the European liability framework differentiating between general product liability now including software and specific rules for artificial intelligence (proposals for the so-called AI Liability Directive and the revised Product Liability Directive). The aim of the update is to close existing gaps in light of the increase of digital products and make it easier for consumers to seek redress. Overall, 2022 showed an increase of horizontal legislative initiatives on digital issues which will apply to financial services as well and add to the complexity of the regulatory framework.

In addition, the European political and regulatory landscape is increasingly driven by a desire to increase “digital sovereignty”. This goal translates into active support for European initiatives in the field of digital identities and cloud services, while at the same time it leads to greater scrutiny of non-European technologies and respective providers, including calls for onshoring of data and services.

Aligned with the majority of central banks globally, the European Central Bank launched an investigation project for the potential launch of a digital euro as a new form of digital central bank money to the wider public. The project is foreseen to publish initial results in Q3 2023 as a preparation for further decision-making. The Bank of England and the U.S. Federal Reserve conduct similar analysis since 2021 but have not officially committed any timelines.

Work by UK and U.S. authorities focused on cloud services and the role of third-party service providers that are not regulated financial entities, but whose service provision is critical to the functioning of the financial market (CTPs). To that end, the UK Financial Conduct Authority (FCA) and the Bank of England (BoE) jointly consulted on a future direct oversight framework for CTPs. The U.S. Treasury at the same time assessed the current regulatory framework and need for action on cloud regulation in the U.S.

In terms of crypto assets, stable coins and decentralized finance, the UK, U.S. and New York state authorities continue their scrutiny and provide supervisory guidance to consumers and the financial industry. The ability for banks to be able to engage in digital asset activities will vary depending on the stances taken within each jurisdiction and this may limit Deutsche Bank's ability to engage in these activities. Discussions regarding the required policy frameworks required to address the risks and opportunities of digital assets have increased due to numerous insolvency and fraud cases related to individual crypto assets or platforms.

U.S. authorities have increased scrutiny of crypto-asset activities, particularly following several high-profile insolvency and fraud cases concerning crypto-asset intermediaries in 2022. The FDIC, Federal Reserve Board, OCC and the New York State Department of Financial Services (DFS) have each issued guidance requiring banks regulated by them to provide written notice to them to engaging in any crypto-asset-related activity. The federal banking agencies and the DFS have further signaled through guidance, public statements and other actions that all crypto-asset-related activities will be heavily scrutinized.

Anti-Money Laundering and Other Financial Crime – The political negotiations on the European Commission’s anti-money laundering (“AML”) and countering the financing of terrorism (“CFT”) legislative package (referred to as the “AML/CFT Package”) from July 2021 continued throughout 2022. This package contained a regulation on AML/CFT containing directly applicable rules (“AML Regulation”), a sixth directive on AML/CFT (“AMLD 6”), a regulation establishing the EU AML/CFT Authority (“AMLA”), and a Regulation on Information accompanying transfers of funds and certain crypto assets (“FTR Recast”). The key element of the AML/CFT Package is the establishment of an integrated European AML supervisory system closely involving national supervisors and the newly to be established EU AML Authority (“AMLA”) as well as the creation of a unified AML/CFT regulatory framework which includes directly applicable AML/CFT rules and requirements throughout the EU (so called single EU rulebook). Once the package is implemented, AMLA will directly supervise a small number of cross-border financial sector entities in the highest risk category, facilitate cooperation among financial intelligence units and coordinate national authorities. The single rulebook expands the list of obliged entities and includes harmonized, more detailed and granular rules, among other things, in the area of customer due diligence, beneficial ownership, and AML/CFT risk management.

On June 29, 2022, the Council of the EU adopted its partial position on the proposal for the creation of the new AMLA as well as its position on the final text of the FTR Recast which will extend traceability requirements to crypto asset transfers. On AMLA, a major open question is the future location of the authority, which will directly supervise a small number of cross-border financial sector entities in the highest risk category, facilitate cooperation among financial intelligence units and coordinate national authorities.

While the Council has reached a position on AML Regulation and AMLD 6 in December 2022, the Parliament still needs to determine its position before the institutions can enter official discussions with each other. It is expected that the final texts of the acts will not be available before the end of the first half of 2023.

Climate change, environmental and social issues

In 2022, the EU Taxonomy, a classification system, establishing a list of environmentally sustainable economic activities, was developed further. On April 6, 2022, the European Commission published a delegated regulation (“SFDR RTS”) that specifies the content, methodologies and presentation of disclosures pursuant to the Sustainable Finance Disclosure Regulation (“SFDR”) and the Taxonomy Regulation. The SFDR RTS apply since January 1, 2023 to financial market participants.

On January 1, 2022, the first two Delegated Acts on Climate and on Disclosure supplementing Article 8 of the Taxonomy Regulation became effective. The Article 8 Disclosures Delegated Act specifies the content, methodology and presentation of disclosure required in accordance with Article 8 of the Taxonomy Regulation and requires financial institutions to disclose the share of environmentally sustainable economic activities in the total assets they finance or invest in. As a result, in 2022 banks for the first time disclosed their share of economic activities which are eligible under the EU Taxonomy criteria. As the disclosure rules apply on a phased-in basis, more detailed reporting requirements will apply from January 1, 2024 (Green Asset Ratio). The Article 8 Disclosures Delegated Act interrelates with the EU Taxonomy Climate Delegated Act which provides technical screening criteria to classify assets or activities as “sustainable” and support the climate change mitigation and adaptation objectives.

Additionally, in March 2022 the Complementary Climate Delegated Act on nuclear and gas was adopted by the European Commission. The act amends the EU Taxonomy Climate Delegated Act and introduces conditions subject to which certain nuclear and gas activities can qualify as activities that contribute substantially to climate change mitigation (i.e., as a transitional activity) within the meaning of the EU Taxonomy. In addition, the Taxonomy Complementary Climate Delegated Act will amend the Article 8 Disclosures Delegated Act by introducing specific disclosure requirements associated with natural gas and nuclear energy activities. The EU Taxonomy remains under further development.

In 2021, the European Commission published its renewed sustainable finance strategy and also a draft for a regulation on a European Green Bond Standard (“EuGBS”). The proposed EuGBS will create a high-quality voluntary standard for bonds financing EU taxonomy-aligned sustainable investments. The EuGBS is currently being further negotiated and expected to enter into force in 2023.

Another important development was the publication of the proposal for a Corporate Sustainability Due Diligence Directive (“CSDDD”) on February 23, 2022, by the European Commission. The CSDDD among other aspects establishes due diligence obligations for corporates to identify, end, avoid, mitigate and account for human rights and environmental risks in companies’ value chains. Financial institutions are expected to carry out the due diligence obligations with regard to both their supply chain and their client relationships. The CSDDD is currently under negotiations in Brussels. While the Member States (Council) reached an agreement in December, the European Parliament is still in the process of building its view. After the vote in the European Parliament, final negotiations between both co-legislators, the Council and the EU Parliament, can start. The Directive is expected to be finalized by year-end 2023.

In Germany, the Act on Corporate Due Diligence in Supply Chains (*Lieferkettensorgfaltspflichtengesetz*) entered into force on January 1, 2023. Under the act, credit institutions that grant loans, engage in collateral transactions or invest customer funds will generally be subject to due diligence requirements only with respect to the borrower, the collateral taker or the investment. However, a credit institution granting large loans or engaging in other transactions that typically result in significant control and information rights of the institution may be subject to enhanced due diligence requirements also with respect to end customers, or, more generally, the use of the funds. This may require banks to take additional aspects into account when assessing credit risk and entering into financial transactions.

In 2022, the EU Corporate Sustainability Reporting Directive (“CSRD”) was also finalized and entered into force on January 5, 2023. The directive will replace the existing reporting requirements under the Non-Financial Reporting Directive (“NFRD”). The CSRD extends the scope of companies which have to report sustainability information, introduces more detailed reporting requirements following mandatory sustainability reporting standards and requires the reported information to be assured. The companies that are already subject to NFRD will have to apply the new rules for the first time in financial year 2024, for reports published in 2025.

In 2022, U.S. regulators continued to focus on climate-related initiatives and policies within their existing remits. Notable developments include, in March 2022, the Securities and Exchange Commission released their anticipated proposal on climate disclosures for public companies which would require certain climate related information (including scope 1, 2 and 3 emissions) to be included within a company’s annual filings. The Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation, and the Federal Reserve Board all released draft principles for climate related financial risk management. The New York State Department of Financial Services also released proposed guidance for New York state-regulated banks to manage climate related risks. The Federal Reserve Board announced the launch of a “pilot micro-prudential scenario analysis exercise” in 2023 to better assess the long-term, climate-related financial risks facing the six largest U.S. institutions.

Regulation and Supervision

Deutsche Bank's operations throughout the world are regulated and supervised by the relevant authorities in each of the jurisdictions where the bank conducts business. Such regulation relates to licensing, capital adequacy, liquidity, risk concentration, conduct of business as well as organizational and reporting requirements. It affects the type and scope of the business the bank conducts in a country and how it structures specific operations.

Highlights

On October 27, 2021, the European Commission published a comprehensive package of reforms with respect to European Union banking rules (the "Banking Package 2021") to ensure that banks become more resilient to potential future economic shocks while contributing to the European Union's recovery from the COVID-19 pandemic and its transition to climate neutrality. The proposals aim to amend the Capital Requirements Regulation ("CRR"), the Capital Requirements Directive ("CRD") and the Bank Recovery and Resolution Directive ("BRRD"). If adopted, the proposals to amend the CRR and CRD (commonly referred to as "CRR III" and "CRD VI") will, in particular, finalize the implementation of the Basel 3 framework in the European Union and also fully implement the market risk capital changes in the Fundamental Review of the Trading Book ("FRTB"). Another separate proposal entails combined amendments to the CRR and the BRRD with respect to the resolution regime.

CRR III and CRD VI include, among other things, a gradually introduced output floor establishing minimum risk-weighted assets that will ultimately be set at 72.5 % of the risk-weighted assets calculated under the standardized approach, changes to standardized and internal ratings-based approaches for determining credit risk, changes to the credit valuation adjustment, a revision of the approaches for operational risks and reforms to the market risk framework as set out in the FRTB, adjustments to the Pillar 2 requirements and the systemic risk buffer ("SyRB") and a "fit-and-proper" set of rules for the senior staff managing banks. Other proposed measures are aimed at addressing sustainability risks by requiring banks to identify, disclose and manage environmental, social and governance risks as part of their risk management framework and include regular climate stress testing by the banks' supervisors. The proposal does not entail any adjustments to the capital requirements for green or brown assets. However, the European Commission has already stated that it is exploring this idea and has asked the European Banking Authority ("EBA") to assess possible adjustments. It is expected that the EBA will provide its final report by mid-2023. Depending on the outcome of the negotiation, CRR III and CRD VI may include provisions on the capital treatment of crypto assets, as described below. It remains to be seen to what extent that will follow the already-published standards by the Basel Committee on Banking Supervision.

The proposals regarding the resolution regime include clarifications with respect to some aspects of the total loss absorbing capacity ("TLAC") / minimum requirement for own funds and eligible liabilities ("MREL") regime in relation to single point of entry and multiple point of entry resolution strategies and, in particular, a deduction regime requiring intermediate parents to deduct from their own internal MREL capacity the amount of their holdings of internal MREL eligible instruments, including own funds, issued by their subsidiaries belonging to the same resolution group.

The Banking Package 2021 will continue to be negotiated with EU lawmakers, i.e. the European Parliament and the Council. The Council reached its position on the implementation of the Banking Package 2021 in November 2022, and the European Parliament reached its position in February 2023. The proposal of the European Parliament entails, in particular, an amendment that would require banks to apply a risk-weighting of 1,250% of capital to crypto asset exposures. It is expected that CRR III and CRD VI will start entering into force at the end of 2023 at the earliest with the new rules implementing Basel 3 to apply from January 1, 2025. According to an assessment conducted by the EBA, the full implementation of the Basel 3 framework in the European Union could lead to an increase in the minimum capital requirements of all European banks of 10.7 % and 20 % for global systemically important institutions ("G-SIIs").

The implementation of the remaining outstanding proposals under Basel 3 as contained in the Banking Package 2021 has the potential to increase Deutsche Bank's risk-weighted assets and will likely affect its business by raising its regulatory capital and liquidity requirements and by leading to increased costs.

Deutsche Bank AG is authorised and regulated by the European Central Bank (ECB) and the German Federal Financial Supervisory Authority (BaFin). Following the departure of the United Kingdom (UK) from the European Union as a result of Brexit, and European Union law ceasing to be applicable in the UK as from end of 2020, Deutsche Bank AG applied for a new UK authorization (Part 4A) from the Prudential Regulatory Authority (PRA), which it received on December 19, 2022. With respect to its regulated activities in the UK, and the continued operation of its London Branch, Deutsche Bank AG is authorised by the PRA and subject to regulation by the Financial Conduct Authority (FCA) and limited regulation by the PRA.

Pursuant to that authorisation Deutsche Bank AG continues to provide banking and other financial services in the UK both from its London Branch and also on a cross-border basis. Divergence between UK and European Union law will potentially, and increasingly, pose challenges for both Deutsche Bank AG and the financial services industry generally.

The following sections present a description of the regulation and supervision of Deutsche Bank's business in its home market Germany under the European Union framework of regulation and in the United States.

Regulation in Germany under the Regulatory Framework of the European Union

Deutsche Bank is subject to comprehensive regulation under German law and regulations promulgated by the European Union which are directly applicable law in Germany.

The German Banking Act (*Kreditwesengesetz*) and the CRR are important sources of regulation for German banks with respect to prudential regulation, licensing requirements, and the business activities of financial institutions. In particular, the German Banking Act requires that an enterprise which engages in one or more of the activities categorized in the German Banking Act as "banking business" or "financial services" in Germany must be licensed as a credit institution (*Kreditinstitut*) or financial services institution (*Finanzdienstleistungsinstitut*), as the case may be. Deutsche Bank AG is licensed as a credit institution and is authorized to conduct banking business and to provide financial services.

Significant parts of the regulatory framework for banks in the European Union are governed by the CRR. The CRR includes requirements relating to regulatory capital, risk-based capital adequacy, monitoring and control of large exposures, consolidated supervision, leverage, liquidity and public disclosure, including Basel 3 standards.

Certain other requirements that apply to Deutsche Bank, including those with respect to capital buffers, organizational and risk management requirements, are set forth in the German Banking Act and other German laws, partly implementing European Union directives such as the CRD.

Deutsche Bank AG, headquartered in Frankfurt am Main, Germany, is the parent institution of Deutsche Bank Group. Under the CRR, Deutsche Bank AG, as credit institution and parent company, is responsible for regulatory consolidation of all subsidiary credit institutions, financial institutions, asset management companies and ancillary service undertakings. Generally, the bank regulatory requirements under the CRR and the German Banking Act apply both on a stand-alone and a consolidated basis. However, banks forming part of a consolidated group may receive a waiver with respect to the application of specific regulatory requirements on an unconsolidated basis if certain conditions are met. As of December 31, 2020, Deutsche Bank AG benefited from such a waiver, according to which Deutsche Bank AG needs to apply the requirements relating to own funds, large exposures, exposures to transferred credit risks, leverage and disclosure by institutions, as well as certain risk management requirements, only on a consolidated basis.

Capital Adequacy Requirements

Minimum Capital Adequacy Requirements (Pillar 1)

The minimum capital adequacy requirements for banks are primarily set forth in the CRR. The CRR requires German banks to maintain an adequate level of regulatory capital in relation to the total of their risk positions, referred to as total exposure amount. Risk positions include credit risk positions, market risk positions and operational risk positions (including, among other things, risks related to certain external factors, as well as to technical errors and errors of employees). The most important type of capital for compliance with the capital requirements under the CRR is Common Equity Tier 1 capital. Common Equity Tier 1 capital primarily consists of share capital, retained earnings and other reserves, subject to certain regulatory adjustments. Another component of regulatory capital is Additional Tier 1 capital, which includes, for example, certain unsecured subordinated perpetual capital instruments and related share premium accounts. An important feature of Additional Tier 1 capital is that the principal amount of the instruments will be written down, or converted into Common Equity Tier 1 capital, when the Common Equity Tier 1 capital ratio of the financial institution falls below a minimum of 5.125% (or such higher level as the issuing bank may determine). Common Equity Tier 1 capital and Additional Tier 1 capital together constitute Tier 1 capital. An additional type of regulatory capital is Tier 2 capital which generally consists of long-term subordinated debt instruments. Tier 1 capital and Tier 2 capital together constitute own funds.

Under the CRR, banks are required to maintain a minimum ratio of Tier 1 capital to total risk exposure amount of 6% and a minimum ratio of Common Equity Tier 1 capital to total risk exposure of 4.5%. The minimum total capital ratio of own funds to total risk exposure is 8%.

Capital Buffers

The German Banking Act also requires banks to build up a mandatory capital conservation buffer (Common Equity Tier 1 capital amounting to 2.5% of total risk exposure), and authorizes the BaFin to set a domestic countercyclical capital buffer ("CCyB") for Germany (Common Equity Tier 1 capital of generally 0% to 2.5% of total risk exposure, or more in particular circumstances) during periods of high credit growth. Due to the impact of the COVID-19 pandemic, BaFin had temporarily lowered the CCyB to 0%. Effective as of February 1, 2022, BaFin set the CCyB at 0.75% and banks have to comply with this CCyB requirement since February 1, 2023. In order to comply with the CCyB requirement, banks must calculate their institution-specific CCyB as the weighted average of the CCyBs that apply to them in the jurisdictions where their relevant credit exposures are located. Accordingly, the total CCyB requirement, if any, with which Deutsche Bank needs to comply also depends on the corresponding buffer requirements in other jurisdictions. In addition, BaFin may require banks to build up a SyRB (Common Equity Tier 1 capital of a minimum of 0.5% of the total risk exposure amount for all exposures to prevent and mitigate long term non-cyclical systemic or macro-prudential risks not otherwise covered by CRR/CRD). Any SyRB determined by BaFin in excess of 5% would require prior authorization of the European Commission. Deutsche Bank's current SyRB is 0%. Effective as of April 1, 2022, BaFin set a SyRB of 2% with regard to residential real estate financing that applies since February 1, 2023. G-SIIs are subject to an additional capital buffer (Common Equity Tier 1 capital of between 1% and 3.5% of risk-weighted assets), which the BaFin determines for German banks based on a scoring system measuring the bank's global systemic importance. Deutsche Bank's current G-SII capital risk buffer is 1.5%. BaFin can also determine a capital buffer of Common Equity Tier 1 capital of up to 3% of risk-weighted assets for other systemically important banks (so-called O-SIIs) in Germany, based on criteria measuring, among others, the bank's importance for the economy in Germany and the European Economic Area (EEA). Deutsche Bank is subject to treatment both as a G-SII, as well as an O-SII (on a consolidated basis). Any risk buffer for O-SIIs that exceeds the threshold of 3% requires prior authorization by the European Commission. Deutsche Bank's current O-SII capital buffer is 2%. The buffers for G-SIIs and the buffer for O-SIIs are not cumulative; only the higher of these buffers applies. However, such higher buffer and the SyRB are cumulative. If the total buffer is higher than 5%, BaFin needs to seek approval by the European Commission. If a bank fails to build up the required capital buffers, it will be subject to restrictions on the pay-out of dividends, share buybacks and discretionary compensation payments. Also, within the single supervisory mechanism ("SSM"), the ECB may require banks to maintain higher capital buffers than those required by the BaFin.

Leverage Ratio

The CRR also provides for a Tier 1 capital-based binding minimum leverage ratio requirement of 3%. The minimum leverage ratio requirement is calculated on a non-risk basis and complements the other risk-based capital requirements. Competent authorities have discretion to allow banks to exclude certain central bank exposures from the calculation of the leverage ratio. The ECB and the BaFin declared the existence of exceptional circumstances in September 2020 and subsequently extended the allowed exclusion until March 31, 2022. On February 10, 2022, the ECB confirmed that it sees no need to extend this measure further.

In addition to the minimum leverage ratio requirement, the CRR provides for a leverage ratio buffer requirement for G-SIIs (such as Deutsche Bank), which must be met with Tier 1 capital and is set at 50% of the G-SII's risk-weighted capital buffer rate. Such requirement applies since January 1, 2023. Certain aspects relating to the leverage ratio buffer requirement as contained in the CRD (such as restrictions on the pay out of dividends etc. if the requirements are not met) must be implemented in the laws of the individual member jurisdictions.

Pillar 2 Capital Requirements and Guidance

Furthermore, the ECB may impose capital requirements on individual significant credit institutions which are more stringent than the statutory minimum requirements set forth in the CRR, the German Banking Act or the related regulations. Upon completion of the supervisory review and evaluation process ("SREP") discussed in greater detail below, the competent supervisory authority makes an SREP decision in relation to each relevant bank, which may include specific capital and liquidity requirements for each affected bank. Any such additional bank-specific capital requirements resulting from the SREP are referred to as Pillar 2 requirements in addition to the statutory minimum capital and buffer requirements. Institutions must meet their Pillar 2 requirements with at least 75% of Tier 1 capital and at least 56.25% of Common Equity Tier 1 capital.

In addition, the ECB may decide following the SREP to communicate to individual banks an expectation to hold a further Pillar 2 Common Equity Tier 1 capital add-on, the so-called Pillar 2 guidance. The ECB has stated that it generally expects banks to meet the Pillar 2 guidance although it is not legally binding and failure to meet the Pillar 2 guidance does not automatically have legal consequences. The competent supervisory authority may take a range of other measures based on the SREP outcome to address shortcomings in a bank's governance and risk management processes or its capital or liquidity position, such as prohibiting dividend payments to shareholders or distributions to holders of regulatory capital instruments. During the COVID-19 pandemic, the ECB temporarily allowed banks to operate below the level of capital defined by the Pillar 2 guidance. Since January 1, 2023, banks are again expected to operate above the Pillar 2 guidance.

For details of Deutsche Bank's regulatory capital, see "Management Report: Risk Report: Risk and Capital Performance" in Deutsche Bank's Annual Report 2022.

MREL Requirements

As discussed below under "Recovery and Resolution", to ensure that European banks have a sufficient amount of liabilities with loss-absorbing capacity, they are required to meet MREL determined for each institution individually on a case-by-case basis. The European Union implemented the Financial Stability Board's ("FSB") TLAC standard for global systemically important banks ("G-SIBs", such as Deutsche Bank) by introducing a Pillar 1 MREL requirement for G-SIBs (the European equivalent term for G-SIBs). This requirement is based on both risk-based and non-risk-based denominators and will be set at the higher of 18% of total risk exposure and 6.75% of the leverage ratio exposure measure. It can be met with Tier 1 or Tier 2 capital or debt that meets specific eligibility criteria. Deduction rules apply for holdings by G-SIBs of TLAC instruments of other G-SIBs. In addition, the competent authorities have the ability to impose on G-SIBs individual MREL requirements that exceed the statutory minimum requirements. See "Highlights" above for further information on clarifications with respect to the TLAC / MREL regime that are included in the Banking Package 2021.

Limitations on Large Exposures

The CRR also contains the primary restrictions on large exposures, which limit a bank's concentration of credit risks. The German Banking Act and the Large Exposure Regulation (*Großkredit- und Millionenkreditverordnung*) supplement the CRR in this regard. Under the CRR, Deutsche Bank's exposure to a customer and any customers affiliated with such customer is deemed to be a "large exposure" when the value of such exposure is equal to or exceeds 10% of its Tier 1 capital. All exposures to a single customer and any customers affiliated with such customer are aggregated for these purposes. In general, no large exposure may exceed 25% of Deutsche Bank's Tier 1 capital, or, in case the customer is a bank designated as G-SIB, 15% of its Tier 1 capital. Competent authorities may set a lower limit than € 150 million. For exposures in the trading book, the large exposure regime may give greater latitude, subject to an additional own funds requirement.

Liquidity Requirements

The CRR introduced a liquidity coverage requirement intended to ensure that banks have an adequate stock of unencumbered high quality liquid assets that can be easily and quickly converted into cash to meet their liquidity needs for a 30-calendar day liquidity stress scenario. The required liquidity coverage ratio ("LCR") is calculated as the ratio of a bank's liquidity buffer to its net liquidity outflows. Also, banks must regularly report the composition of the liquid assets in their liquidity buffer to their competent authorities.

In addition, the CRR provides for a net stable funding ratio ("NSFR") to reduce medium- to long-term funding risks by requiring banks to fund their activities with sufficiently stable sources of funding over a one-year period. The NSFR is defined as the ratio of a bank's available stable funding relative to the amount of required stable funding over a one-year period. Banks must maintain an NSFR of at least 100%. The NSFR applies to both the Group as a whole and to individual SSM regulated entities, including the parent entity Deutsche Bank AG.

The ECB may impose on individual banks liquidity requirements which are more stringent than the general statutory requirements if the bank's continuous liquidity would otherwise not be ensured.

Separation of Proprietary Trading Activities by Universal Banks

The German Separation Act provides that deposit-taking banks and their affiliates are prohibited from engaging in proprietary trading that does not constitute a service for others, high-frequency trading, and credit or guarantee transactions with hedge funds and comparable enterprises that are substantially leveraged, unless such activities are exempt or excluded, or in the case where no such exemption or exclusion is available, is transferred to a separate legal entity, referred to as a financial trading institution (*Finanzhandelsinstitut*). The separation requirement applies if certain thresholds are exceeded, which is the case for Deutsche Bank. In addition, the German Separation Act authorizes the BaFin to prohibit the deposit-taking bank and its affiliates, on a case-by-case basis, from engaging in market-making and other activities that are comparable to the activities prohibited by law, if these activities may put the solvency of the deposit-taking bank or any of its affiliates at risk. In the event that the BaFin orders such a prohibition, the respective activities must be discontinued or transferred to a separate financial trading institution. The financial trading institution may be established in the form of an investment firm or a bank and may be part of the same group as the deposit-taking bank. However, it must be economically and organizationally independent from the deposit-taking bank and its other affiliates, and it has to comply with enhanced risk management requirements. Deutsche Bank has established a compliance and control framework to ensure that no prohibited activities are conducted. Deutsche Bank has not established a financial trading institution.

Anti-Financial Crime, Sanctions, Fraud, Bribery and Corruption

Financial sector participants are required to take steps to prevent the abuse of the financial system through money laundering and other financial crime. The European Union has continually sought to strengthen its framework for anti-money laundering and combating the financing of terrorism, in line with international standards set by the Financial Action Task Force. On July 20, 2021, the European Commission presented a new package of legislative proposals to strengthen the existing rules (the “AML/CFT Package”). If adopted, the proposals in the new AML/CFT Package will establish an overhauled integrated European AML supervisory system with the single rulebook expanding the list of obliged entities and including harmonized, more detailed and granular rules on, among other things, customer due diligence, beneficial ownership, and AML/CFT risk management. Generally, the requirements (such as know-your-customer requirements) currently set out in the German AML Act (*Geldwäschegesetz*) and the German Banking Act apply to all business lines and infrastructure units as well as all subsidiaries and affiliates that undertake AML-relevant business and in which Deutsche Bank AG has a dominating influence.

Deutsche Bank is required to comply with international sanctions, which are measures to protect national security interests or international law by countries, multilateral or regional organizations against certain countries, organizations or individuals restricting economic activity. In 2022, various sanctions laws and regulations were issued or changed requiring Deutsche Bank to update policies and processes such as name list screening and transaction filtering; this is especially true for the high number of sanctions imposed by the EU, the United States and UK against Russia because of its war against Ukraine since February 24, 2022.

Deutsche Bank is subject to fraud, bribery and corruption laws and regulations under the German Criminal Code and in the other countries in which it conducts business. The UK Bribery Act 2010 has extraterritorial impact and requires Deutsche Bank to design and develop appropriate measures to mitigate bribery and corruption risk and to administer controls and safeguards to mitigate such risks.

Data Protection and Cyber Risk

Deutsche Bank has to comply with all applicable data protection laws in the countries in which it operates. The regulation on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, also referred to as the General Data Protection Regulation (“GDPR”), became applicable in the European Union on May 25, 2018. It relates to data protection and privacy rights of individuals within the European Union and addresses the export of personal data to other jurisdictions. The GDPR primarily aims at giving individuals control over their personal data and to unifying the regulatory environment for cross-border business. Superseding the 1995 Data Protection Directive, the GDPR contains provisions and requirements pertaining to the processing of personal data of individuals and also applies to businesses inside the European Union that are processing personal data. The regulation furthermore applies to businesses outside of the European Union if goods or services are offered to data subjects in the European Union, or if the behavior of data subjects in the European Union is being monitored. The GDPR imposes compliance obligations and grants broad enforcement powers to supervisory authorities, including the potential to levy significant fines for non-compliance.

Under the German Banking Act and the BaFin’s Minimum Requirements for Risk Management for Banks (*Mindestanforderungen an das Risikomanagement*) together with the BaFin’s Supervisory Requirements for IT in Financial Institutions (*Bankaufsichtlichen Anforderungen an die IT*), information security needs to be an integral part of a financial institution’s IT strategy and risk management. The BaFin requires that financial institutions establish a comprehensive information and cyber security program, define standards, implement controls and adhere to their resulting security policies and standards in accordance with evolving business requirements, regulatory guidance, and an emerging threat landscape. Information security risk management is part of vendor risk management for any procurement of information technology or outsourcing activity include the use of new technologies like cloud services. Information security risk (also referred to as cyber risk) is a component of operational risk assessed in the context of the SREP under Guidelines on Information and Communication Technology Risk Assessment issued by the EBA, which expects financial institutions to protect the confidentiality, integrity, and availability of customer data and information assets. Such guidelines are complemented by the EBA’s Guidelines on ICT and Security Risk Management. Further, at the European Union level, the recently adopted Digital Operational Resilience Act, which will apply from January 17, 2025, and the complementing amending directive introduce a comprehensive framework setting out rules on the digital operational resilience for all regulated financial institutions throughout the European Union.

Remuneration Rules

Under the German Banking Act and the German Credit Institution Remuneration Regulation (*Institutsvergütungsverordnung*), Deutsche Bank AG is subject to certain restrictions on the remuneration it pays to its management board members and employees. These remuneration rules implement requirements of the CRD and impose a cap on bonuses. Pursuant to this cap, the variable remuneration for management board members and employees must not exceed the fixed remuneration. The variable remuneration may be increased to twice the management board member's or employee's fixed remuneration if expressly approved by the shareholders' meeting with the required majority. In addition, Deutsche Bank AG is obliged to identify individuals who have a material impact on the bank's risk profile ("material risk takers"). Such material risk takers are subject to additional rules, such as the requirement that at least 40% or, as the case may be, at least 60% of the variable remuneration granted to them must be on a deferred basis. The minimum deferral period is four years and may increase to five years depending on certain factors. For certain material risk takers the minimum deferral period is set to five years. Also at least 50% of the variable remuneration for material risk takers must be paid in shares of the bank or instruments linked to shares of the bank. Variable compensation of material risk takers has to be subject to an ex-post risk adjustment mechanism and to a claw back provision in case of personal wrongdoing. These deferral and claw back provisions do not apply to a material risk taker whose variable remuneration does not exceed € 50,000 gross and 1/3 of the total annual remuneration. Finally, Deutsche Bank is required to comply with certain disclosure requirements relating to the remuneration it pays to, and its remuneration principles in respect of, its material risk takers and other affected employees.

For details of Deutsche Bank's remuneration system, see "3 - Compensation Report" in Deutsche Bank's Annual Report 2022.

Deposit Protection and Investor Compensation in Germany

The Deposit Protection Act and the Investor Compensation Act

The German Deposit Protection Act (*Einlagensicherungsgesetz*) and the German Investor Compensation Act (*Anlegerentschädigungsgesetz*) provide for a mandatory deposit protection and investor compensation system in Germany, based on a European Union directive on deposit guarantee schemes ("DGS Directive") and a European Union directive on investor compensation schemes.

The German Deposit Protection Act requires that each German bank participates in one of the statutory government-controlled deposit protection schemes (*Entschädigungseinrichtungen*). Since October 2021, the *Entschädigungseinrichtung deutscher Banken GmbH* ("EdB") is the sole German deposit protection scheme for all German banks. The EDB collects and administers the contributions of the member banks, and settles any compensation claims of depositors in accordance with the German Deposit Protection Act.

Under the German Deposit Protection Act, deposit protection schemes are generally liable for obligations resulting from deposits denominated in any currency in an amount of up to € 100,000 per depositor and bank. Certain depositors, such as banks, insurance companies, investment funds and governmental bodies, are excluded from coverage.

Deposit protection schemes are financed by annual contributions of the participating banks proportionate to their potential liabilities, depending on the amount of its covered deposits and the degree of risk the bank is exposed to. A target level of 0.8% of the total covered deposits of the participating banks is supposed to be reached by July 3, 2024. Deposit protection schemes may also levy special contributions if required to settle compensation claims.

Deposit protection schemes will be required to contribute to bank resolution costs where resolution tools are used. The contribution made by the deposit protection scheme is limited to the compensation it would have to pay if the affected bank had become subject to insolvency proceedings. Furthermore, deposit protection schemes may provide funding to its participating banks to avoid their failure under certain circumstances.

Under the German Investor Compensation Act, in the event that the BaFin ascertains a compensation case, EDB as Deutsche Bank AG's deposit protection scheme is also required to compensate 90% of the aggregate claims of each covered creditor arising from securities transactions denominated in euro or in a currency of any other European Union Member State up to an amount of the equivalent of € 20,000. Many financial sector participants such as banks, insurance companies, investment funds, governmental bodies or medium-sized and large corporations, however, do not benefit from this coverage.

Voluntary Deposit Protection System

Liabilities to creditors that are not covered by a statutory compensation scheme may be covered by the Deposit Protection Fund (*Einlagensicherungsfonds*) set up by the Association of German Banks (*Bundesverband deutscher Banken e.V.*) of which Deutsche Bank AG is a member. The Deposit Protection Fund protects deposits, i.e., generally credit balances credited to an account or resulting from interim positions which the bank is required to repay, subject to certain exclusions, up to an amount equal to 15% of the bank's own funds (*Eigenmittel*) as further specified in the Deposit Protection Fund's by-laws. This limit will be reduced to 8.75% from January 1, 2025 onwards.

The financial resources of the Deposit Protection Fund are funded by contributions of the participating banks. If the resources of the Fund are insufficient, banks may be required to make special contributions, in particular if the resources of the Deposit Protection Fund become stretched due to bank insolvencies or otherwise.

The Association of German Banks launched on December 8, 2021 a far-reaching reform project for its Deposit Protection Fund. The project was finalized in April 2022 and has started phasing in from 2023 onwards. Key elements are the exclusion of deposits of insurance and re-insurance undertakings, UCITS and pension funds as well as governmental agencies. Furthermore, as of January 1, 2023, deposits held with non-German branches of Deutsche Bank AG are no longer covered unless grandfathering rules apply. Also, absolute cover limit amounts will apply to all depositors. These amounts are € 5 million per depositor from January 1, 2023 onwards which will be reduced to € 3 million on January 1, 2025 and € 1 million on January 1, 2030. For corporates the limits will be ten times higher but limited to deposits with a maturity of up to twelve months.

Market Conduct, Investor Protection and Infrastructure Regulation

Under the German Securities Trading Act (*Wertpapierhandelsgesetz*), the BaFin regulates and supervises securities trading, including the provision of investment services, in Germany. The German Securities Trading Act contains, among other things, disclosure and transparency rules for issuers of securities that are listed on a German exchange and organizational requirements as well as rules of conduct which apply to all businesses that provide investment services. Investment services include, in particular, the purchase and sale of securities or derivatives for others and the intermediation of transactions in securities or derivatives as well as investment advice. The BaFin has broad powers to investigate businesses providing investment services to monitor their compliance with the organizational requirements, rules of conduct and reporting requirements. In addition, the German Securities Trading Act requires an independent auditor to perform an annual audit of the investment services provider's compliance with its obligations under the German Securities Trading Act.

A related area is the Market Abuse Regulation ("MAR") which establishes a common European Union framework for, inter alia, insider dealing, the public disclosure of inside information, market manipulation, and managers' transactions. The German Securities Trading Act, which had contained rules on market abuse prior to the entering into force of the MAR, continues to supplement the MAR in this respect, for example by providing for sanctions in case of violations of the MAR.

In addition, the Markets in Financial Instruments Directive ("MiFID"), implemented primarily by the German Securities Trading Act, and the Markets in Financial Instruments Regulation ("MiFIR") provide for a greater regulation and oversight of financial firms providing investment services or activities in the European Union by covering additional markets and instruments, the extension of pre- and post-trade transparency rules from equities to all financial instruments, greater restrictions on operating trading platforms, and greater sanctioning powers. The trading venues under supervision include organized trading facilities. In addition, MiFID/MiFIR, also provide for a trading obligation for OTC derivatives subject to mandatory clearing and which are sufficiently standardized, and investor protection rules that significantly impact the way investment firms distribute products. On November 25, 2021, the European Commission published a proposal for a review of the MiFIR (referred to as the "MiFIR Review") that entails amendments to the MiFIR and the MiFID. The proposals in the MiFIR Review, among other things, introduce an EU-wide consolidated tape for each asset class, enhanced transparency requirements for small trades in equities (such as shares) and for non-equities (such as derivatives and bonds), and adjust the scope of the EU share trading obligation and derivatives trading obligation.

The Regulation on Key Information Documents or Packaged Retail and Insurance-based Investment Products (PRIIPs) applies since January 1, 2018. It focuses on disclosure and transparency requirements when advising on or selling retail structured products and other complex and packaged investment products and aims at increasing investor protection.

Beyond the infrastructure-related provisions of MiFID and MiFIR, market infrastructure has been the focus of other regulatory initiatives of the European Union that are relevant for Deutsche Bank. The Regulation on Transparency of Securities Financing Transaction aims at increasing transparency and reducing risks associated with such transactions. The regulation requires that repos, securities lending transactions and transactions with equivalent effect and margin lending transactions be reported to trade repositories and requires risk disclosures and consent before assets are reused or re-hypothecated. For the OTC derivatives markets, the European Regulation on OTC Derivatives, Central Counterparties ("CCPs") and Trade Repositories, also referred to as European Market Infrastructure Regulation ("EMIR"), pursues the goals of reducing system, counterparty and operational risk and increase transparency in the OTC derivatives markets. The regulation introduced requirements for standardized over-the-counter derivatives, such as central clearing, margining, portfolio reconciliation or reporting to trade repositories. On November 7, 2022, the European Commission published a legislative package with respect to clearing services (the "Clearing Package") that entails a proposal for a review of the EMIR that is accompanied by targeted amendments to other European laws like the CRR and the CRD. The Clearing Package aims to make EU CCPs more competitive, to channel clearing in EUR denominated instruments to EU CCPs and to enhance the existing supervisory framework.

In addition, the European Union's Regulation on Financial Benchmarks seeks to ensure the integrity and accuracy of indices used as benchmarks for financial instruments and contracts, and prevent their manipulation. European Union-regulated banks, investment firms, fund managers and certain other supervised entities are only permitted to use benchmarks provided in accordance with the regulation. Benchmark administrators in the European Union are required to obtain authorization or registration, and are subject to rules and oversight regarding their organization, governance and conduct. Benchmarks provided by non-EU administrators are permissible under certain conditions.

Legal Requirements relating to Financial Statements and Audits

As required by the German Commercial Code (*Handelsgesetzbuch*), Deutsche Bank AG prepares its non-consolidated financial statements in accordance with German GAAP. Deutsche Bank Group's consolidated financial statements are prepared in accordance with International Financial Reporting Standards ("IFRS"), and the bank's compliance with capital adequacy requirements and large exposure limits is determined solely based upon such consolidated financial statements.

Under German law, Deutsche Bank AG is required to be audited annually by a certified public accountant (*Wirtschaftsprüfer*). Deutsche Bank AG's auditor is appointed each year at the annual shareholders' meeting. However, the supervisory board mandates the auditor and supervises the audit. The BaFin and the Deutsche Bundesbank ("Bundesbank"), the German central bank, must be informed of the appointment and the BaFin may reject the auditor's appointment. The German Banking Act requires that a bank's auditor inform the BaFin and the Bundesbank of any facts that come to the auditor's attention which would lead it to refuse to certify or to limit its certification of the bank's annual financial statements or which would adversely affect the bank's financial position. The auditor is also required to notify the BaFin and the Bundesbank in the event of a material breach by management of the articles of association or of any other applicable law. The auditor is required to prepare a detailed and comprehensive annual audit report (*Prüfungsbericht*) for submission to the bank's supervisory board, the BaFin and the Bundesbank. The BaFin and the Bundesbank share their information with the ECB. In addition to the statutory audit directive and its amendment that has been implemented into national law, Deutsche Bank is also subject to the European Union's Regulation on Specific Requirements regarding Statutory Audit of Public-Interest Entities which includes requirements for mandatory audit firm rotation and restrictions on non-audit services.

Banking Supervision under the Single Supervisory Mechanism

Under the European Union's system of financial supervision referred to as the single supervisory mechanism ("SSM"), the ECB is the primary supervisor of all systemically important or significant credit institutions (such as Deutsche Bank AG) and their banking affiliates in the relevant Member States. The competent national authorities supervise the remaining, less significant banks under the oversight of the ECB. As a result, Deutsche Bank AG is supervised by the ECB, the BaFin and the Bundesbank.

With respect to Deutsche Bank and other significant credit institutions, the ECB is the primary supervisor and is responsible for most tasks of prudential supervision, such as compliance with regulatory requirements concerning own funds, large exposure limits, leverage, liquidity, securitizations, corporate governance, business organization and risk management requirements. The ECB carries out its day-to-day supervisory functions through a joint supervisory team ("JST") established for Deutsche Bank Group. The JST is led by the ECB and comprises staff from the ECB and national supervisory authorities, including the BaFin and the Bundesbank. In addition, and regardless of whether an institution is significant or not, the ECB is responsible for issuing new licenses to credit institutions and for assessing the acquisition and increase of significant participations (also referred to as qualifying holdings) in credit institutions established in those Member States of the European Union that participate in the SSM and where notification of such changes must be filed.

The BaFin is Deutsche Bank's principal supervisor for regulatory matters with respect to which the bank is not supervised by the ECB. These include business conduct in the securities markets, in particular when providing investment services to clients, payment services and implementing measures against money laundering and terrorist financing, and they also include certain special areas of bank regulation, such as those related to the issuance of covered bonds (*Pfandbriefe*) and the supervision of German home loan banks (*Bausparkassen*) with regard to certain regulatory requirements specifically applicable to such home loan banks. Generally, the BaFin also supervises Deutsche Bank with respect to those requirements under the German Banking Act that are not based upon European law. The Bundesbank supports the BaFin and the ECB and closely cooperates with them. The cooperation includes the ongoing review and evaluation of reports submitted by Deutsche Bank and of its audit reports as well as assessments of the adequacy of the bank's capital base and risk management systems. The ECB, the BaFin and the Bundesbank receive comprehensive information from Deutsche Bank in order to monitor its compliance with applicable legal requirements and to obtain information on its financial condition.

Supervisory Review and Evaluation Process

For significant institutions such as Deutsche Bank, the JST conducts the SREP for an ongoing assessment of risks, governance arrangements and the capital and liquidity situation. The SREP requires that the JSTs review the arrangements, strategies, processes and mechanisms of supervised banks on a regular basis, in order to evaluate risks to which these banks are or might be exposed, risks they could pose to the financial system, and risks revealed by stress testing.

The SREP framework consists of a business model analysis, an assessment of internal governance and institution-wide control arrangements, an assessment of risks to capital and adequacy of capital to cover these risks; and an assessment of risks to liquidity and adequacy of liquidity resources to cover these risks. The SREP can result in Pillar 2 capital and liquidity requirements or guidance for the relevant institution (see above "Pillar 2 Capital Requirements and Guidance").

Audits, Investigations and Enforcement

Investigations and Supervisory Audits

The ECB and the BaFin may conduct audits of banks on a discretionary basis, as well as for cause. In particular, the ECB may audit Deutsche Bank's compliance with requirements with respect to which it supervises Deutsche Bank, such as those set forth in the CRR/CRD. The BaFin may also decide to audit the bank's compliance with requirements with respect to which it supervises the bank, such as those relating to business conduct in the securities markets and the regulation of anti-money laundering, to counter terrorist financing and payment services, as well as certain special areas of bank regulation, such as those related to the issuance of covered bonds and the supervision of German home loan banks.

The ECB as well as the BaFin may require a bank to furnish information and documents in order to ensure that the bank is complying with applicable bank supervisory laws. The ECB and the BaFin may conduct investigations without having to state a reason therefor. Such investigations may also take place at a foreign entity that is part of a bank's group for regulatory purposes. Investigations of foreign entities are limited to the extent that the law of the jurisdiction where the entity is located restricts such investigations.

The ECB and the BaFin may attend meetings of a bank's supervisory board and shareholders meetings. They also have the authority to require that such meetings be convened.

Supervisory and Enforcement Powers

The ECB has a wide range of enforcement powers in the event it discovers any irregularities concerning adherence to requirements with respect to which it supervises Deutsche Bank.

It may, for example,

- Impose additional own funds or liquidity requirements in excess of statutory minimum requirements;
- Restrict or limit a bank's business;
- Require the cessation of activities to reduce risk;
- Require a bank to use net profits to strengthen its own funds;
- Restrict or prohibit dividend payments to shareholders or distributions to holders of Additional Tier 1 instruments; or
- Remove the members of the bank's management or supervisory board members from office.

To the extent necessary to carry out the tasks granted to it, the ECB may also require national supervisory authorities to make use of their powers under national law. If these measures are inadequate, the ECB may revoke the bank's license. Furthermore, the ECB has the power to impose administrative penalties in case of breaches of directly applicable European Union laws, such as the CRR, or of applicable ECB regulations and decisions. Penalties imposed by the ECB may amount to up to twice the amount of profits gained or losses avoided because of the violation, or up to 10% of the total annual turnover of the relevant entity in the preceding business year or such other amounts as may be provided for in relevant European Union law. In addition, where necessary to carry out the tasks granted to it, the ECB may also require that the BaFin initiate proceedings to ensure that appropriate penalties are imposed on the affected bank.

The BaFin also retains a wide range of enforcement powers. As discussed above, it may take action if instructed by the ECB in connection with supervisory tasks granted to the ECB. With respect to supervisory tasks remaining with the BaFin, the BaFin may take action upon its own initiative. In particular, if a bank is in danger of defaulting on its obligations to creditors, the BaFin may take emergency measures to avert default. These emergency measures may include:

- Issuing instructions relating to the management of the bank;
- Prohibiting the acceptance of deposits and the extension of credit;
- Prohibiting or restricting the bank's managers from carrying on their functions;
- Prohibiting payments and disposals of assets;
- Closing the bank's customer services; and
- Prohibiting the bank from accepting any payments other than payments of debts owed to the bank.

The BaFin may also impose administrative pecuniary penalties under the German Banking Act and other German laws. Penalties under the German Banking Act may amount to generally up to € 5 million or, in certain cases, € 20 million, depending on the type of offense. If the economic benefit derived from the offense is higher, the BaFin may impose penalties of up to 10% of the net turnover of the preceding business year or twice the amount of the economic benefit derived from the violation.

Finally, violations of the German Banking Act may result in criminal penalties against the members of the Management Board or senior management.

Recovery and Resolution

Germany participates in the European Union's single resolution mechanism ("SRM"), which centralizes at a European level the key competences and resources for managing the failure of banks in Member States of the European Union participating in the banking union. The SRM is based on the SRM Regulation and the BRRD, which in Germany are mainly implemented through the German Recovery and Resolution Act (*Sanierungs- und Abwicklungsgesetz*).

Under the SRM, broad resolution powers with respect to banks domiciled in the participating Member States are granted to the Single Resolution Board ("SRB") as the central European resolution authority and to the competent national resolution authorities. Resolution powers in particular include the power to reduce, including to zero, the nominal value of shares, or to cancel shares outright, and to write down certain eligible subordinated and unsubordinated unsecured liabilities, including to zero, or convert them into equity (commonly referred to as "bail-in").

For a bank directly supervised by the ECB, such as Deutsche Bank, the SRB draws up the resolution plan, assesses the bank's resolvability and may require legal and operational changes to the bank's structure to ensure its resolvability. In the event that a bank is failing or likely to fail and certain other conditions are met, in particular where there is no reasonable prospect that any alternative private sector measures would prevent the failure and resolution measures are necessary in the public interest, the SRB is responsible for adopting a resolution scheme for resolving the bank pursuant to the SRM Regulation. The European Commission and, to a lesser extent, the Council of the European Union, have a role in endorsing or objecting to the resolution scheme proposed by the SRB. The resolution scheme would be addressed to and implemented by the competent national resolution authorities (the BaFin in Germany).

Resolution measures that could be imposed upon a failing bank may include a range of measures including the transfer of shares, assets or liabilities of the bank to another legal entity, the reduction, including to zero, of the nominal value of shares, the dilution of shareholders of a failing bank or the cancellation of shares outright, or the amendment, modification or variation of the terms of the bank's outstanding debt instruments, for example by way of deferral of payments or a reduction of the applicable interest rate. Furthermore, by way of a "bail-in", certain liabilities may be written down, including to zero, or converted into equity after the bank's regulatory capital has been exhausted.

To ensure that resolution measures can be effectively taken, contractual obligations governed by the laws of a non-EU country or that are subject to jurisdiction outside the European Union are required to include contractual provisions that ensure that the relevant obligation can be bailed in. In the case of financial contracts governed by the laws of a non-EU country or that are subject to jurisdiction outside the European Union, stay acceptance clauses need to be included.

To ensure sufficient availability of liabilities with loss-absorbing capacity that could be bailed in, the SRM Regulation and the German Recovery and Resolution Act introduced a requirement for banks to meet MREL. The required level of MREL is determined by the competent resolution authorities for each supervised bank individually on a case-by-case basis, depending on the preferred resolution strategy. In the case of Deutsche Bank AG, MREL is determined by the SRB.

In addition, G-SIIs are subject to a special Pillar 1 MREL requirement that implements the FSB's TLAC standard for G-SIBs (see "MREL Requirements" above).

G-SIIs will need to predominantly rely on capital instruments or eligible subordinated debt for this purpose. Effective January 1, 2017, the German Banking Act provided for a new class of statutorily subordinated debt securities that rank as senior non-preferred below the bank's other senior liabilities (but in priority to the bank's contractually subordinated liabilities, such as those qualifying as Tier 2 instruments). Following a harmonization effort by the European Union implemented in Germany effective July 21, 2018, banks are permitted to decide if a specific issuance of eligible senior debt will rank as senior non-preferred debt or as senior preferred debt.

The SRB is charged with administering the Single Resolution Fund, a pool of money which is financed by bank levies raised at national level and intended to reach a target level of 1% of insured deposits of all banks in Member States participating in the SRM by the end of 2023. It will be used for resolving failing banks after other options, such as the bail-in tool, have been exhausted. In line with the German Recovery and Resolution Act, public financial support for a failing bank should only be used as a last resort, after having assessed and exploited, to the maximum extent possible, resolution measures set forth in the SRM Regulation and the German Recovery and Resolution Act, including the bail-in tool.

Regulation in the EEA and Brexit

The European Union pursues common standards of laws and regulations to create consistency across the internal market and reduce compliance and regulatory burdens for businesses operating on a cross-border basis. The Agreement on the EEA extends this objective to Iceland, Liechtenstein and Norway. Members of the EEA have agreed to enact legislation similar to that passed in the European Union in many areas. Within the EEA, Deutsche Bank AG generally operates under the so-called "European Passport". Deutsche Bank AG is authorized and regulated by the ECB and BaFin. Deutsche Bank AG provides services throughout the EEA under the "European Passport" both through local branches established in many of the Member States, but also on a cross border basis from its headquarters in Frankfurt. To the extent that activities are carried out within a Member State's jurisdiction, the authorities of that host Member State supervise the conduct of such activities. This includes, for example, rules on treating clients fairly and rules governing a bank's conduct in the securities market.

The UK has ceased to be a Member State of the European Union and European law is no longer applicable within the UK. For the UK, this means that all extensions of European Union Member State 'privileges' are no longer available including any reliance upon the European Passport and automatic rights of access to EU market infrastructure.

Following Brexit, and European law ceasing to be applicable in the UK as from end of 2020, Deutsche Bank AG applied for new UK (Part 4A) authorisation from the PRA which it received on December 19, 2022. With respect to its regulated activities in the UK, and the continued operation of its London Branch, Deutsche Bank AG is authorised by the PRA and subject to regulation by the FCA and limited regulation by the PRA.

Deutsche Bank AG continues to provide banking and other financial services in the UK both from its London Branch and also on a cross-border basis. Divergence between UK and EEA law will potentially, and increasingly, pose challenges for both Deutsche Bank AG and the financial services industry generally.

Deutsche Bank Group subsidiaries have had to assess whether they conduct regulated activity in the UK (e.g., by providing UK regulated services to UK based clients), and where necessary, make plans to run off that activity within the UK's Financial Services Contracts Regime (FSCR) or otherwise ensure such activity can be conducted pursuant to a UK licensing exemption (i.e., the "overseas persons exclusion"). Deutsche Bank subsidiaries expected to conduct contractual run-off operations within the FSCR include BHM (FFT), Norisbank (FFT), DB Spa (Milan), DB SAE (Madrid), DB Polska (Warsaw), DB Luxembourg (Brussels) and all with respect to retail client activity only (largely as a result of clients having moved to the UK since first availing of the services).

Regulation and Supervision in the United States

Deutsche Bank's operations are subject to extensive federal and state banking, securities and derivatives regulation and supervision in the United States. Deutsche Bank engages in U.S. banking activities directly through its New York branch. It also controls U.S. bank subsidiaries, such as Deutsche Bank Trust Company Americas ("DBTCA"), and U.S. broker-dealers, such as Deutsche Bank Securities Inc., U.S. non-depository trust companies and other subsidiaries. Deutsche Bank holds its U.S. subsidiaries through two intermediate holding companies, DB USA Corporation, through which Deutsche Bank's U.S. banking subsidiaries and the large majority of its other U.S. subsidiaries are held, and DWS USA Corporation, through which Deutsche Bank's U.S. asset management subsidiaries are held.

In 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act") revised the U.S. regulatory framework for financial institutions in almost every area of U.S. financial regulation. The impact of the Dodd-Frank Act and its implementing regulations continues with further rulemaking, changes to existing regulations and tailoring.

The Dodd-Frank Act provisions known as the "Volcker Rule" limit the ability of banking entities and their affiliates to engage as principal in certain types of proprietary trading and to sponsor or invest in private equity or hedge funds or similar funds ("covered funds"), subject to certain exclusions and exemptions. In the case of non-U.S. banking entities such as Deutsche Bank AG, these exemptions permit certain activities conducted outside the United States, provided that certain criteria are satisfied. The Volcker Rule also limits the ability of banking entities and their affiliates to enter into certain transactions with covered funds with which they or their affiliates have certain relationships. The Volcker Rule also requires banking entities to establish comprehensive compliance programs designed to help ensure and monitor compliance with restrictions under the Volcker Rule.

The Dodd-Frank Act also provides regulators with tools to provide greater capital, leverage and liquidity requirements and other prudential standards, particularly for financial institutions that pose significant systemic risk. U.S. regulators are also able to restrict the size and growth of systemically significant non-bank financial companies and large interconnected bank holding companies. U.S. regulators are also required to impose bright-line debt-to-equity ratio limits on financial companies that the Financial Stability Oversight Council determines pose a grave threat to financial stability if it determines that the imposition of such limits is necessary to minimize the risk.

Federal Reserve Board rules set forth how the U.S. operations of certain foreign banking organizations ("FBOs"), such as Deutsche Bank, are required to be structured, as well as the enhanced prudential standards that apply to their U.S. operations. Under these rules, a large FBO with U.S.\$ 50 billion or more in U.S. non-branch assets, such as Deutsche Bank, is required to establish or designate a separately capitalized top-tier U.S. intermediate holding company (an "IHC") that holds substantially all of the FBO's ownership interests in its U.S. subsidiaries. The Federal Reserve Board may permit an FBO subject to the U.S. IHC requirement to establish or designate multiple IHCs upon written request. Deutsche Bank has designated two IHCs: DB USA Corporation and DWS USA Corporation. DWS USA Corporation is a subsidiary of DWS Group GmbH & Co. KGaA, which is approximately 80 % owned by Deutsche Bank and which holds the bank's Asset Management division and subsidiaries. Each IHC is subject, on a consolidated basis, to the risk-based and leverage capital requirements under the U.S. Basel 3 capital framework, capital planning and stress testing requirements, U.S. liquidity buffer requirements and other enhanced prudential standards comparable to those applicable to large U.S. banking organizations. Each IHC is also subject to supplementary leverage ratio requirements.

On October 10, 2019, the Federal Reserve Board finalized rules to categorize the U.S. operations of large FBOs based on size, complexity and risk for purposes of tailoring the application of the U.S. enhanced prudential standards (the "Tailoring Rules"). The Tailoring Rules do not significantly change the capital requirements that apply to DB USA Corporation or DWS USA Corporation, although they provide the option to comply with certain simplifications to the capital requirements. However, the Tailoring Rules provide modest relief for Deutsche Bank's IHCs with respect to applicable liquidity requirements so long as the IHCs' combined weighted short term wholesale funding remains below \$75 billion.

The Federal Reserve Board has the authority to examine an IHC, such as DB USA Corporation and DWS USA Corporation, and its subsidiaries, as well as U.S. branches and agencies of FBOs, such as Deutsche Bank's New York branch. An FBO's U.S. branches and agencies are not required to be held beneath an IHC; however, the U.S. branches and agencies of an FBO are subject to certain separate liquidity requirements, as well as other enhanced prudential standards applicable to the combined U.S. operations, such as risk management and oversight and, under certain circumstances, asset maintenance requirements. Additionally, the Tailoring Rules also placed requirements on the FBO itself related to the adequacy and reporting of the FBO's home country capital and stress testing regime.

In June 2018 and October 2019, the Federal Reserve Board finalized rules relating to single counterparty credit limits that apply to the combined U.S. operations and IHCs of certain large FBOs, including Deutsche Bank. Under these rules, Deutsche Bank's IHCs are prohibited from having net credit exposure to a single unaffiliated counterparty in excess of 25 percent of the respective IHC's tier 1 capital. Deutsche Bank's combined U.S. operations (including its IHCs and New York branch) would have become separately subject to similar restrictions beginning July 1, 2021 unless Deutsche Bank AG certified compliance with a home country large exposure regime that is consistent with the Basel large exposure framework. Deutsche Bank AG has availed itself of substituted compliance through certification for its combined U.S. operations, as the European Union's framework became effective on June 28, 2021.

As a bank holding company with assets of U.S.\$ 250 billion or more, Deutsche Bank AG is required under Title I of the Dodd-Frank Act to prepare and submit to the Federal Reserve Board and the Federal Deposit Insurance Corporation ("FDIC") either a full or targeted resolution plan (the "U.S. Resolution Plan") on a timeline prescribed by such agencies. The U.S. Resolution Plan must demonstrate that Deutsche Bank AG has the ability to execute a strategy for the orderly resolution of its designated U.S. material entities and operations. For foreign-based companies subject to these resolution planning requirements such as Deutsche Bank AG, the U.S. Resolution Plan relates only to subsidiaries, branches, agencies and businesses that are domiciled in or whose activities are carried out in whole or in material part in the United States. Deutsche Bank's U.S. Resolution Plan describes the single point of entry strategy for Deutsche Bank's U.S. material entities and operations and prescribes that DB USA Corporation would provide liquidity and capital support to its U.S. material entity subsidiaries and ensure their solvent wind-down outside of applicable resolution proceedings. By December 17, 2021, Deutsche Bank filed its first 'targeted' 2021 U.S. Resolution Plan, which described the core elements of Deutsche Bank's U.S. resolution strategy — such as capital, liquidity, and recapitalization strategies — as well as how Deutsche Bank has integrated lessons learned from its response to the COVID-19 pandemic into its resolution planning process. On December 16, 2022, the Federal Reserve Board and the FDIC announced the results of their review of Deutsche Bank's 2021 U.S. Resolution Plan, as well as those of other banks and did not find any shortcomings or deficiencies in Deutsche Bank's plan. In their feedback letter to Deutsche Bank, the agencies noted areas where further progress will help improve resolvability, which Deutsche Bank must address in its next full resolution plan submission, which is due on July 1, 2024.

DB USA Corporation and DWS USA Corporation are each subject, on an annual basis, to the Federal Reserve Board's supervisory stress testing and capital requirements. DB USA Corporation and DWS USA Corporation are also subject to the Federal Reserve's Comprehensive Capital Analysis and Review ("CCAR"), which is an annual supervisory exercise that assesses the capital positions and planning practices of large bank holding companies and IHCs. On June 23, 2022, the Federal Reserve Board publicly released the results of its annual supervisory stress test, which showed that DB USA Corporation and DWS USA Corporation would continue to have capital levels above minimum requirements even under the stress test's severely adverse scenario. DB USA Corporation and DWS USA Corporation submitted their annual capital plans in April 2022 and will make their next capital plan submissions to the Federal Reserve Board in April 2023. Following amendments in 2020, the CCAR process combines the CCAR quantitative assessment and the buffer requirements in the Federal Reserve Board's capital rules to create an integrated capital buffer requirement. The amendments eliminated the quantitative and qualitative 'pass/fail' assessments from CCAR and modified the static capital conservation buffer to incorporate an institution-specific stress capital buffer (SCB), which is floored at 2.5%. The stress capital buffer equals (i) a bank holding company's projected peak-to-trough decline in common equity tier 1 capital under the annual CCAR supervisory severely adverse stress testing scenario prior to any planned capital actions, plus (ii) one year of planned common stock dividends. The stress capital buffer is reset each year. On August 4, 2022, the Federal Reserve Board announced an SCB for each CCAR firm based on 2022 supervisory stress testing results, which for DB USA Corporation was 4.5% and for DWS USA Corporation was 8.7%. This SCB became effective October 1, 2022 and will remain in effect until September 30, 2023, at which point the size of the SCB for each of Deutsche Bank's IHCs will be recalibrated based on the results of the 2023 stress tests, which are expected to be released in June 2023.

Large U.S. bank holding companies and certain of their subsidiary depository institutions are subject to liquidity coverage ratio ("LCR") requirements that are generally consistent with the Basel Committee's revised Basel 3 liquidity standards. These LCR requirements are applicable to DB USA Corporation, DWS USA Corporation and DBTCA. The Tailoring Rules reduced the LCR requirements applicable to these entities from 100 to 85 percent coverage of net outflows over a projected 30-day period.

On October 20, 2020, the Federal Reserve Board and other U.S. regulators finalized rules implementing the second element of the Basel 3 liquidity framework, the net stable funding ratio ("NSFR"). Under the Tailoring Rules, DB USA Corporation, DWS USA Corporation and DBTCA are subject a reduced NSFR requirement, reflecting 85 percent of the required stable funding amount, so long as the IHCs' combined weighted short term wholesale funding remains below \$75 billion. Effective July 1, 2021, these firms are required to calculate the NSFR on a daily basis. Beginning in 2023, these firms will be required to publicly report NSFR information on a periodic basis.

On December 15, 2016, the Federal Reserve Board adopted final rules that implement a U.S. version of the FSB's TLAC standard in the United States. The final rules require, among other things, the U.S. IHCs of non-U.S. G-SIBs, including DB USA Corporation and DWS USA Corporation, to maintain a minimum TLAC amount, and separately require them to maintain a minimum amount of eligible long-term debt. Under the final rules, the required TLAC amount and the ability or inability of the IHC to count long-term debt issued externally towards the requirements varies depending on the G-SIB's planned resolution strategy. DB USA Corporation and DWS USA Corporation are each considered a "non-resolution covered IHC", which means that they are intended, under the planned global resolution strategy of their G-SIB parent (Deutsche Bank AG), to continue to operate outside of resolution proceedings while the G-SIB parent is subject to a bail-in under the applicable European resolution regime. The final rules require a "non-resolution covered IHC" to maintain (i) internal minimum TLAC of at least 16% of its risk-weighted assets, 6% of its Basel 3 leverage ratio denominator and 8% of its average total consolidated assets, and (ii) internal eligible long-term debt of at least 6% of its risk-weighted assets, 2.5% of its Basel 3 leverage ratio denominator and 3.5% of its average total consolidated assets. Eligible long-term debt instruments for non-resolution covered IHCs are required to meet certain criteria, including issuance to a foreign company that controls directly or indirectly the covered IHC or a foreign affiliate (a non-U.S. entity that is wholly owned, directly or indirectly, by the non-U.S. G-SIB) and the inclusion of a contractual trigger allowing for, in limited circumstances, the immediate conversion or exchange of some or all of the instrument into Common Equity Tier 1 instruments upon an order by the Federal Reserve Board. Internal TLAC requirements may be satisfied with a combination of eligible long-term debt instruments and Tier 1 capital. Each of DB USA Corporation and DWS USA Corporation would also face restrictions on its discretionary bonus payments and capital distributions if it fails to maintain a TLAC buffer consisting of Common Equity Tier 1 capital above the minimum TLAC requirement equal to 2.5% of risk-weighted assets. The final rules also prohibit or limit the ability of DB USA Corporation and DWS USA Corporation to engage in certain types of financial transactions.

Furthermore, the Dodd-Frank Act provides for an extensive framework for the regulation of over-the-counter ("OTC") derivatives, including mandatory clearing, exchange trading and transaction reporting of certain OTC derivatives, as well as rules regarding registration, capital, margin, business conduct standards, recordkeeping and other requirements for swap dealers, security-based swap dealers, major swap participants and major security-based swap participants. The Commodity Futures Trading Commission ("CFTC") has adopted rules implementing the most significant provisions of the Dodd-Frank Act. More recently, in October 2020, also pursuant to the Dodd-Frank Act, the CFTC finalized regulations to impose position limits on certain commodities and economically equivalent swaps, futures and options. In July 2020, the CFTC adopted final rules on the cross-border application of U.S. swap rules, building on the CFTC's cross-border guidance from 2013 and related no-action relief letters. The Securities and Exchange Commission ("SEC") has also finalized rules regarding registration, capital, margin, risk-mitigation techniques, trade reporting, business conduct standards, trade acknowledgement and verification requirements, recordkeeping and financial reporting, and cross-border requirements for security-based swap dealers. These rules generally came into effect in November 2021, the first compliance date for registration of security-based swap dealers and major security-based swap participants. Finally, the Federal Reserve Board, the FDIC, the Office of the Comptroller of the Currency, the Farm Credit Administration and the Federal Housing Finance Agency have adopted final rules establishing margin requirements for non-cleared swaps and security-based swaps that are applicable to swap dealers and security-based swap dealers that are subject to U.S. prudential regulations in lieu of the CFTC's and SEC's margin rules. The final margin rules were phased in from September 2016 through September 2022.

The Dodd-Frank Act also established a new regime for the orderly liquidation of failing financial companies through the appointment of the FDIC as receiver that is available only if the U.S. Secretary of the Treasury determines in consultation with the U.S. President that certain criteria are met, including that the failure of the company and its resolution under otherwise applicable federal or state law would have serious adverse effects on U.S. financial stability. In addition, the Dodd-Frank Act requires U.S. regulatory agencies to prescribe regulations with respect to incentive-based compensation at financial institutions in order to prevent inappropriate behavior that could lead to a material financial loss, though such rules have not yet been proposed. Other provisions require issuers with securities listed on U.S. stock exchanges, which include foreign private issuers such as Deutsche Bank, to establish a "claw back" policy to recoup previously awarded executive compensation in the event of an accounting restatement; in November 2022, the SEC adopted rules to implement this provision of the Dodd-Frank Act that cover foreign private issuers. The New York Stock Exchange (NYSE), on which Deutsche Bank's ordinary shares are listed, filed proposed listing standards to implement these rules on February 22, 2023; these listing standards must be effective no later than November 28, 2023, and NYSE-listed issuers, such as Deutsche Bank, are required to adopt a compensation recovery policy pursuant thereto no later than 60 days following the effective date. The Dodd-Frank Act also grants the SEC discretionary rule-making authority to impose a new fiduciary standard on brokers, dealers and investment advisers; pursuant to this authority, on June 5, 2019, the SEC adopted rules and interpretations applicable to the relationships between such entities and their retail customers, and full compliance was required on June 30, 2020. The Dodd-Frank Act also expands the extraterritorial jurisdiction of U.S. courts over actions brought by the SEC or the United States with respect to violations of the antifraud provisions of the Securities Act of 1933, the Securities Exchange Act of 1934 and the Investment Advisers Act of 1940.

Regulatory Authorities

Deutsche Bank AG as well as its wholly owned subsidiary DB USA Corporation are bank holding companies under the U.S. Bank Holding Company Act of 1956, as amended (the “Bank Holding Company Act”), by virtue of, among other things, their ownership of DBTCA. Deutsche Bank AG and DB USA Corporation have elected to be financial holding companies pursuant to the provisions of the Gramm-Leach-Bliley Act (the “GLB Act”) and, accordingly, may affiliate with securities firms and engage in other activities that are financial in nature or incidental or complementary to activities that are financial in nature. As a bank holding company and financial holding company, Deutsche Bank’s U.S. operations are subject to regulation, supervision and examination by the Federal Reserve Board as Deutsche Bank’s U.S. “umbrella supervisor”.

DBTCA is a New York state-chartered bank whose deposits are insured by the FDIC to the extent permitted by law. DBTCA is subject to regulation, supervision and examination by the Federal Reserve and the New York State Department of Financial Services and to applicable FDIC rules. In addition, DBTCA is also subject to regulation by the Consumer Financial Protection Bureau in relation to retail products and services offered to its customers. Deutsche Bank Trust Company Delaware is a Delaware state-chartered bank which is subject to regulation, supervision and examination by the FDIC and the Office of the State Bank Commissioner of Delaware. Deutsche Bank AG’s New York branch is supervised by the Federal Reserve and the New York State Department of Financial Services. Deutsche Bank’s federally chartered non-depository trust companies are subject to regulation, supervision and examination by the Office of the Comptroller of the Currency. Deutsche Bank and its subsidiaries are also subject to regulation, supervision and examination by state banking regulators of certain states in which they conduct banking operations.

Restrictions on Activities

As described below, federal and state banking laws and regulations restrict Deutsche Bank’s ability to engage, directly or indirectly through subsidiaries, in activities in the United States. Among other requirements, Deutsche Bank and its subsidiaries are required to obtain the prior approval of the Federal Reserve Board before directly or indirectly acquiring the ownership or control of more than 5% of any class of voting shares of U.S. banks, certain other depository institutions, and bank or depository institution holding companies. Under applicable U.S. federal banking law, Deutsche Bank’s U.S. banking operations are also restricted from engaging in certain “tying” arrangements involving products and services.

Deutsche Bank’s two U.S. FDIC-insured bank subsidiaries, as well as its New York branch, are subject to requirements and restrictions under federal and state law, including requirements to maintain reserves against deposits, restrictions on the types and amounts of loans that may be made and the interest that may be charged thereon, and limitations on the types of investments that may be made and the types of services that may be offered.

In addition to the business of banking, and managing or controlling banks, so long as Deutsche Bank is a financial holding company under U.S. law, it and its subsidiaries may also engage in nonbanking activities in the United States that are financial in nature, or incidental or complementary to such financial activity, including certain securities, merchant banking, insurance and other financial activities, subject to certain limitations on the conduct of such activities and to notice or prior regulatory approval in some cases. As a non-U.S. bank, Deutsche Bank AG and its non-U.S. subsidiaries are generally authorized under U.S. law and regulations to acquire a non-U.S. company engaged in nonfinancial activities as long as that company’s U.S. operations do not exceed certain thresholds and certain other conditions are met.

In November 2018, the Federal Reserve Board adopted a revised supervisory rating system for bank holding companies with U.S.\$ 100 billion or more in total consolidated assets and for IHCs with U.S.\$ 50 billion or more in total consolidated assets, such as DB USA Corporation. The revised system also generally applies to DWS USA Corporation. Under the revised system, covered companies receive separate ratings from the Federal Reserve for (i) capital planning and positions, (ii) liquidity risk management and positions and (iii) governance and controls. Each of these component areas will receive one of the following four ratings: (i) Broadly Meets Expectations, (ii) Conditionally Meets Expectations, (iii) Deficient-1, and (iv) Deficient-2. A covered company must maintain a rating of Broadly Meets Expectations or Conditionally Meets Expectations for each of the three components to be considered “well managed.”

In February 2021, the Federal Reserve Board issued guidance, initially proposed in August 2017, intended to enhance the effectiveness of boards of directors and refocus the Federal Reserve Board’s supervisory expectations for boards of directors on their core responsibilities, and also to delineate between roles and responsibilities for boards of directors and for senior management. Although the proposed guidance does not directly apply to DB USA Corporation or DWS USA Corporation, the Federal Reserve Board indicated that it expects to issue a separate proposal on governance specific to IHCs, but has not done so to date.

A financial institution's status as a financial holding company, and resulting ability to engage in a broader range of nonbanking activities, are dependent on the institution and its subsidiary IHCs and insured U.S. depository institutions qualifying as "well capitalized" and "well managed" under applicable regulations and upon the insured U.S. depository institutions meeting certain requirements under the Community Reinvestment Act. The Federal Reserve Board's and other U.S. regulators' "well capitalized" standards are generally based on specified quantitative thresholds set at levels above the minimum requirements to be considered "adequately capitalized." For Deutsche Bank's two insured depository institution subsidiaries, DBTCA and Deutsche Bank Trust Company Delaware, the well-capitalized thresholds under the U.S. Basel 3 framework are a Common Equity Tier 1 capital ratio of 6.5%, a Tier 1 capital ratio of 8%, a Total capital ratio of 10%, and a U.S. leverage ratio of 5%. For bank holding companies, including Deutsche Bank AG and DB USA Corporation, the well-capitalized thresholds are a Tier 1 capital ratio of 6% and a Total capital ratio of 10%, both of which in the case of Deutsche Bank AG are calculated for Deutsche Bank AG under its home country standards.

State-chartered banks (such as DBTCA) and state-licensed branches and agencies of foreign banks (such as the New York branch) may not, with certain exceptions that require prior regulatory approval, engage as a principal in any type of activity not permissible for their federally chartered or licensed counterparts. In addition, DBTCA and Deutsche Bank Trust Company Delaware are subject to their respective state banking laws pertaining to legal lending limits and permissible investments and activities. Likewise, the United States federal banking laws also subject state-licensed branches and agencies to the single-borrower lending limits that apply to federally licensed branches or agencies, which are substantially similar to the lending limits applicable to national banks. The single-borrower lending limits applicable to branches and agencies are calculated based on the dollar equivalent of the capital of the foreign bank (i.e., Deutsche Bank AG in the case of the New York branch).

The Federal Reserve Board may terminate the activities of any U.S. office of a foreign bank if it determines that the foreign bank is not subject to comprehensive supervision on a consolidated basis in its home country or that there is reasonable cause to believe that such foreign bank or its affiliate has violated the law or engaged in an unsafe or unsound banking practice in the United States or, for a foreign bank that presents a risk to the stability of the United States financial system, the home country of the foreign bank has not adopted, or made demonstrable progress toward adopting, an appropriate system of financial regulation to mitigate such risk.

Also, under the so-called swaps "push-out" provisions of the Dodd-Frank Act, certain structured finance derivatives activities of FDIC-insured banks and U.S. branch offices of foreign banks (including Deutsche Bank's New York branch) are restricted.

There are various qualitative and quantitative restrictions on the extent to which Deutsche Bank and its nonbank subsidiaries can borrow or otherwise obtain credit from Deutsche Bank's U.S. banking subsidiaries or engage in certain other transactions involving those subsidiaries, including derivative transactions and securities borrowing or lending transactions. In general, these transactions must be on terms that would ordinarily be offered to unaffiliated entities, must be secured by designated amounts of specified collateral and are subject to volume limitations. These restrictions also apply to certain transactions of Deutsche Bank's New York branch with its U.S. broker-dealers and certain of its other U.S. affiliates.

A major focus of U.S. governmental policy relating to financial institutions is aimed at preventing money laundering and terrorist financing and compliance with economic sanctions in respect of designated countries or activities. Failure of an institution to have policies and procedures and controls in place to prevent, detect and report money laundering and terrorist financing could in some cases have serious legal, financial and reputational consequences for the institution.

New York Branch

The New York branch of Deutsche Bank AG is licensed by the Superintendent of the New York State Department of Financial Services to conduct a commercial banking business and is required to maintain and pledge eligible high-quality assets with banks in the State of New York. The Superintendent of Financial Services may also impose asset maintenance requirements on foreign banks with branch offices in New York. In addition, the Federal Reserve Board is authorized to impose institution-specific asset maintenance requirements under certain conditions, pursuant to the Tailoring Rules.

The New York State Banking Law authorizes the Superintendent of Financial Services to take possession of the business and property of a New York branch of a foreign bank under certain circumstances, generally involving violation of law, conduct of business in an unsafe manner, impairment of capital, suspension of payment of obligations, or initiation of liquidation proceedings against the foreign bank at its domicile or elsewhere. In liquidating or dealing with a branch's business after taking possession of a branch, only the claims of depositors and other creditors which arose out of transactions with a branch are to be accepted by the Superintendent of Financial Services for payment out of the business and property of the foreign bank in the State of New York or in the U.S. and reflected on the books of the New York branch, without prejudice to the rights of the holders of such claims to be satisfied out of other assets of the foreign bank. After such claims are paid, the Superintendent of Financial Services will turn over the remaining assets, if any, first to the liquidators of other offices of the foreign bank that are being liquidated in the United States and then, if any assets remain, to the foreign bank or its duly appointed liquidator or receiver.

The New York branch's deposits and other note obligations are not permitted to be, and are not, insured by the FDIC. In general, under the International Banking Act and FDIC regulations, the New York branch is not permitted to engage in domestic retail deposit activity (accepting an initial deposit of less than US\$250,000). The New York branch may not engage as principal in any type of activity that is not permissible for a federally licensed branch of a foreign bank unless the Federal Reserve Board has determined that such activity is consistent with sound banking practice. The New York branch must also comply with the same single borrower (or issuer) lending and investment limits applicable to federally licensed branches, which are substantially similar to the lending limits applicable to national banks, as well as those imposed by the New York State Banking Law. The lending limits applicable to the New York branch take into account credit exposures from derivative transactions. These limits are based on the foreign banks worldwide capital. In addition, regulations that the U.S. Financial Stability Oversight Council or other regulators may adopt could affect the nature of the activities which the New York branch may conduct, and may impose restrictions and limitations on the conduct of such activities.

Deutsche Bank Trust Company Americas

The Federal Deposit Insurance Corporation Improvement Act of 1991 ("FDICIA") provides for extensive regulation of depository institutions (such as DBTCA and its direct and indirect parent companies), including requiring federal banking regulators to take "prompt corrective action" with respect to FDIC-insured banks that do not meet minimum capital requirements. As an insured bank's capital level declines and the bank falls into lower categories (or if it is placed in a lower category by the discretionary action of its supervisor), greater limits are placed on its activities and federal banking regulators are authorized (and, in many cases, required) to take increasingly more stringent supervisory actions, which could ultimately include the appointment of a conservator or receiver for the bank (even if it is solvent). In addition, FDICIA generally prohibits an FDIC-insured bank from making any capital distribution (including payment of a dividend) or payment of a management fee to its holding company if the bank would thereafter be undercapitalized. If an insured bank becomes "undercapitalized", it is required to submit to federal regulators a capital restoration plan guaranteed by the bank's holding company. Since the enactment of FDICIA, both of Deutsche Bank's U.S. insured bank subsidiaries have maintained capital above the "well capitalized" standards, the highest capital category under applicable regulations.

DBTCA, like other FDIC-insured banks, is required to pay assessments to the FDIC for deposit insurance under the FDIC's Deposit Insurance Fund (calculated using the FDIC's risk-based assessment system). The minimum reserve ratio for the Deposit Insurance Fund was increased under the Dodd-Frank Act from 1.15% to 1.35%. After having reached 1.35% as of September 30, 2018, the reserve ratio had declined below that amount following extraordinary growth in insured deposits across the banking industry in the first and second quarters of 2020. In response to this, the FDIC adopted a restoration plan to restore the Deposit Insurance Fund to 1.35% by September 28, 2028. The restoration plan, as amended, incorporates an increase in initial base deposit assessment rate schedules uniformly by two basis points beginning in the first quarterly assessment period of 2023. Such increase is applicable to insured depository institutions generally, including to DBTCA. In addition, the FDIC has set the designated reserve ratio at 2% as a long-term goal. The FDIC's standard maximum deposit insurance amount per depositor at an insured depository institution is U.S.\$ 250,000.

Other

In the United States, Deutsche Bank's U.S.-registered broker-dealer subsidiaries are regulated by the SEC. Broker-dealers are subject to regulations that cover all aspects of the securities business, including sales methods, trade practices among broker-dealers, use and safekeeping of customers' funds and securities, capital structure, recordkeeping, the financing of customers' purchases and the conduct of directors, officers and employees.

Deutsche Bank's principal U.S. SEC-registered broker-dealer subsidiary, Deutsche Bank Securities Inc., is a member of the New York Stock Exchange (and other securities exchanges) and is regulated by the Financial Industry Regulatory Authority, Inc. ("FINRA") and the individual state securities authorities in the states in which it operates. The U.S. government agencies and self-regulatory organizations, as well as state securities authorities in the United States having jurisdiction over Deutsche Bank's U.S. broker-dealer affiliates, are empowered to conduct administrative proceedings that can result in censure, fine, the issuance of cease-and-desist orders or the suspension or expulsion of a broker-dealer or its directors, officers or employees. Deutsche Bank Securities Inc. is also registered with and regulated by the SEC as an investment adviser, and by the CFTC and the National Futures Association as a futures commission merchant and commodity pool operator.

Under the Dodd-Frank Act, with certain exceptions, entities that are swap dealers, security-based swap dealers, major swap participants or major security-based swap participants are required to register with the SEC or CFTC, or both. Currently, Deutsche Bank AG is provisionally registered as a swap dealer with the CFTC and is conditionally registered as a security-based swap dealer with the SEC. Registration, including provisional and conditional registration, as a swap dealer, security-based swap dealer, major swap participant or major security-based swap participant subjects the registrant to requirements as to capital, margin, business conduct and recordkeeping, among other requirements.

Organizational Structure

In 2022, Deutsche Bank operated its business along the structure of four corporate divisions and the Capital Release Unit. Deutsche Bank AG is the direct or indirect holding company for its subsidiaries. The following table sets forth the significant subsidiaries the Group owns, directly or indirectly, as of December 31, 2022. Deutsche Bank used the three-part test set out in Section 1-02 (w) of Regulation S-X under the U.S. Securities Exchange Act of 1934 to determine significance. The bank does not have any other subsidiaries it believes are material based on other less quantifiable factors.

Deutsche Bank owns 100 % of the equity and voting interests in these subsidiaries except for DWS Group GmbH & Co. KGaA, of which it owns 79.49 % of equity and voting interests. These subsidiaries are included in the consolidated financial statements and prepare standalone financial statements as of December 31, 2022. The principal countries of operations are the same as the countries of incorporation.

Subsidiary	Place of Incorporation
DB USA Corporation ¹	Delaware, United States
Deutsche Bank Americas Holding Corporation ²	Delaware, United States
DB U.S. Financial Markets Holding Corporation ³	Delaware, United States
Deutsche Bank Securities Inc. ⁴	Delaware, United States
Deutsche Bank Trust Corporation ⁵	New York, United States
Deutsche Bank Trust Company Americas ⁶	New York, United States
Deutsche Bank Luxembourg S.A. ⁷	Luxembourg
DB Beteiligungs-Holding GmbH ⁸	Frankfurt am Main, Germany
DWS Group GmbH & Co. KGaA ⁹	Frankfurt am Main, Germany

¹ DB USA Corporation is the top-level holding company for its subsidiaries in the United States.

² Deutsche Bank Americas Holding Corporation is a second tier holding company for subsidiaries in the United States.

³ DB U.S. Financial Markets Holding Corporation is a second tier holding company for subsidiaries in the United States.

⁴ Deutsche Bank Securities Inc. is a U.S. company registered as a broker dealer and investment advisor with the Securities and Exchange Commission and as a futures commission merchant with the Commodities Futures Trading Commission.

⁵ Deutsche Bank Trust Corporation is a bank holding company under Federal Reserve Board regulations.

⁶ Deutsche Bank Trust Company Americas is a New York State-chartered bank and member of the Federal Reserve System. It originates loans and other forms of credit, accepts deposits, arranges financings and provides numerous other commercial banking and financial services.

⁷ The company's primary business model comprises loan business with international clients (Corporate Bank & Investment Bank), where the bank acts globally as lending office and as risk transfer hub for the Strategic Corporate Lending of Deutsche Bank, as well as structured finance activities covering long-term infrastructure projects and high quality investment goods. Furthermore, the bank offers tailor-made solutions with a wide range of products and services to their ultra-high-net-worth (UHNW) clients.

⁸ The company holds the majority stake in DWS Group GmbH & Co. KGaA.

⁹ The company is a partnership limited by shares (Kommanditgesellschaft auf Aktien) with a German limited liability company (Gesellschaft mit beschränkter Haftung) as a general partner. The business purpose of the company is the holding of participations in as well as the management and support of a group of financial services providers. Following the public listing on March 23, 2018 on the Frankfurt Stock Exchange Deutsche Bank Group owns 79.49 % of equity and voting interests in the entity.

Property and Equipment

As of December 31, 2022, Deutsche Bank operated in 58 countries out of 1,536 branches around the world, of which 66 % were in Germany. The Group leases a majority of its offices and branches under long-term agreements.

The bank continues to review its property requirements worldwide taking into account cost containment measures as well as growth initiatives in selected businesses. Please see Note 21 "Property and Equipment" to the consolidated financial statements for further information.

Information required by subpart 1400 of SEC Regulation S-K

Please see pages S-1 through S-10 of the Supplemental Financial Information (Unaudited), which pages are included herein, for information required by subpart 1400 of SEC Regulation S-K.

Item 4A: Unresolved Staff Comments

Deutsche Bank has not received written comments from the Securities and Exchange Commission regarding its periodic reports under the Exchange Act, as of any day 180 days or more before the end of the fiscal year to which this Annual Report relates, which remain unresolved.

Item 5: Operating and Financial Review and Prospects

Overview

The following discussion and analysis should be read in conjunction with the consolidated financial statements and the related notes to them included in “Item 18: Financial Statements” of this document, on which we have based this discussion and analysis.

The Group has prepared its consolidated financial statements in accordance with IFRS as issued by the International Accounting Standards Board.

Significant Accounting Policies and Critical Accounting Estimates

The Group’s significant accounting policies are essential to understanding its reported results of operations and financial condition. Certain of these accounting policies require critical accounting estimates that involve complex and subjective judgments and the use of assumptions, some of which may be for matters that are inherently uncertain and susceptible to change. Such critical accounting estimates could change from period to period and have a material impact on the Bank’s financial condition, changes in financial condition or results of operations. Critical accounting estimates could also involve estimates where management could have reasonably used another estimate in the current accounting period. Actual results may differ from these estimates if conditions or underlying circumstances were to change. See Note 1 “Significant Accounting Policies and Critical Accounting Estimates” to the consolidated financial statements for a discussion on the Group’s significant accounting policies and critical accounting estimates.

Deutsche Bank has identified the following significant accounting policies that involve critical accounting estimates:

- The impairment of associates
- The impairment of loans and provisions for off-balance sheet positions
- The impairment of financial assets at fair value through other comprehensive income
- The determination of fair value
- The recognition of trade date profit
- The impairment of goodwill and other intangibles
- The recognition and measurement of deferred tax assets
- The accounting for legal and regulatory contingencies and uncertain tax positions

Recently Adopted Accounting Pronouncements and New Accounting Pronouncements

See Note 2 “Recently Adopted and New Accounting Pronouncements” to the consolidated financial statements for a discussion on the Group’s recently adopted and new accounting pronouncements.

Operating Results

The following discussion and analysis should be read in conjunction with the bank's consolidated financial statements.

Executive Summary

Please see "Management Report: Operating and Financial Review: Executive Summary" in the Annual Report 2022.

Trends and Uncertainties

For insight into the trends impacting the bank's performance please see the "Management Report: Operating and Financial Review" section of the Annual Report 2022. Key risks and uncertainties for the Bank are discussed in "Item 3: Key Information – Risk Factors".

The bank's aspirations are subject to various external and internal factors, some of which it cannot influence. Timely and complete achievement of its strategic targets or aspirations may be adversely impacted by reduced revenue-generating capacities of some of its core businesses should downside macro-economic and market risks crystallize. These risks include but are not limited to the persistent inflationary and rising policy interest rate trends, the continuing war in Ukraine, a deteriorating macroeconomic environment and elevated geopolitical risks, the ongoing headwinds posed by regulatory reforms and/or the effects on the Bank's legal and regulatory proceedings.

On February 24, 2022, Russia commenced a war in Ukraine. In response to this action, the West has moved to impose broad-based sanctions (including asset-freeze / blocking sanctions) targeting Russia. The sanctions environment continues and will remain dependent on the development of the war in Ukraine, and it is possible that new direct or indirect secondary sanctions could be imposed at short notice as a result of ongoing developments. The impact of the ongoing situation, from both a financial and non-financial risk perspective, remains uncertain and while its direct financial exposures to Russia and Ukraine are contained and have been reduced throughout 2022, higher order effects may materialize in a downside scenario, and impact the Group's ability to meet its stated targets.

The war in Ukraine and the related further increase in global inflationary pressures due to higher energy prices as well as supply chain disruptions have led to a significant downward revision in global growth forecasts for 2023 and 2024. Major central banks have responded by tightening monetary policy and market interest rates increased significantly during the year 2022 amid periods of very high market volatility. The likelihood of at least a moderate economic downturn remains elevated as the effects of higher inflation, higher interest rates and tighter financial conditions weigh on economic activity, including in the U.S. economy as the Federal Reserve leads the global tightening cycle. Bond yields resumed their upward path in the fourth quarter as market participants raised expectations of the terminal policy interest rates by the Fed and the ECB. This could potentially drive increased losses, including higher provisions for credit losses, and may substantially and adversely affect Deutsche Bank's planned results of operations, financial targets and costs. More persistent inflation and higher terminal interest rates could also dampen consumer spending and private client investments and lead to a reduction in new lending for consumer finance and/or private mortgages lending.

The broader geopolitical implications of the war in Ukraine remain uncertain. The U.S. has warned that countries which help Russia to evade sanctions, backfill them or provide military aid may be targets of secondary sanctions. Over the medium to long term, the IMF among others has highlighted the potential impact of deglobalization on living standards and growth.

In addition, regulatory, tax and supervisory requirements continue to evolve. The regulatory reforms, e.g., imposing capital surcharges and implementation of final Basel 3 reforms, enacted and proposed in response to weaknesses identified during the last financial crisis together with the increased regulatory scrutiny and discretion will impose material costs on the bank, create significant uncertainty and may adversely affect the Group's business plans as well as its ability to execute the bank's strategic plans in the medium-term. In 2022, the bank has also seen political pressure arising across European member states regarding the possibility of introducing additional levies or taxes as a means to finance potential transfers to households, to ease the impact of rising prices. Those changes may significantly affect Deutsche Bank's business model, financial condition and results of operation as well as the competitive environment generally. In addition, the Group is involved in litigation, tax examinations, arbitration and regulatory proceedings and investigations. Such matters are subject to many uncertainties.

The impacts of rising global temperatures, and the enhanced focus on climate change and the transition to a net-zero economy from society, regulators and the banking sector have led to new sources of financial and non-financial risks.

The bank's desire to meet its financial targets and objectives also reflects among other things: the operating performance of core businesses; the extent of its restructuring costs and the delivery of associated benefits from change initiatives including for example front-to-back optimization programs; cost related to potential litigation and regulatory enforcement actions; growth in the balance sheet usage of the core businesses; changes in the bank's tax and pensions accounts; impacts on Other Comprehensive Income; and changes in regulation and regulatory technical standards.

Opportunities may arise if macroeconomic conditions and the inflation and interest rate environment improve beyond currently forecasted levels, leading to higher revenues and improving the Group's ability to meet its financial targets. At the same time, higher inflation and interest rate levels and market volatility could lead to increased revenues from trading flows and higher net interest income and lending margins. By focusing on and investing in Deutsche Bank's areas of core strengths, the implementation of its strategy may create further opportunities if implemented to a greater extent or under more favorable conditions than currently anticipated.

Risks to the Corporate Bank's outlook include potential impacts on its business model from macroeconomic and global geopolitical uncertainties, including uncertainties associated with the war in Ukraine, lower economic growth in the major operating countries from ongoing supply chain disruptions, higher energy and commodity prices as well as uncertainty around central bank policies (e.g., the interest rate environment). In addition, ongoing regulatory developments (e.g., the finalization of the Basel III framework) and lower levels of client activity may also have an adverse impact.

There are several risks to the outlook of the Investment Bank in 2023, including potential impacts on the business model from macroeconomic changes, including uncertainties associated with the war in Ukraine, while the second order effects on energy and food prices will continue to have a significant impact on financial markets. Central bank policies, specifically around interest rates and further tapering of asset purchases, create risks, as does the current period of high inflation. In addition, the evolving regulatory framework could lead to unforeseen regulatory compliance costs and possible delays in the implementation of the division's efficiency measures, which could adversely impact its cost base. More broadly, other unforeseen geopolitical event risks may also have an adverse impact.

Risks to Private Bank's outlook include potential impacts on the business model from macroeconomic changes, including uncertainties associated with the war in Ukraine, global inflationary pressures due to higher energy and commodity prices as well as ongoing supply chain disruptions, uncertainty on interest rates, slower economic growth in the major operating countries and lower client activity. Client activity could be impacted by market uncertainties including higher than expected volatility in equity and credit markets. The implementation of regulatory requirements including consumer protection measures and delays in the implementation of strategic projects or changes resulting from contract renegotiations could also have a negative impact on revenues, capital consumption and costs.

Risks to Asset Management's outlook include macro-economic and market conditions, growth prospects and continued economic impact from the war in Ukraine, which could adversely affect its business, results of operations or strategic plans. Elevated levels of economic and political uncertainty worldwide, and protectionist and anti-trade policies, could have unpredictable consequences in the economy, market volatility and investors' confidence, which may lead to declines in business and could affect revenues and profits. In addition, the evolving regulatory framework could lead to unforeseen regulatory compliance costs and possible delays in the implementation of the efficiency measures, which could adversely impact the division's cost base.

Corporate & Other will include the financial impact of the Capital Release Unit from 2023 onwards. Corporate & Other will continue to retain certain transitional costs related to the Group's transfer pricing framework. In addition, there will be charges related to legacy activities relating to the merger of DB Privat- und Firmenkundenbank AG into Deutsche Bank AG. In aggregate, both items are expected to have negative impacts in C&O of approximately € 0.3 billion in 2023. Corporate & Other will also continue to retain shareholder expenses, which are expected to be around € 0.5 billion for the full year 2023, and to record the reversal of Non-controlling interests, primarily from DWS. In addition, results in Corporate & Other will continue to be impacted by valuation and timing differences on positions that are economically hedged, but do not meet the hedge accounting requirements. In total, Corporate & Other is expected to generate a pre-tax loss in 2023.

The effective tax rate in future periods may be influenced by changes in tax laws or interpretative guidance, the occurrence of non-tax deductible litigation and other charges, changes in the measurement of deferred tax assets, or the resolution of tax examinations and investigations.

Results of Operations

Please see “Management Report: Operating and Financial Review: Results of Operations” in the Annual Report 2022 and the Group’s discussion of Non-GAAP financial measures in the “Supplementary Financial Information”.

Financial Position

Please see “Management Report: Operating and Financial Review: Financial Position” in the Annual Report 2022.

Liquidity and Capital Resources

For a detailed discussion of the bank’s liquidity risk management, see “Management Report: Risk Report: Liquidity Risk” in the Annual Report 2022.

For a detailed discussion of the Group’s capital management, see “Management Report: Risk Report: Capital Management” in the Annual Report 2022.

Post-Employment Benefit Plans

Please see “Management Report: Employees: Post-Employment Benefit Plans” in the Annual Report 2022.

Off-Balance Sheet Arrangements

For information on the nature, purpose and extent of the Group’s off-balance sheet arrangements, please see Note 38 “Structured Entities” to the consolidated financial statements. For further information on off-balance sheet arrangements, including allowances for off-balance sheet positions, please refer to “Management Report: Risk Report: Asset Quality: Allowance for Credit Losses” in the Annual Report 2022 and Note 19 “Allowance for Credit Losses” to the consolidated financial statements. For information on irrevocable lending commitments and contingent liabilities with respect to third parties, please see Note 28 “Credit related Commitments” to the consolidated financial statements.

Tabular Disclosure of Contractual Obligations

Please see “Management Report: Operating and Financial Review: Tabular Disclosure of Contractual Obligations” in the Annual Report 2022.

Research and Development, Patents and Licenses

Not applicable.

Item 6: Directors, Senior Management and Employees

Directors and Senior Management

In accordance with the German Stock Corporation Act (Aktiengesetz), Deutsche Bank has a Management Board (Vorstand) and a Supervisory Board (Aufsichtsrat). The German Stock Corporation Act prohibits simultaneous membership on both the Management Board and the Supervisory Board. The members of the Management Board are the executive officers of the company. The Management Board is responsible for managing the company and representing the bank in dealings with third parties. The Supervisory Board oversees the Management Board, appoints and removes its members and determines their remuneration and other compensation components, including pension benefits. According to German law, the Supervisory Board represents Deutsche Bank in dealings with members of the Management Board. Therefore, no members of the Management Board may enter into any agreement for Deutsche Bank without the prior consent of the Supervisory Board.

Age limits for members of the Management Board are defined contractually. Accordingly, the appointment as member of the Management Board shall end in principle with the close of the ordinary general meeting in the year, in which the Management Board Member reaches the retirement age according to the rules of the German statutory pension insurance scheme applicable in Germany for the long-time insured to claim an early retirement pension ("Renteneintrittsalter zur vorzeitigen Inanspruchnahme der Altersrente für langjährig Versicherte"), which is currently 63 years of age. Age limits also exist for the members of the Supervisory Board according to the terms of reference (Geschäftsordnung) for the Supervisory Board. There is a maximum age limit of 70 years for members of the Supervisory Board. In exceptional cases, a Supervisory Board member can be elected or appointed for a period that extends no longer than until the end of the fourth ordinary general meeting that takes place after he/she has reached the age of 70.

The Supervisory Board may not make management decisions. However, German law and Deutsche Bank's Articles of Association (Satzung) require the Management Board to obtain the approval of the Supervisory Board for certain actions. The most important of these actions are:

- Granting of general powers of attorney (Generalvollmachten). A general power of attorney authorizes its holder to represent the company in substantially all legal matters without limitation to the affairs of a specific office
- Acquisitions and disposals (including transactions carried out by a dependent company) of real estate in so far as the object involves more than € 500,000,000
- Granting of credits, including the acquisition of participations in other companies, where the German Banking Act (Kreditwesengesetz) requires approval by the Supervisory Board. In particular, pursuant to the German Banking Act, it requires of the Supervisory Board inter alia the approval if the bank grants a loan (to the extent legally permissible) to a member of the Management Board or the Supervisory Board or one of the bank's employees who holds a procuration (Prokura) or general power of attorney, and
- Acquisitions and disposals (including transactions carried out by a dependent company) of other participations, insofar as the object involves more than € 1 billion. The Supervisory Board must be informed without delay of any acquisition or disposal of such participations involving more than € 500,000,000

The Management Board must submit regular reports or ad-hoc reports, as the case may be, to the Supervisory Board on its current operations and future business planning as well as on its risk situation. The Supervisory Board may also request special reports from the Management Board at any time.

With respect to voting powers, a member of the Supervisory Board or the Management Board may not vote on resolutions open to a vote at a board meeting if the proposed resolution concerns:

- A legal transaction between Deutsche Bank and the respective member, or
- Commencement, settlement or completion of legal proceedings between Deutsche Bank and the respective member

A member of the Supervisory Board or the Management Board may not directly or indirectly exercise voting rights on resolutions open to a vote at a shareholders' meeting (Hauptversammlung, which the bank refers to as the General Meeting) if the proposed resolution concerns:

- Ratification of the member's acts
- A discharge of liability of the member, or
- Enforcement of a claim against the member by the bank.

Supervisory Board and Management Board

In carrying out their duties, members of both the Management Board and Supervisory Board must exercise the standard of care of a prudent and diligent business person, and they are liable to the bank for damages if they fail to do so.

The liability of the members of the Management Board or the Supervisory Board under the German Stock Corporation Act for breach of their fiduciary duties is to the company rather than individual shareholders. However, individual shareholders that hold at least 1 % or € 100,000 of the subscribed capital and are granted standing by the court may also invoke such liability to the company. The underlying concept is that all shareholders should benefit equally from amounts received under this liability by adding such amounts to the company's assets rather than disbursing them to plaintiff shareholders. Deutsche Bank may waive the right to claim damages or settle these claims if at least three years have passed since the alleged breach and if the shareholders approve the waiver or settlement at the General Meeting with a simple majority of the votes cast, and provided that opposing shareholders do not hold, in the aggregate, one tenth or more of its share capital and do not have their opposition formally noted in the minutes maintained by a German notary.

Supervisory Board

The German Co-Determination Act of 1976 (Mitbestimmungsgesetz) requires the bank's Supervisory Board to have twenty members, which is also reflected in the Articles of Association. In the event that the number of members of the Supervisory Board falls below twenty, upon application to a competent court, the court must appoint replacement members to serve on the board until official appointments are made by the general meeting of shareholders (with respect to shareholder representatives) or the employees and their representatives (with respect to employee representatives).

The German Co-Determination Act of 1976 (Mitbestimmungsgesetz) requires that the shareholders elect half of the members of the supervisory board of large German companies, such as Deutsche Bank, and that employees in Germany elect the other half. None of the current members of either of the bank's boards were selected pursuant to any arrangement or understandings with major shareholders, customers or others.

Each member of the Supervisory Board generally serves for a fixed term of approximately five years. For the election of shareholder representatives, the General Meeting may establish that the terms of office of individual members may begin or end on differing dates. Pursuant to German law, the term expires at the latest at the end of the Annual General Meeting that approves and ratifies such member's actions in the fourth fiscal year after the year in which the Supervisory Board member was elected. Supervisory Board members may also be re-elected. The shareholders may, by a majority of the votes cast in a General Meeting, remove any member of the Supervisory Board the shareholders have elected in a General Meeting. The employees may remove any member they have elected by a vote of three-quarters of the employee votes cast.

The members of the Supervisory Board elect the chairperson and the deputy chairperson(s) of the Supervisory Board. Traditionally, the chairperson is a representative of the shareholders, and the first deputy chairperson is a representative of the employees. At least half of the members of the Supervisory Board must be present at a meeting or must have submitted their vote in writing to constitute a quorum. In general, approval by a simple majority of the members of the Supervisory Board present and voting is required to pass a resolution. In the case of a deadlock, the resolution is put to a second vote. In the case of a second deadlock, the chairperson has the deciding vote.

For additional information on Deutsche Bank's Supervisory Board, including a table providing the names of and biographical information for the current members, see "Corporate Governance Statement: Management Board and Supervisory Board: Supervisory Board" in the Annual Report 2022.

Committees of the Supervisory Board

For information on the committees of the bank's Supervisory Board, please see "Corporate Governance Statement: Management Board and Supervisory Board: Committees of the Supervisory Board" in the Annual Report 2022.

The business address of the members of the Supervisory Board is the same as Deutsche Bank's business address, Taunusanlage 12, 60325 Frankfurt am Main, Germany.

Management Board

Deutsche Bank's Articles of Association require the Management Board to have at least three members. The Management Board currently has ten members. The Supervisory Board has also appointed a Chairman (CEO) and two Deputy Chairman (Presidents) of the Management Board.

The Supervisory Board appoints and oversees the members of the Management Board. The initial appointment is for a maximum of three years. Members may be re-appointed or have their terms extended for one or more terms of up to a maximum of five years each, although also re-appointments shall be for a maximum of three years. The Supervisory Board may remove a member of the Management Board prior to the expiration of his or her term for good cause.

Pursuant to Deutsche Bank's Articles of Association, two members of the Management Board, or one member of the Management Board together with a holder of procuration, may represent the bank for legal purposes. A holder of procuration is an attorney-in-fact who holds a legally defined power under German law, which cannot be restricted with respect to third parties. However, pursuant to German law, the Management Board itself must resolve on certain matters as a whole and may not delegate the decision to one or more individual members. In particular, it may not delegate the determination of the bank's business and risk strategies, and the coordinating or controlling responsibilities. The Management Board is required to ensure that shareholders are treated on an equal basis and receive equal information. The Management Board is also responsible for ensuring proper business organization, which includes appropriate and effective risk management as well as compliance with legal requirements and internal guidelines, and for taking the necessary measures to ensure that adequate internal guidelines are developed and implemented.

Other selected responsibilities of the Management Board in accordance with the Terms of Reference for the Management Board and/or German law are:

- Appointing key personnel at the level directly below the Management Board, in particular, appointing the Global Key Function Holders employed by the bank
- Making decisions regarding significant credit exposures or other risks which have not been delegated to individual risk management units
- Acquisition and disposal of equity investments, including capital measures in all cases in which (i) the law or the Articles of Association require approval by the Supervisory Board, or (ii) the equivalent of € 100 million is exceeded
- Acquisition and disposal of real estate – directly or by separate legal entities, in all cases in which: (i) the law or the Articles of Association require approval by the Supervisory Board, or (ii) the real estate's equivalent exceeds € 100 million
- Individual vendor or intra Group-outsourcings (or material changes to those outsourcings) in all cases in which the equivalent of € 100 million is exceeded on an annual basis or include the delegation of core organizational duties of the Management Board
- Calling shareholders' meetings
- Filing petitions to set aside shareholders' resolutions
- Preparing and executing shareholders' resolutions and
- Reporting to the Supervisory Board

For additional information on Deutsche Bank's Management Board, including the names of and biographical information for the current members, see "Corporate Governance Statement: Management Board and Supervisory Board: Management Board" in the Annual Report 2022. The Terms of Reference of the Management Board are published on the bank's website www.db.com/ir/en/documents.htm.

Board Practices of the Management Board

The Terms of Reference for the Management Board are in accordance with the Supervisory Board resolution of October 29, 2021. These Terms of Reference provide that the members of the Management Board have the collective responsibility for managing Deutsche Bank. Notwithstanding this principle, the allocation of functional responsibilities to the individual members of the Management Board and member substitutions (in case of temporary absence) are set out in the Business Allocation Plan for the Management Board in accordance with the Supervisory Board resolution of February 1, 2023. The allocation of functional responsibilities does not exempt any member of the Management Board from collective responsibility for the management of the business. The members of the Management Board are responsible for the proper performance and/or delegation of its duties and the clear allocation of accountabilities and responsibilities within the area of its functional responsibility (so-called “*Ressort*”) in accordance with the Business Allocation Plan.

Members of the Management Board are bound to the corporate interest of Deutsche Bank. No member of the Management Board may pursue personal interests in his or her decisions or use business opportunities intended for the company for himself/herself. To the extent permitted by German law, individual members of the Management Board may assume mandates outside of Deutsche Bank Group, honorary offices or special assignments. In order to effectively prevent any conflicts of interest, the members of the Management Board may accept such positions only upon the approval of the other members of the Management Board and the Chairman’s Committee of the Supervisory Board. Management Board members generally do not accept the role of chair of supervisory boards of companies outside the Group.

Section 161 of the German Stock Corporation Act requires that the management board and supervisory board of any German stock exchange-listed company declare annually that the company complies with the recommendations of the German Corporate Governance Code or, if not, which recommendations the company does not comply with and why it does not comply with these recommendations (so-called “comply or explain”-principle). On some points, these recommendations go beyond the requirements of the German Stock Corporation Act. The Management Board and Supervisory Board issued a new Declaration of Conformity in accordance with Section 161 of the German Stock Corporation Act in October 2022, which is available on the bank’s internet website at www.db.com/ir/en/documents.htm under the heading “Declaration of Conformity pursuant to Section 161 German Stock Corporation Act (AktG), Oct 2022”.

For information on the Management Board’s terms of office, please see “Corporate Governance Statement: Management Board and Supervisory Board: Management Board” in the Annual Report 2022. For details of the Management Board’s service contracts providing benefits upon termination, please see “Compensation Report: Benefits as of the end of the mandate” and “Compensation Report: Benefits upon Early Termination” in the Management Report of the Annual Report 2022.

The allocation of functional responsibilities to the individual members of the Management Board is described in the Business Allocation Plan for the Management Board, which sets the framework for the delegation of responsibilities to senior management below the Management Board. The Management Board endorses individual accountability of senior position holders as opposed to joint decision-taking in committees. At the same time, the Management Board recognizes the importance of having comprehensive and robust information across all businesses in order to take well informed decisions and established, in addition to Infrastructure Committees, Business Executive Committees and Regional Committees, the “Group Management Committee” which aims to improve the information flow across the Corporate Divisions and between the Corporate Divisions and the Management Board. The Group Management Committee as a senior platform, which is not required by the German Stock Corporation Act, is composed of all Management Board members as well as most senior business representatives to exchange information and discuss business, growth and profitability.

Compensation

For information on the compensation of the members of the bank’s Management Board, see Compensation Report: Management Board Compensation Report” in the Annual Report 2022.

For information on the compensation of the members of the bank’s employees, see Compensation Report: Employee Compensation Report” in the Annual Report 2022.

For information on the compensation of the members of the bank’s Supervisory Board, see Compensation Report: Compensation System for Supervisory Board Members” in the Annual Report 2022.

Employees

Labor Relations

In Germany, labor unions and employers' associations generally negotiate collective bargaining agreements on salaries and benefits for employees below the management level. Many companies in Germany, including Deutsche Bank and its material German subsidiaries, are members of the employers' association and are bound by collective bargaining agreements.

Accordingly, the bank's employers' association, the "Arbeitgeberverband des privaten Bankgewerbes e.V.", regularly renegotiates the collective bargaining agreements that cover many of the Group's employees. The last agreement was reached in April 2022. As part of the final package, salaries were increased in two stages by a total of 5.0%: 3.0% from August 2022 and a further 2.0% from August 2023. In addition, a one-time payment of € 500 in April 2022 and a further € 500 in February 2023 was agreed for all entitled employees. This collective wage agreement will last until end of May 2024.

Deutsche Bank's employers' association negotiates with the following unions:

- ver.di (Vereinigte Dienstleistungsgewerkschaft)
- Deutscher Bankangestellten Verband (DBV – Gewerkschaft der Finanzdienstleister)

Many employees of Deutsche Bank, who are former employees of the merged Postbank, are covered by in-house collective bargaining agreements that are agreed between Deutsche Bank and trade unions directly. The last agreement was reached in March 2022. As part of the final package, salaries were increased in two stages by a total of 5.2%: 3.1% from June 2022 and a further 2.1% from February 2023. In addition, a one-time payment of EUR 750 in May 2022 and a further EUR 500 in January 2023 was agreed for all entitled employees. This collective wage agreement will last until end of January 2024.

In the afore mentioned context Deutsche Bank negotiates with the following unions:

- ver.di (Vereinigte Dienstleistungsgewerkschaft)
- Deutscher Bankangestellten Verband (DBV – Gewerkschaft der Finanzdienstleister)
- Kommunikationsgewerkschaft DPV (DPVKOM)
- komba gewerkschaft (komba)

As German law prohibits the bank from asking its employees whether they are members of labor unions, there is no record of how many of the bank's employees are union members.

On the basis of the agreement on cross-border information and consultation of Deutsche Bank employees in the EU concluded on September 10, 1996, all employees in the EU are represented by the European Works Council. This adds up to around 53% of the Group's total workforce.

For further information on the bank's employees, see "Management Report: Employees" in the Annual Report 2022.

Share Ownership

For the share ownership of the Group's Management Board, see "Management Report: Compensation Report: Management Board Share Ownership" in the Annual Report 2022.

For the share ownership of the members of the Supervisory Board, see "Corporate Governance Statement/Corporate Governance Report: Reporting and Transparency: Directors' Share Ownership" in the Annual Report 2022.

For a description of the Group's employee share programs, please see Note 33 "Employee Benefits" to the consolidated financial statements.

Item 7: Major Shareholders and Related Party Transactions

Major Shareholders

On December 31, 2022, Deutsche Bank's issued share capital amounted to € 5,290,939,215.36 divided into 2,066,773,131 no par value ordinary registered shares.

On February 28, 2023, Deutsche Bank cancelled 26,530,172 of no par value ordinary registered shares owned by Deutsche Bank representing € 67,917,240.32. Following this cancellation, Deutsche Bank's issued share capital amounted to € 5,223,021,975.04 divided into 2,040,242,959 no par value ordinary registered shares.

On December 31, 2022, Deutsche Bank had 576,110 registered shareholders. 1,054,569,824 of the bank's shares were registered in the names of 565,465 shareholders resident in Germany, representing 51.04% of the share capital. 252,480,374 of Deutsche Bank's shares were registered in the names of 508 shareholders resident in the United States, representing 12.22% of the share capital.

The German Securities Trading Act (Wertpapierhandelsgesetz) requires investors in publicly-traded corporations whose investments reach certain thresholds to notify both the corporation and the BaFin of such change within four trading days. The minimum disclosure threshold is 3% of the corporation's issued voting share capital.

BlackRock, Inc., Wilmington, DE, has notified Deutsche Bank that as of December 31, 2020 it held 5.23% of the bank's shares. Deutsche Bank has received no further notification by BlackRock, Inc., Wilmington, DE, through February 23, 2023.

Paramount Service Holding Ltd. S.À.R.L., British Virgin Islands, has notified Deutsche Bank that as of January 25, 2023 it held 4.54% of the bank's shares. Deutsche Bank has received no further notification by Paramount Service Holding Ltd. S.À.R.L., British Virgin Islands, through February 23, 2023.

Douglas L. Braunstein (Hudson Executive Capital LP), has notified Deutsche Bank that as of November 20, 2020 he held 3.18% of the bank's shares. Deutsche Bank has received no further notification by Douglas L. Braunstein (Hudson Executive Capital LP), through February 23, 2023.

Supreme Universal Holdings Ltd., Cayman Islands, has notified Deutsche Bank that as of August 20, 2015 it held 3.05% of the bank's shares. Deutsche Bank has received no further notification by Supreme Universal Holdings Ltd., Cayman Islands, through February 23, 2023.

Over the last three years, Deutsche Bank has been notified of the following changes with regards to the minimum disclosure threshold.

	Disclosure date	% of outstanding shares held at disclosure date
Amundi S.A.	February 1, 2023	2.97
	October 19, 2022	3.07
	October 3, 2022	2.90
	September 27, 2022	3.10
	July 28, 2022	2.78
	June 22, 2022	3.08
	June 21, 2022	2.89
	June 20, 2022	3.07
	May 5, 2022	2.69
	April 27, 2022	3.08
BlackRock, Inc.	December 31, 2020	5.23
	December 16, 2020	4.98
	December 5, 2020	5.03
	December 3, 2020	4.99
	December 2, 2020	5.03
The Capital Group Companies, Inc.	April 13, 2022	0.01
	November 23, 2020	5.20
	March 31, 2020	3.74
	March 23, 2020	2.77
	January 31, 2020	3.10
Douglas L. Braunstein (Hudson Executive Capital LP)	November 20, 2020	3.18
Paramount Service Holding Ltd. S.À.R.L. ¹	January 25, 2023	4.54
Stephen A. Feinberg (Cerberus) ²	January 10, 2022	1.99

¹ From previously 3.05 % of Deutsche Bank shares as of August 20, 2015

² From previously 3.001 % of Deutsche Bank shares as of November 14, 2017

Deutsche Bank is neither directly nor indirectly owned nor controlled by any other corporation, by any government or by any other natural or legal person severally or jointly.

Pursuant to German law and our Articles of Association, to the extent that Deutsche Bank may have major shareholders at any time, Deutsche Bank may not give them different voting rights from any of its other shareholders.

Deutsche Bank is aware of no arrangements which may at a subsequent date result in a change in control of the company.

Related Party Transactions

Deutsche Bank has business relationships with a number of the companies in which the bank owns significant equity interests. Deutsche Bank also has business relationships with a number of companies where members of the bank's Management Board also hold positions on boards of directors. Deutsche Bank's business relationships with these companies cover many of the financial services the bank provides to their clients generally. For more detailed information, refer to Note 36 "Related Party Transactions" to the consolidated financial statements.

Deutsche Bank conducts its business with these companies on terms equivalent to those that would prevail if the bank did not have equity holdings in them or management members in common, and the bank has conducted business with these companies on that basis in 2022 and prior years. None of these transactions is or was material to the bank.

Among Deutsche Bank's business with related party companies in 2022, there have been and currently are loans, guarantees and commitments, which totaled € 124 million (including loans amounting to € 119 million) as of December 31, 2022, compared to € 123 million (including loans amounting to € 95 million) as of December 31, 2021.

All these credit exposures

- Were made in the ordinary course of business
- Were made on substantially the same terms, including interest rates and collateral, as those prevailing at the time for comparable transactions with other persons, and
- Did not involve more than the normal risk of collectability or present other unfavorable features compared to loans to nonrelated parties at their initiation

Related Party Impaired Loans

The Group did not have any impaired loans to related parties in 2022 and 2021.

Interests of Experts and Counsel

Not required because this document is filed as an Annual Report.

Item 8: Financial Information

Consolidated Statements and other financial information

Consolidated Financial Statements

The Financial Statements of this Annual Report on Form 20-F consist of the Consolidated Financial Statements including Notes 1 to 44 thereto, which are set forth as Part 2 of the Annual Report 2022, and, as described in Note 1 “Significant Accounting Policies and Critical Accounting Estimates” thereto under “Basis of accounting – IFRS 7 disclosures (including war in Ukraine and climate risk related disclosures)”, certain parts of the Management Report set forth as Part 1 of the Annual Report 2022. Such Consolidated Financial Statements have been audited by Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, as described in their “Report of Independent Registered Public Accounting Firm” included in the Annual Report 2022.

Legal Proceedings

General. Deutsche Bank and its subsidiaries operate in a legal and regulatory environment that exposes them to significant litigation risks. As a result, they are involved in litigation, arbitration and regulatory proceedings and investigations in Germany and in a number of jurisdictions outside Germany, including the United States. Please refer to Note 27 “Provisions” to the Consolidated Financial Statements for descriptions of certain significant legal proceedings. Additional legal proceedings that may have, or have had in the recent past, significant effects on the Group’s financial position or profitability are described below.

Bank Bill Swap Rate Claims. On August 16, 2016, a putative class action was filed in the U.S. District Court for the Southern District of New York against Deutsche Bank and other defendants, bringing claims based on alleged collusion and manipulation in connection with the Australian Bank Bill Swap Rate (“BBSW”) on behalf of persons and entities that engaged in U.S.-based transactions in BBSW-linked financial instruments from 2003 through the date on which the effects of the alleged unlawful conduct ceased. The complaint alleged that the defendants, among other things, engaged in money market transactions intended to influence the BBSW fixing, made false BBSW submissions, and used their control over BBSW rules to further the alleged misconduct. On April 29, 2022, Deutsche Bank and four other defendant banks entered into a settlement agreement with plaintiffs to resolve the dispute. The court granted final approval of the settlement on November 2, 2022.

FX derivatives products investigations and litigation. Deutsche Bank has received requests for information from certain regulators in connection with its internal investigation into the historical sales of certain FX derivatives products with a limited number of clients. Deutsche Bank is providing information to and otherwise cooperating with its regulators. Separately, on September 30, 2021, Deutsche Bank was served with a claim that was filed in the High Courts of England and Wales by four companies within the Palladium Hotels Group (“PHG”). PHG is claiming restitution or damages for alleged losses estimated at € 500 million in respect of FX derivatives trades entered into with Deutsche Bank between 2014 and 2019. They allege that Deutsche Bank made negligent misrepresentations, misstatements and/or breached a duty of care to PHG in relation to the trades. It is also alleged that one of the four PHG claimants lacked legal capacity to enter into some of the trades. On December 17, 2021, Deutsche Bank filed a defense disputing the claim on the following grounds: that PHG is a sophisticated investor with extensive experience of using derivatives, Deutsche Bank did not act as either an advisor or fiduciary to PHG, the trades reflected PHG’s own trading strategy and commercial objectives and were carried out with PHG’s full authorization, there were no misrepresentations, the relevant PHG claimant had capacity to enter into these trades, and that PHG well understood both the potential benefits and risks involved. On April 1, 2022, PHG filed their reply to Deutsche Bank’s defense. A case management conference/procedural hearing took place on November 14, 2022, where the Court made an order, timetabling the proceedings to trial, which is expected to commence in early 2025.

Investigations Into Certain Business Relationships. Deutsche Bank has reached settlements with the U.S. Department of Justice (DOJ) and the U.S. Securities and Exchange Commission (SEC), respectively, regarding their investigations of the Bank's compliance with the U.S. Foreign Corrupt Practices Act (FCPA) and other laws with respect to the Bank's engagement of finders and consultants. On January 8, 2021, Deutsche Bank entered into a deferred prosecution agreement (DPA) with the DOJ concerning its historical engagements of finders and consultants and, as part of its obligations in the DPA, agreed to pay approximately U.S. \$ 80 million in connection with this conduct. On the same day, Deutsche Bank also reached a settlement with the SEC to resolve its investigation into conduct regarding the bank's compliance with the FCPA with respect to the Bank's engagement of finders and consultants. The bank agreed to pay approximately U.S. \$43 million in this SEC settlement. On February 28, 2022, following a finding by the DOJ that the bank violated the 2021 DPA based on untimely reporting by the bank of certain allegations relating to environmental, social and governance (ESG)-related information at the bank's subsidiary DWS Group GmbH & Co. KGaA, the bank agreed with the DOJ to extend an existing monitorship and abide by the terms of a prior DPA until February 2023 to allow the monitor to certify to the bank's implementation of the related internal controls. The DOJ has reserved all rights to take further action regarding the 2021 DPA if it deems necessary.

KOSPI Index Unwind Matters. Following the decline of the Korea Composite Stock Price Index 200 (the "KOSPI 200") in the closing auction on November 11, 2010 by approximately 2.7 %, the Korean Financial Supervisory Service ("FSS") commenced an investigation and expressed concerns that the fall in the KOSPI 200 was attributable to a sale by Deutsche Bank of a basket of stocks, worth approximately € 1.6 billion, that was held as part of an index arbitrage position on the KOSPI 200. On February 23, 2011, the Korean Financial Services Commission, which oversees the work of the FSS, reviewed the FSS' findings and recommendations and resolved to take the following actions: (i) to file a criminal complaint to the Korean Prosecutor's Office for alleged market manipulation against five employees of Deutsche Bank group and Deutsche Bank's subsidiary Deutsche Securities Korea Co. (DSK) for vicarious corporate criminal liability; and (ii) to impose a suspension of six months, commencing April 1, 2011 and ending September 30, 2011, of DSK's business for proprietary trading of cash equities and listed derivatives and DMA (direct market access) cash equities trading, and the requirement that DSK suspend the employment of one named employee for six months. On August 19, 2011, the Korean Prosecutor's Office announced its decision to indict DSK and four employees of Deutsche Bank group on charges of spot/futures-linked market manipulation. The criminal trial commenced in January 2012. On January 25, 2016, the Seoul Central District Court rendered guilty verdicts against a DSK trader and DSK. A criminal fine of KRW 1.5 billion (less than € 2.0 million) was imposed on DSK. The Court also ordered forfeiture of the profits generated on the underlying trading activity. The Group disgorged the profits on the underlying trading activity in 2011. The criminal trial verdicts against both the DSK trader and against DSK were overturned on appeal in a decision rendered by the Seoul High Court on December 12, 2018. The Korean Prosecutor's Office has appealed the Seoul High Court decision.

In addition, a number of civil actions have been filed in Korean courts against Deutsche Bank and DSK by certain parties who allege they incurred losses as a consequence of the fall in the KOSPI 200 on November 11, 2010. First instance court decisions were rendered against the Bank and DSK in some of these cases starting in the fourth quarter of 2015. The one outstanding claim known to Deutsche Bank is for an amount of approximately € 50 million (at present exchange rates).

Monte Dei Paschi. In March 2013, Banca Monte dei Paschi di Siena ("MPS") initiated civil proceedings in Italy against Deutsche Bank alleging that Deutsche Bank assisted former MPS senior management in an accounting fraud on MPS, by undertaking repo transactions with MPS and "Santorini", a wholly owned special-purpose vehicle of MPS, which helped MPS defer losses on a previous transaction undertaken with Deutsche Bank. Subsequently, in July 2013, the Fondazione Monte dei Paschi di Siena ("FMPS"), MPS' largest shareholder, also commenced civil proceedings in Italy for damages based on substantially the same facts. In December 2013, Deutsche Bank reached an agreement with MPS to settle the civil proceedings and the transactions were unwound. The civil proceedings initiated by FMPS, in which damages of between € 220 million and € 381 million were claimed, were also settled in December 2018 upon payment by Deutsche Bank of € 17.5 million. FMPS's separate claim filed in July 2014 against FMPS's former administrators and a syndicate of 12 banks including Deutsche Bank S.p.A. for € 286 million has been settled and on July 26, 2022, the Court in Florence ended the proceedings. The impact of this settlement on Deutsche Bank was not material.

A criminal investigation was launched by the Siena Public Prosecutor into the transactions entered into by MPS with Deutsche Bank and certain unrelated transactions entered into by MPS with other parties. Such investigation was moved in summer 2014 from Siena to the Milan Public Prosecutors as a result of a change in the alleged charges being investigated. On February 16, 2016, the Milan Public Prosecutors issued a request of committal to trial against Deutsche Bank and six current and former employees. The committal process concluded with a hearing on October 1, 2016, during which the Milan court committed all defendants in the criminal proceedings to trial. Deutsche Bank's potential exposure was for administrative liability under Italian Legislative Decree n. 231/2001 and for civil vicarious liability as an employer of current and former Deutsche Bank employees who are being criminally prosecuted.

On November 8, 2019, the Milan court issued its verdicts, finding five former employees and one current employee of Deutsche Bank guilty and sentencing them to either 3 years and 6 months or 4 years and 8 months. Deutsche Bank was found liable under Italian Legislative Decree n. 231/2001 and the court ordered the seizure of alleged profits of € 64.9 million and a fine of € 3 million. The Court also found Deutsche Bank had civil vicarious liability for damages (to be quantified by the civil court) as an employer of the current and former employees who were convicted. The sentences and fines were not due until the conclusion of any appeal process. The final judgment was issued by the Court on May 13, 2020. Deutsche Bank and the six former or current employees filed an appeal to the Milan Court of Appeal on September 22, 2020. The Milan Court of Appeal heard the appeal between December 2, 2021 and March 31, 2022. On May 6, 2022, the Milan Court of Appeal delivered the second instance verdict by which they acquitted all the Deutsche Bank defendants from all the charges, found Deutsche Bank not liable under Italian Legislative Decree n. 231/2001, revoked the confiscation of € 64.9 million and the fine of € 3 million ordered against Deutsche Bank, and revoked the finding of civil vicarious liability for damages. The Milan Court of Appeal published its written reasons on October 3, 2022 and the Public Prosecutor filed an appeal against the Milan Court of Appeal verdicts before the Supreme Court on November 16, 2022. The hearing of the Supreme Court has not been scheduled yet.

On May 22, 2018, CONSOB, the authority responsible for regulating the Italian financial markets, issued fines of € 100,000 each against the six current and former employees of Deutsche Bank who are defendants in the criminal proceedings. The six individuals were also banned from performing management functions in Italy and for Italian based institutions for three to six months each. No separate fine or sanction was imposed on Deutsche Bank, but it is jointly and severally liable for the six current/former Deutsche Bank employees' fines. On June 14, 2018, Deutsche Bank and the six individuals filed an appeal in the Milan Court of Appeal challenging CONSOB's decision and one of the individuals sought a stay of enforcement of the fine against that individual. The stay was granted on July 21, 2018. On December 17, 2020, the Milan Court of Appeal allowed the appeals filed by Deutsche Bank and the six current and former employees and annulled the resolution sanctioning them. CONSOB filed an appeal to the Supreme Court against the decision on June 17, 2021. Deutsche Bank and the six individuals have opposed the appeal.

Precious Metals Investigations and Litigations. Deutsche Bank received inquiries from certain regulatory and law enforcement authorities, including requests for information and documents, pertaining to investigations of precious metals trading and related conduct. Deutsche Bank has cooperated with these investigations. On January 29, 2018, Deutsche Bank entered into a U.S.\$ 30 million settlement with the U.S. Commodity Futures Trading Commission (CFTC) concerning spoofing, and manipulation and attempted manipulation in precious metals futures and of stop loss orders. On January 8, 2021, Deutsche Bank entered into a deferred prosecution agreement with the DOJ concerning spoofing (and the FCPA) conduct. As part of its obligations in the deferred prosecution agreement, Deutsche Bank agreed to pay approximately U.S.\$ 8 million, of which approximately U.S.\$ 6 million would be credited by virtue of the aforementioned CFTC resolution.

Deutsche Bank was a defendant in two consolidated class action lawsuits pending in the U.S. District Court for the Southern District of New York. The suits allege violations of U.S. antitrust law, the U.S. Commodity Exchange Act and related state law arising out of the alleged manipulation of gold and silver prices through participation in the Gold and Silver Fixes. Deutsche Bank previously settled the silver action and has reached an agreement to settle the gold action for U.S.\$ 60 million, and the court granted final approval to the settlement on May 4, 2022.

Pre-Release ADRs. Deutsche Bank and certain affiliates have received inquiries from certain European regulatory, tax and law enforcement authorities, including requests for documents and information, with respect to American Depositary Receipts (ADRs), including ADRs that have been issued on a "pre-release" basis ("pre-release ADRs"). Deutsche Bank is cooperating with these inquiries.

Transfer of Lease Assets. In December 2017, a claim for damages was filed with the Regional Court Frankfurt am Main against Deutsche Bank AG in the amount of approximately € 155 million (excluding interest). In 2006, Deutsche Bank AG (indirectly, through a special-purpose vehicle) entered into transactions according to which the plaintiff transferred certain lease assets to the special-purpose vehicle against, among other things, receipt of a preference dividend. The plaintiff alleges that Deutsche Bank had entered into an agreement with it under which Deutsche Bank provided flawed contractual documentation as a result of which the German tax authorities have disallowed the plaintiff's expected tax savings. The Regional Court Frankfurt am Main fully dismissed the claim on July 26, 2019. The plaintiff has appealed this decision to the Higher Regional Court Frankfurt am Main. After its hearing on July 15, 2021, the Higher Regional Court Frankfurt am Main decided to reject the plaintiff's appeal in full. Leave to file a further appeal has not been granted, however, the plaintiff has filed a non-admission complaint with the German Federal. On July 28, 2022, the German Federal Court dismissed the plaintiff's non-admission complaint. The former judgment of the appellate court (Higher Regional Court Frankfurt am Main) in favor of Deutsche Bank AG is thus final.

Dividend Policy

For 2022, the Management Board intends to propose to the General Meeting a dividend of € 0.30 per share, after having paid a dividend of € 0.20 per share for 2021 and no dividend for 2020.

Deutsche Bank is committed to delivering sustainably growing cash dividends and, over time, returning to shareholders excess capital that is over and above what is required to support profitable growth and upcoming regulatory changes through share buybacks, subject to regulatory approval, shareholder authorization and meeting German corporate law requirements. To that end, subject to meeting the Group's strategic targets, the Management Board intends to grow the cash dividend per share by 50 % per annum in the next 3 years, starting from the € 0.20 per share paid for the financial year 2021. This would translate into approximately € 3.3 billion of cumulative dividend payments by 2025 with respect to financial years 2021-2024. In relation to the financial year 2024 the bank intends to achieve a total payout ratio of 50 % from a combination of dividends paid and share buybacks executed in 2025; and the bank intends to maintain a 50 % total payout ratio in subsequent years. In addition to the share buyback of € 0.3 billion already concluded in 2022, successfully executing the Group's financial and strategic plans through 2025 would therefore support the previously announced cumulative distributions to shareholders in the form of dividends paid or share buybacks executed of approximately € 8 billion in respect of financial years 2021-2025. Deutsche Bank's ambition to return capital to shareholders is further underpinned by the bank's aim to maintain a robust Common Equity Tier 1 (CET 1) capital ratio of approximately 13 %, i.e. to operate with a buffer of 200 basis points above the Maximum Distributable Amount (MDA) threshold the Group currently assumes to prevail over time.

However, Deutsche Bank cannot assure investors that it will pay dividends as it did in previous years, nor at any other level, or at all, in any future period. If Deutsche Bank AG is not profitable, it may not pay dividends at all. Furthermore, if Deutsche Bank AG fails to meet the regulatory capital adequacy requirements under CRR/CRD (including individually imposed capital requirements (so-called "Pillar 2" requirements) and the combined buffer requirement), it may be prohibited from making, and the ECB or the BaFin may suspend or limit, the payment of dividends. In addition, the ECB expects banks to meet "Pillar 2" guidance. If Deutsche Bank AG operates or expects to operate below "Pillar 2" guidance, the ECB will review the reasons why the Bank's capital level has fallen or is expected to fall and may take appropriate and proportionate measures in connection with such shortfall. Any such measures might have an impact on Deutsche Bank AG's willingness or ability to pay dividends. For further information on regulatory capital adequacy requirements and the powers of Deutsche Bank AG's regulators to suspend dividend payments, see "Item 4: Information on the Company – Regulation and Supervision – Capital Adequacy Requirements" and "– Investigative and Enforcement Powers."

Under German law, Deutsche Bank AG's dividends are based on the unconsolidated results of Deutsche Bank AG as prepared in accordance with the German Commercial Code (HGB). Deutsche Bank AG's Management Board, which prepares the annual financial statements of Deutsche Bank AG on an unconsolidated basis, and its Supervisory Board, which reviews them, first allocate part of Deutsche Bank AG's annual surplus (if any) to Deutsche Bank AG's statutory reserves and to any losses carried forward, in accordance with applicable legal requirements. They then allocate the remainder of any surplus to other revenue reserves (or retained earnings) and balance sheet profit. They may allocate up to one-half of this remainder to other revenue reserves, and must allocate at least one-half to balance sheet profit. A profit distribution from the balance sheet profit is only permitted to the extent that the balance sheet profit plus distributable earnings exceed potential dividend blocking items, which consist primarily of deferred tax assets, self-developed software and unrealized gains on plan assets, all net of respective deferred tax liabilities.

Deutsche Bank AG may then distribute a portion of or all of the amount of the balance sheet profit not subject to dividend blocking of Deutsche Bank AG if the annual General Meeting so resolves. The annual General Meeting may resolve a non-cash distribution instead of, or in addition to, a cash dividend. However, Deutsche Bank AG is not legally required to distribute its balance sheet profit to its shareholders to the extent that it has issued participatory rights (*Genussrechte*) or granted a silent participation (*stille Beteiligung*) that accord their holders the right to a portion of Deutsche Bank AG's distributable profit.

Deutsche Bank AG declares dividends by resolution of the annual General Meeting and pays them (if any) once a year. Dividends approved at a General Meeting are payable on the third business day after that meeting, unless a later date has been determined at that meeting or by the Articles of Association. In accordance with the German Stock Corporation Act, the record date for determining which holders of Deutsche Bank AG's ordinary shares are entitled to the payment of dividends, if any, or other distributions whether cash, stock or property, is the date of the General Meeting at which such dividends or other distributions are declared.

Significant Changes

Except as otherwise stated in this document, there have been no significant changes subsequent to December 31, 2022.

Item 9: The Offer and Listing

Offer and Listing Details and Markets

Deutsche Bank's share capital consists of ordinary shares issued in registered form without par value. Under German law, shares without par value are deemed to have a "nominal" value equal to the total amount of share capital divided by the number of shares. Deutsche Bank's shares have a nominal value in this sense of € 2.56 per share.

The principal trading market for Deutsche Bank's shares is the Frankfurt Stock Exchange, where it trades under the symbol DBK. Deutsche Bank's shares are also traded on the six other German stock exchanges (Berlin, Duesseldorf, Hamburg, Hanover, Munich and Stuttgart, where on each exchange it also trades under the symbol DBK), on the Eurex and the New York Stock Exchange, where it trades under the symbol DB.

Deutsche Bank maintains a share register in Frankfurt am Main and, for the purposes of trading our shares on the New York Stock Exchange, a share register in New York.

All shares on German stock exchanges trade in euros, and all shares on the New York Stock Exchange trade in U.S. dollars.

You should not rely on Deutsche Bank's past share performance as a guide to the bank's future share performance.

Plan of Distribution

Not required because this document is filed as an Annual Report.

Selling Shareholders

Not required because this document is filed as an Annual Report.

Dilution

Not required because this document is filed as an Annual Report.

Expenses of the Issue

Not required because this document is filed as an Annual Report.

Item 10: Additional Information

Share Capital

Not required because this document is filed as an Annual Report.

Memorandum and Articles of Association

The following is a summary of certain information relating to certain provisions of Deutsche Bank's Articles of Association, its share capital and German law. This summary is not complete and is qualified by reference to its Articles of Association and German law in effect at the date of this filing. Copies of the bank's Articles of Association are publicly available at the Commercial Register (*Handelsregister*) in Frankfurt am Main, and an English translation is filed as Exhibit 1.1 to this Annual Report.

Deutsche Bank's Business Objectives

Section 2 of the Articles of Association sets out the objectives of the Group's business:

- To transact all aspects of banking business
- To provide financial and other services and
- To promote international economic relations.

The bank's Articles of Association permit it to pursue these objectives directly or through subsidiaries and affiliated companies.

The Articles of Association also provide that, to the extent permitted by law, the Group may transact all business and take all steps that appear likely to promote the bank's business objectives. In particular, the bank may:

- Acquire and dispose of real estate
- Establish branches in Germany and abroad
- Acquire, administer and dispose of participations in other enterprises and
- Conclude intercompany agreements (*Unternehmensverträge*).

Supervisory Board and Management Board

For more information on the Supervisory Board and Management Board, see "Item 6: Directors, Senior Management and Employees."

Voting Rights and Shareholders' Meetings

Each of the bank's shares entitles its registered holder to one vote at Deutsche Bank's General Meeting. The Annual General Meeting takes place within the first eight months of the fiscal year. Pursuant to the Articles of Association, Deutsche Bank may hold the meeting in Frankfurt am Main, Düsseldorf or any other German city with over 250,000 inhabitants. Unless a shorter period is permitted by law, the Group must give the notice convening the General Meeting at least 30 days before the last day on which shareholders can register their attendance of the General Meeting (which is the sixth day immediately preceding that General Meeting). Shorter periods apply if the General Meeting is called to adopt a resolution on a capital increase in the context of early intervention measures pursuant to the Act on the Recovery and Resolution of Institutions and Financial Groups (*Gesetz zur Sanierung und Abwicklung von Instituten und Finanzgruppen*). The bank is required to include details regarding the shareholder attendance registration process and the issuance of admission cards in its invitation to the General Meeting.

The Management Board or the Supervisory Board may also call an extraordinary General Meeting. Shareholders holding in the aggregate at least 5 % of the nominal value of Deutsche Bank's share capital may also request that such a meeting be called.

According to the Articles of Association, Deutsche Bank's shares are issued in the form of registered shares. For purposes of registration in the share register, all shareholders are required to notify the bank of the number of shares they hold and, in the case of natural persons, of their name, address and date of birth and, in the case of legal persons, of their registered name, business address and registered domicile, and in both cases should add an electronic address. Both being registered in the bank's share register and the timely registration for attendance of the General Meeting constitute prerequisite conditions for any shareholder's attendance and exercise of voting rights at the General Meeting. Shareholders may register their attendance of a General Meeting with the Management Board (or as otherwise designated in the invitation) by written notice or electronically, no later than the sixth day immediately preceding the date of that General Meeting. Any shareholders who have failed to comply with certain notification requirements summarized under "Notification Requirements" below are precluded from exercising any rights attached to their shares, including voting rights.

Under German law, upon the bank's request a registered shareholder must inform the Group whether that shareholder owns the shares registered in its name or whether that shareholder holds the shares for any other person as a nominee shareholder. Both the nominee shareholder and the person for whom the shares are held have an obligation to provide the same personal data as required for registration in the share register with respect to the person for whom the shares are held.

Shareholders may appoint proxies to represent them at General Meetings. As a matter of German law, a proxy relating to voting rights granted by shares may be revoked at any time.

As a foreign private issuer, Deutsche Bank is not required to file a proxy statement under U.S. securities law. The proxy voting process for the bank's shareholders in the United States is substantially similar to the process for publicly held companies incorporated in the United States.

The Annual General Meeting normally adopts resolutions on the following matters:

- Appropriation of distributable balance sheet profits (*Bilanzgewinn*) from the preceding fiscal year;
- Formal ratification of the acts (*Entlastung*) of the members of the Management Board and the members of the Supervisory Board in the preceding fiscal year; and
- Appointment of independent auditors for the current fiscal year.

A simple majority of votes cast is generally sufficient to approve a measure, except in cases where a greater majority is otherwise required by the bank's Articles of Association or by law. Under the German Stock Corporation Act and the German Transformation Act (*Umwandlungsgesetz*), certain resolutions of fundamental importance require a majority of at least 75 % of the share capital represented at the General Meeting adopting the resolution, in addition to a majority of the votes cast. Such resolutions include the following matters, among others:

- Amendments to the Articles of Association changing the Group's business objectives
- Capital increases that exclude subscription rights
- Capital reductions
- Creation of authorized or conditional capital
- Deutsche Bank's dissolution
- "Transformations" under the German Transformation Act such as mergers, spin-offs and changes in the bank's legal form
- Transfer of all the bank's assets
- Integration of another company and
- Intercompany agreements (in particular, domination and profit-transfer agreements).

Under certain circumstances, such as when a resolution violates the Articles of Association or the German Stock Corporation Act, shareholders may file a shareholder action with the appropriate Regional Court (*Landgericht*) in Germany to set aside resolutions adopted at the General Meeting.

Under German law, the rights of shareholders as a group can be changed by amendment of the company's articles of association. Any amendment of the Articles of Association requires a resolution of the General Meeting. The authority to amend the Articles of Association, insofar as such amendments merely relate to the wording, such as changes of the share capital as a result of the issuance of shares from authorized capital, has been assigned to the Supervisory Board by the Articles of Association. Pursuant to the Articles of Association, the resolutions of the General Meeting are taken by a simple majority of votes and, insofar as a majority of capital stock is required, by a simple majority of capital stock, except where law or the Articles of Association determine otherwise. The rights of individual shareholders can only be changed with their consent. Amendments to the Articles of Association become effective upon their registration in the Commercial Register.

Share Register

Deutsche Bank maintains a share register with Link Market Services GmbH and its New York transfer agent, pursuant to an agency agreement between Deutsche Bank and Link Market Services GmbH and a sub-agency agreement between Link Market Services GmbH and the New York transfer agent.

Deutsche Bank's share register will be open for inspection by shareholders during normal business hours at its offices at Taunusanlage 12, 60325 Frankfurt am Main, Germany. The share register generally contains each shareholder's surname, first name, date of birth, address, as the case may be, electronic address and the number or the quantity of the shares held. Shareholders may prevent its personal information from appearing in the share register by holding its securities through a bank or custodian. Although the shareholder would remain the beneficial owner of the securities, only the bank's or custodian's name would appear in the share register.

Dividend Rights

For a summary of Deutsche Bank's dividend policy and legal basis for dividends under German law, see "Item 8: Financial Information – Dividend Policy."

Increases in Share Capital

German law and its Articles of Association permit Deutsche Bank to increase its share capital in any of three ways:

- Resolution by the General Meeting authorizing the issuance of new shares.
- Resolution by the General Meeting authorizing the Management Board, subject to the approval of the Supervisory Board, to issue new shares up to a specified amount (no more than 50 % of existing share capital) within a specified period, which may not exceed five years. This is referred to as authorized capital (*genehmigtes Kapital*).
- Resolution by the General Meeting authorizing the issuance of new shares up to a specified amount (no more than 50 % of existing share capital) for specific purposes, such as for employee stock options, for use as consideration in a merger or to issue to holders of convertible bonds or other convertible securities. This is referred to as conditional capital (*bedingtes Kapital*).

The issuance of new ordinary shares by resolution of the General Meeting requires the simple majority of the votes cast and of the share capital represented at the General Meeting. Should the resolution of the General Meeting provide for the exclusion of shareholders' preemptive rights in full or in part, the simple majority of the votes cast and a majority of at least 75 % of the share capital represented at the General Meeting are required. Similarly, resolutions of the General Meeting concerning the creation of authorized or conditional capital require the simple majority of the votes cast and a majority of at least 75 % of the share capital represented at the General Meeting.

Liquidation Rights

The German Stock Corporation Act requires that if the bank is liquidated, any liquidation proceeds remaining after the payment of all the bank's liabilities will be distributed to the bank's shareholders in proportion to their shareholdings.

Preemptive Rights

In principle, holders of Deutsche Bank shares have preemptive rights allowing them to subscribe any shares, bonds convertible into, or attached warrants to subscribe for, the bank's shares or participatory certificates it issues. Such preemptive rights exist in proportion to the number of shares currently held by the shareholder. Preemptive rights of shareholders may be excluded with respect to any capital increase, however, as part of the resolution by the General Meeting on such capital increase. Such a resolution by the General Meeting on a capital increase that excludes the shareholders' preemptive rights with respect thereto requires both a majority of the votes cast and a majority of at least 75 % of the share capital represented at the General Meeting. A resolution to exclude preemptive rights requires that the proposed exclusion is expressly disclosed in the agenda to the General Meeting and that the Management Board presents the reasons for the exclusion to the shareholders in a written report. Under the German Stock Corporation Act, preemptive rights may in particular be excluded with respect to capital increases not exceeding 10 % of the existing share capital with an issue price payable in cash not significantly below the stock exchange price at the time of issuance. In addition, shareholders may, in a resolution by the General Meeting on authorized capital, authorize the Management Board to exclude the preemptive rights with respect to newly issued shares from authorized capital in specific circumstances set forth in the resolution.

Shareholders are generally permitted to transfer their preemptive rights. Preemptive rights may be traded on one or more German stock exchanges for a limited number of days prior to the final day the preemptive rights can be exercised.

Notices and Reports

Deutsche Bank publishes notices pertaining to its shares and the General Meeting in the German Federal Gazette (*Bundesanzeiger*).

The bank sends its New York transfer agent, through publication or otherwise, a copy of each of its notices pertaining to any General Meeting, any adjourned General Meeting or its actions with respect to any cash or other distributions or the offering of any rights. The Group provides such notices in the form given or to be given to its shareholders. The bank's New York transfer agent is requested to arrange for the mailing of such notices to all shareholders registered in the New York registry.

Deutsche Bank will make all notices it sends to shareholders available at its principal office for inspection by shareholders.

Charges of Transfer Agents

Deutsche Bank pays Link Market Services GmbH and its New York transfer agent customary fees for their services as transfer agents and registrars. The Group's shareholders will not be required to pay Link Market Services GmbH or its New York transfer agent any fees or charges in connection with its transfers of shares in the share register. The bank's shareholders will also not be required to pay any fees in connection with the conversion of dividends from euros to U.S. dollars.

Liability of Transfer Agents

Neither Link Market Services GmbH nor the bank's New York transfer agent will be liable to shareholders if prevented or delayed by law, or any circumstances beyond its control, from performing its obligations as transfer agents and registrars.

Notification Requirements

Disclosure of Interests in a Listed Stock Corporation

Disclosure Obligations under the German Securities Trading Act

Deutsche Bank AG, as a listed company, and its shareholders are subject to the shareholding disclosure obligations under the German Securities Trading Act (*Wertpapierhandelsgesetz*). Pursuant to the German Securities Trading Act, any shareholder whose voting interest in a listed company like Deutsche Bank AG, through acquisition, sale or by other means, reaches, exceeds or falls below a 3 %, 5 %, 10 %, 15 %, 20 %, 25 %, 30 %, 50 % or 75 % threshold must notify the bank and the BaFin of its current aggregate voting interest in writing and without undue delay, but at the latest within four trading days. In connection with this requirement, the German Securities Trading Act contains various provisions regarding the attribution of voting rights to the person who actually controls the voting rights attached to the shares.

Furthermore, the voting rights attached to a third party's shares are attributed to a shareholder if the shareholder coordinates its conduct concerning the listed company with the third party (so-called "acting in concert") either through an agreement or other means. Acting in concert is deemed to exist if the parties coordinate their voting at the listed company's general meeting or, outside the general meeting, coordinate their actions with the goal of significantly and permanently modifying the listed company's corporate strategy. Each party's voting rights are attributed to each of the other parties acting in concert.

Shareholders failing to comply with their notification obligations are prevented from exercising any rights attached to their shares (including voting rights and the right to receive dividends) until they have complied with the notification requirements. If the failure to comply with the notification obligations specifically relates to the size of the voting interest in Deutsche Bank AG and is the result of willful or grossly negligent conduct, the suspension of shareholder rights is – subject to certain exceptions in case of an incorrect notification deviating no more than 10 % from the actual percentage of voting rights – extended by a six-month period commencing upon the submission of the required notification.

Except for the 3 % threshold, similar notification obligations exist for reaching, exceeding or falling below the thresholds described above when a person holds, directly or indirectly, certain instruments other than shares. This applies to instruments which grant upon maturity an unconditional right to acquire existing voting shares of Deutsche Bank AG, a discretionary right to acquire such shares, as well as to instruments that refer to such shares and have an economic effect similar to that of the aforementioned instruments, irrespective of whether such instruments are physically or cash-settled. These instruments include, for example, transferable securities, options, futures contracts and swaps. Voting rights to be attributed to a person based on any such instrument will generally be aggregated with the person's other voting rights deriving from shares or other instruments.

Notice must be given without undue delay, but within four trading days at the latest. The notice period commences as soon as the person obliged to notify knows, or, under the circumstances should know, that his or her voting rights reach, exceed or fall below any of the abovementioned relevant thresholds, but in any event no later than two trading days after reaching, exceeding or falling below the threshold. Only in case that the voting rights reach, exceed or fall below any of the thresholds as a result of an event affecting all voting rights, the notice period might commence at a later stage. Deutsche Bank AG must publish the foregoing notifications without undue delay, but no later than within three trading days after their receipt, and report such publication to the BaFin. Furthermore, Deutsche Bank AG must publish a notification in case of any increase or decrease of the total number of voting rights without undue delay, but within two trading days at the latest, and such notification must be reported to the BaFin and forwarded to the German Company Register (*Unternehmensregister*). An exception applies where the increase of the total number of voting rights is due to the issue of new shares from conditional capital. In this case, Deutsche Bank AG must publish the increase at the end of the month in which it occurred. However, such increase must also be notified without undue delay, but within two trading days at the latest, where any other increase or decrease of the total number of voting rights triggers the aforementioned notification requirement.

Non-compliance with the disclosure requirements regarding shareholdings and holdings of other instruments may result in a significant fine imposed by the BaFin. In addition, the BaFin publishes, on its website, sanctions imposed and measures taken indicating the person or entity responsible and the nature of the breach (so-called “naming and shaming”).

Shareholders whose voting rights reach or exceed thresholds of 10 % of the voting rights in a listed company, or higher thresholds, are obliged to inform the company within 20 trading days of the purpose of their investment and the origin of the funds used for such investment, unless the articles of association of the listed company provide otherwise. The bank's Articles of Association do not contain such a provision.

Disclosure Obligations under the German Securities Acquisition and Takeover Act

Pursuant to the German Securities Acquisition and Takeover Act (*Wertpapiererwerbs- und Übernahmegesetz*), any person whose voting interest reaches or exceeds 30 % of the voting shares of a listed stock corporation must, within seven calendar days, publish this fact (including the percentage of its voting rights) on the Internet and by means of an electronically operated financial information dissemination system. In addition, the person must subsequently make a mandatory public tender offer within four weeks to all shareholders of the listed company unless an exemption has been granted. The German Securities Acquisition and Takeover Act contains a number of provisions intended to ensure that shareholdings are attributed to those persons who actually control the voting rights attached to the shares. The provisions regarding coordinated conduct as part of the German Securities Acquisition and Takeover Act (so-called “acting in concert”) and the rules on the attribution of voting rights attached to shares of third parties are the same as the statutory securities trading provisions described above under “Disclosure Obligations under the German Securities Trading Act” except with respect to voting rights of shares underlying instruments whose holders are vested with the right to unilaterally acquire existing voting shares of the listed company or voting rights which may be acquired on the basis of instruments with similar economic effect. If a shareholder fails to provide notice on reaching or exceeding the 30 % threshold, or fails to make a public tender offer, the shareholder will be precluded from exercising any rights associated with its shares (including voting and dividend rights) until it has complied with the requirements under the German Securities Acquisition and Takeover Act. In addition, non-compliance with the disclosure requirement may result in a fine.

Disclosure of Participations in a Credit Institution

The German Banking Act (*Kreditwesengesetz*) requires any person intending to acquire, alone or acting in concert with another person, directly or indirectly, a qualifying holding (*bedeutende Beteiligung*) in a credit or financial services institution to notify the BaFin and the Bundesbank without undue delay and in writing of the intended acquisition. A qualifying holding is a direct or indirect holding in an undertaking which represents 10 % or more of the capital or voting rights or which makes it possible to exercise a significant influence over the management of such undertaking. The required notice must contain information demonstrating, among other things, the reliability of the person or, in the case of a corporation or other legal entity, the reliability of its directors and officers.

A person holding a qualifying holding shall also notify the BaFin and the Bundesbank without undue delay and in writing if he intends to increase the amount of the qualifying holding up to or beyond the thresholds of 20 %, 30 % or 50 % of the voting rights or capital or in such way that the institution comes under such person's control or if such person intends to reduce the participation below 10 % or below one of the other thresholds described above.

The BaFin will have to confirm the receipt of a complete notification within two working days in writing to the proposed acquirer. Within a period of 60 working days from the BaFin's written confirmation that a complete notification has been received (assessment period), the BaFin will review and, in accordance with Council Regulation (EU) No 1024/2013 of October 15, 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions, forward the notification and a proposal for a decision whether or not to object to the acquisition to the ECB. The ECB will decide whether or not to object to the acquisition on the basis of the applicable assessment criteria. Within the assessment period the ECB may prohibit the intended acquisition in particular if there appears to be reason to assume that the acquirer or its directors and officers are not reliable or that the acquirer is not financially sound, that the participation would impair the effective supervision of the relevant credit institution, that a prospective managing director (*Geschäftsleiter*) is not reliable or not qualified, that money laundering or financing of terrorism has occurred or been attempted in connection with the intended acquisition, or that there would be an increased risk of such illegal acts as a result of the intended acquisition. During the assessment period the BaFin may request further information necessary for its or the ECB's assessment. Generally, such a request delays the expiration of the assessment period by up to 30 business days. If the information submitted is incomplete or incorrect the ECB may prohibit the intended acquisition.

If a person acquires a qualifying holding despite such prohibition or without making the required notification, the competent authority may prohibit the person from exercising the voting rights attached to the shares. In addition, non-compliance with the disclosure requirement may result in the imposition of a fine in accordance with statutory provisions. Moreover, the competent authority may order that any disposition of the shares requires its approval and may ultimately appoint a trustee to exercise the voting rights attached to the shares or to sell the shares to the extent they constitute a qualifying holding.

Disclosure of Participations in Regulated Subsidiaries

The acquisition of shares in Deutsche Bank AG may trigger an obligation to notify certain national competent authorities in charge of the supervision of regulated subsidiaries of Deutsche Bank AG, provided that such acquisition of shares is treated as an indirect acquisition of a stake in the relevant subsidiaries and the applicable threshold under local law is reached or exceeded. This applies in particular to subsidiaries in a member state of the European Economic Area for which the CRR sets forth a threshold of 10 %. Other jurisdictions may apply lower thresholds. For example, because the bank controls Deutsche Bank (Malaysia) Berhad, Section 87(1) of the Malaysian Financial Services Act 2013 requires approval of Bank Negara Malaysia (the Malaysian central bank) of any acquisition of 5 % or more of the bank's ordinary shares. Also, because Deutsche Bank controls bank subsidiaries in the United States, including Deutsche Bank Trust Company Americas, and has securities registered under the U.S. Securities Exchange Act of 1934, the U.S. Change in Bank Control Act requires that any person or any persons acting in concert may acquire control of 10 % or more of the bank's ordinary shares only subject to the approval of the Federal Reserve Board and other U.S. regulators.

Review of Acquisition of 10 % of voting rights or more by the German Federal Ministry of Economic Affairs and Climate Action

Pursuant to the German Foreign Trade Act (*Außenwirtschaftsgesetz*) and the German Foreign Trade Regulation (*Außenwirtschaftsverordnung*), acquisitions may be reviewed by the German Federal Ministry of Economic Affairs and Climate Action (the "Ministry") where the initial direct or indirect acquisition of voting rights in a German company by investors from outside the European Union (EU) and the European Free Trade Association (Iceland, Lichtenstein, Norway and Switzerland) exceed 10 %, 20 % or 25 %, or where voting rights in a German company by investors outside the EU or European Free Trade Association exceed 20 %, 25 %, 40 %, 50 % or 75 % through direct or indirect subsequent acquisitions. Both the thresholds for the applicable initial voting rights (10 %, 20 % or 25 %) and whether a filing obligation exists or not, depend on the industry sector the target company is active in. The Ministry must be notified in writing regarding the conclusion of a contract where the direct or indirect acquisition by an investor from outside the European Union and the European Free Trade Association is 10 % or 20 % (or where the direct or indirect subsequent acquisitions exceeding 20 %, 25 %, 40 %, 50 % or 75 % of the voting rights) of the voting rights in a German company which operates certain critical infrastructure (including inter alia certain services in the financial sector) or operates in other certain sensitive sectors (including inter alia certain technologies, IT, telecommunication, healthcare or the media). The Ministry must also be notified in writing regarding the conclusion of a contract where there is a direct or indirect acquisition by an investor from outside Germany of 10 % or more of the voting rights in a German company operating in the defense or cryptology sectors (or where the direct or indirect subsequent acquisitions exceeds 20 %, 25 %, 40 %, 50 % or 75 % of the voting rights). If Deutsche Bank is considered to be a company which operates in any such critical infrastructure or sensitive sector, the Ministry would need to be notified of an acquisition of voting rights in Deutsche Bank that meets the abovementioned thresholds. Pending clearance by the Ministry, an acquisition subject to this notification requirement must not be consummated without clearance and its implementation would be legally void.

Consummating such an acquisition without clearance may also result in administrative fines of up to € 500,000 (acting negligently) or up to five years imprisonment or monetary fines (acting willfully). The acquirer may seek voluntary pre-clearance of a proposed acquisition from the Ministry that is not subject to a mandatory filing. The Ministry may impose conditions on the acquisition, prohibit the acquisition, or require that it is unwound, if the Ministry determines that the acquisition will likely affect the public order or public security of Germany or another EU member state, or in relation to certain projects or programs of interest for the European Union pursuant to the "EU-Screening regulation, or likely affects the essential security interests of Germany. The Ministry's decision to review an acquisition must be made within two months following the Ministry's knowledge of the conclusion of the acquisition contract, of the publication of the decision to launch a take-over bid or of the publication of the acquisition of control. The review must be completed within four months following receipt of the complete set of acquisition documents and any additional information requested by the Ministry. The Ministry can extend its review period up to an additional four months. A review is precluded if more than five years have passed since the acquisition.

EU Short Selling Regulation (ban on naked short selling)

Regulation (EU) No 236/2012 of the European Parliament and of the Council of March 14, 2012 on short selling and certain aspects of credit default swaps (the "EU Short Selling Regulation") came into force on November 1, 2012. The EU Short Selling Regulation, the regulations adopted by the EU Commission implementing it, and the German act implementing the EU Short Selling Regulation replace the previously applicable German federal provisions governing the ban on naked short selling of shares and certain debt securities. (Short sales are sales of securities that the seller does not own, with the intention of buying back an identical security at a later point in time in order to be able to deliver the security. A short sale is "naked" when the seller has not borrowed the securities at the time of the short sale, or ensured they can be borrowed or obtained under a similar arrangement.) Under the EU Short Selling Regulation, except for certain exemptions, naked short sales of listed shares are not permitted. Short sales of listed shares that are covered by borrowing or similar arrangements are subject to the following transparency requirements. Significant net short positions in shares must be reported to the BaFin and, if a certain threshold is exceeded, they must also be publicly disclosed. Net short positions are calculated by netting the long and short positions held by a natural or legal person in the issued capital of the company concerned. The details are set forth in the EU Short Selling Regulation and the regulations adopted by the EU Commission implementing it. In certain situations described in greater detail in the EU Short Selling Regulation, the BaFin is permitted to limit short selling and comparable transactions.

Disclosure of Transactions of Managers

Art. 19 of Regulation (EU) No 596/2014 of the European Parliament and of the Council of April 16, 2014 on market abuse (the “EU Market Abuse Regulation”) requires persons with management responsibilities (“Managers”) in a listed company like Deutsche Bank AG to notify the company and the BaFin of their own transactions in shares or debt instruments of the company or financial instruments based thereon, in particular derivatives. Such notifications must be made promptly and no later than three business days after the date of the transaction. The notification obligation also applies to persons who are closely associated with a Manager. The obligation does not apply if the aggregate annual transactions by a Manager or persons with whom he or she is closely associated do not, individually, exceed a certain threshold amount through the end of a calendar year. The BaFin has made use of its authority to increase the threshold of € 5,000 set forth in the EU Market Abuse Regulation to the maximum possible amount of € 20,000.

Deutsche Bank AG is required to promptly publish any notification received but in any case no later than two business days after receipt of such notification. The publication must be made in a manner which enables fast access to this information on a non-discriminatory basis in accordance with the implementing standards published by the European Securities and Markets Authority. Furthermore, Deutsche Bank AG must without undue delay notify the BaFin and forward the notification to the Company Register (Unternehmensregister). For the purposes of the EU Market Abuse Regulation, the following persons are deemed to be a Manager: members of management, administrative or supervisory bodies of Deutsche Bank AG as well as senior executives who are not such members but who have regular access to inside information relating directly or indirectly to the Company and who have power to take managerial decisions affecting the future developments and business prospects of the Company. The following persons are deemed to be closely associated with a Manager: spouses, registered civil partners (*eingetragene Lebenspartner*), dependent children and other relatives who at the time of the transaction requiring notification have lived in the same household with the Manager for at least one year. Legal entities for which the aforementioned persons have management responsibilities are also subject to the notification requirement. The aforementioned provisions also apply to legal entities, companies and institutions directly or indirectly controlled by a Manager or by a person closely associated with a Manager, which have been founded to the benefit of such a person, or whose economic interests correspond to a considerable extent to those of such a person. Non-compliance with the notification requirements may result in a fine.

Material Contracts

In the usual course of the bank’s business, Deutsche Bank enters into numerous contracts with various other entities. The bank has not, however, entered into any material contracts outside the ordinary course of its business within the past two years.

Exchange Controls

As in other member states of the European Union, regulations issued by the competent European Union authorities to comply with United Nations resolutions have caused freeze orders on assets of certain legal and natural persons designated in such regulations. In addition, the European Union maintained a wide range of autonomous economic and financial sanctions on Iran. While all nuclear-related economic and financial EU sanctions against Iran were repealed on January 16, 2016, some restrictions remain in force.

Moreover, in response to the war in Ukraine the European Union, the United States, the United Kingdom and others imposed broad-based sanctions against Russia.

With some exceptions, corporations or individuals residing in Germany are required to report to the Bundesbank any payment received from, or made to or for the account of, a nonresident corporation or individual that exceeds € 12,500 (or the equivalent in a foreign currency). This reporting requirement is for statistical purposes.

Subject to the above-mentioned exceptions, there are currently no German laws, decrees or regulations that would prevent the transfer of capital or remittance of dividends or other payments to shareholders who are not residents or citizens of Germany.

There are also no restrictions under German law or the bank's Articles of Association concerning the right of nonresident or foreign shareholders to hold the bank's shares or to exercise any applicable voting rights. Where the investment reaches or exceeds certain thresholds, however, certain reporting obligations apply and the investment may become subject to review by the BaFin, the European Central Bank and other competent authorities. For more information see "Item 10: Additional Information – Notification Requirements".

Taxation

The following is a general summary of material German and United States federal income tax consequences of the ownership and disposition of shares for a resident of the United States for purposes of the income tax convention between the United States and Germany (the "Treaty") who is fully eligible for benefits under the Treaty. A U.S. resident will generally be entitled to Treaty benefits if it is:

- The beneficial owner of shares (and of the dividends paid with respect to the shares)
- An individual resident of the United States, a U.S. corporation, or a partnership, estate or trust to the extent its income is subject to taxation in the United States in its hands or in the hands of its partners or beneficiaries
- Not also a resident of Germany for German tax purposes and
- Not subject to "anti-treaty shopping" articles under German domestic law or the Treaty that apply in limited circumstances.

The Treaty benefits discussed below generally are not available to shareholders who hold shares in connection with the conduct of business through a permanent establishment in Germany. The summary does not discuss the treatment of those shareholders.

The summary does not purport to be a comprehensive description of all of the tax considerations that may be relevant to any particular shareholder, including tax considerations that arise from rules of general application or that are generally assumed to be known by shareholders. In particular, the summary deals only with shareholders that will hold shares as capital assets and does not address the tax treatment of shareholders that are subject to special rules, such as fiduciaries of pension (e.g. U.S. pension funds), profit-sharing or other employee benefit plans, banks, insurance companies, dealers in securities or currencies, persons that hold shares as a position in a straddle, conversion transaction, synthetic security or other integrated financial transaction, persons that elect mark-to-market treatment, persons that own, directly or indirectly, 10% or more of our stock, measured by vote or value, persons that hold shares through a partnership or hybrid entity and persons whose "functional currency" is not the U.S. dollar. The summary is based on German and U.S. laws, treaties and regulatory interpretations, including in the United States current and proposed U.S. Treasury regulations as of the date hereof, all of which are subject to change (possibly with retroactive effect).

Shareholders should consult their own advisors regarding the tax consequences of the ownership and disposition of shares in light of their particular circumstances, as well as the effect of any state, local or other national laws.

Taxation of Dividends

In general, dividends that Deutsche Bank pays are subject to German withholding tax at an aggregate rate of 26.375% (consisting of a 25% withholding tax and a 1.375% surcharge). Under the Treaty, a U.S. resident will be entitled to receive a refund from the German tax authorities of 11.375 in respect of a declared dividend of 100. For example, for a declared dividend of 100, a U.S. resident initially will receive 73.625 and may claim a refund from the German tax authorities of 11.375 and, therefore, receive a total cash payment of 85 (i.e., 85% of the declared dividend). According to the German Investment Tax Act dividends received by an investment fund within the meaning of the German Investment Tax Act are generally subject to 15% German withholding tax equal to the Treaty tax rate. U.S. residents who are entitled to a refund of more than 11.375% (e.g. U.S. pension funds) have to fulfil further requirements according to para. 50j German Income Tax Act, in particular certain holding requirements.

For U.S. tax purposes, a U.S. resident will be deemed to have received total dividends of 100. The gross amount of dividends that a U.S. resident receives (which includes amounts withheld in respect of German withholding tax) generally will be subject to U.S. federal income taxation as foreign source dividend income, and will not be eligible for the dividends received deduction generally allowed to U.S. corporations. German withholding tax at the 15% rate provided under the Treaty will be treated as a foreign income tax that, subject to generally applicable limitations under U.S. tax law, is eligible for credit against a U.S. resident's U.S. federal income tax liability or, at its election, may be deducted in computing taxable income. Thus, for a declared dividend of 100, a U.S. resident will be deemed to have paid German taxes of 15. A U.S. resident cannot claim credits for German taxes that would have been refunded to it if it had filed a claim for refund. Foreign tax credits will not be allowed for withholding taxes imposed in respect of certain short-term or hedged positions. The creditability of foreign withholding taxes may be limited in certain situations, including where the burden of foreign taxes is separated inappropriately from the related foreign income.

Subject to certain exceptions for short-term and hedged positions, "qualified dividends" received by certain non-corporate U.S. shareholders will generally be subject to taxation in the United States at a lower rate than other ordinary income. Dividends received will be qualified dividends if Deutsche Bank (i) is eligible for the benefits of a comprehensive income tax treaty with the United States that the U.S. Internal Revenue Service ("IRS") has approved for purposes of the qualified dividend rules and (ii) was not, in the year prior to the year in which the dividend was paid, and is not, in the year in which the dividend is paid, a passive foreign investment company ("PFIC"). The Treaty has been approved for purposes of the qualified dividend rules, and Deutsche Bank believes it qualifies for benefits under the Treaty. The determination of whether the bank is a PFIC must be made annually and is dependent on the particular facts and circumstances at the time. It requires an analysis of the bank's income and valuation of its assets, including goodwill and other intangible assets. Based on the audited financial statements and relevant market and shareholder data, the bank believes that it was not a PFIC for U.S. federal income tax purposes with respect to its taxable years ended December 31, 2021 or December 31, 2022. In addition, based on the Group's current expectations regarding the value and nature of its assets, the sources and nature of its income, and relevant market and shareholder data, the bank does not currently anticipate becoming a PFIC for its taxable year ending December 31, 2023, or for the foreseeable future. However, the PFIC rules are complex and their application to financial services companies is unclear. Each U.S. shareholder should consult its own tax advisor regarding the potential applicability of the PFIC regime to Deutsche Bank and its implications for their particular circumstances.

If a U.S. resident receives a dividend paid in euros, it will recognize income in a U.S. dollar amount calculated by reference to the exchange rate in effect on the date of receipt, regardless of whether the payment is in fact converted into U.S. dollars. If dividends are converted into U.S. dollars on the date of receipt, a U.S. resident generally should not be required to recognize foreign currency gain or loss in respect of the dividend income but may be required to recognize foreign currency gain or loss on the receipt of a refund in respect of German withholding tax to the extent the U.S. dollar value of the refund differs from the U.S. dollar equivalent of that amount on the date of receipt of the underlying dividend.

Refund Procedures

To claim a refund, a U.S. resident must submit, within four years from the end of the calendar year in which the dividend is received, a claim for refund to the German tax authorities. The claim for refund must be accompanied by a withholding tax certificate (Kapitalertragsteuerbescheinigung) on an officially prescribed form and issued by the institution that withheld the tax.

According to para. 50c (5) German Income Tax Act, claims for refunds have to be transmitted via the officially specified interface according to the officially prescribed data set. The German claim for refund forms can be submitted to the Bundeszentralamt für Steuern via the online portal of the Bundeszentralamt für Steuern (so called “BOP”): <https://www.elster.de/bportal/start>. Every claimant needs a certificate file to login into the BOP. A special form is available in cases where para. 50j German Income Tax Act is applicable. A U.S. resident must also submit to the German tax authorities a certification (on IRS Form 6166) with respect to its last filed U.S. federal income tax return. Requests for IRS Form 6166 are made on IRS Form 8802, which requires payment of a user fee. IRS Form 8802 and its instructions can be obtained from the IRS website at www.irs.gov. Instead of the individual refund procedure described above, a U.S. resident may use an IT-supported quick-refund procedure (“Datenträgerverfahren – DTV”/ “Data Medium Procedure – DMP”). If the U.S. resident's bank or broker elects to participate in the DMP, it will perform administrative functions necessary to claim the Treaty refund for the beneficiaries. The refund beneficiaries must provide specified information to the DMP participant and confirm to the DMP participant that they meet the conditions of the Treaty provisions and that they authorize the DMP participant to file applications and receive notices and payments on their behalf.

The refund beneficiaries also must provide a “Certification of U.S. Tax Residency” on IRS Form 6166 with the DMP participant. In addition, if the individual refund procedure requires a withholding tax certificate (see above), such certificate is generally also necessary under the DMP.

The German tax authorities reserve the right to audit the entitlement to tax refunds for several years following their payment pursuant to the Treaty in individual cases. The DMP participant must assist with the audit by providing the necessary details or by forwarding the queries to the respective refund beneficiaries/shareholders. Presently the DMP cannot be used in all cases: i.e. if the Treaty tax rate is below 15% or if a holder of Depository Receipts claims a refund, the application of DMP is excluded.

The German tax authorities will issue refunds denominated in euros. In the case of shares held through banks or brokers participating in the Depository Trust Company, the refunds will be issued to the Depository Trust Company, which will convert the refunds to U.S. dollars. The resulting amounts will be paid to banks or brokers for the account of holders.

If a U.S. resident holds its shares through a bank or broker who elects to participate in the DMP, it could take at least three weeks for it to receive a refund after a combined claim for refund has been filed with the German tax authorities. If a U.S. resident files a claim for refund directly with the German tax authorities, the time until the receipt of a refund is much longer. The length of time between filing a claim for refund and receipt of that refund is uncertain and we can give no assurances as to when any refund will be received.

The Bundeszentralamt für Steuern published on its website a FAQ (https://www.bzst.de/EN/Businesses/Capital_Yield_Tax_Relief/Written_application_procedure/Refund_Procedure_pursuant_50d_1_EStG/refund_procedure_pursuant_50d_1_estg_node.html), i.e. with the following hint: “The high volume of applications received may lead to longer processing times. To avoid further delays, the Federal Central Tax Office does not respond to status queries.”

For dividends received by a U.S. holder after 2024 withholding tax certificates will be replaced by electronic submission of data directly to the tax authorities by the institution that withheld the tax.

Taxation of Capital Gains

Under the Treaty, a U.S. resident will generally not be subject to German capital gains tax in respect of a sale or other disposition of shares. For U.S. federal income tax purposes, a U.S. holder will generally recognize capital gain or loss on the sale or other disposition of shares in an amount equal to the difference between such holder's tax basis in the shares and the U.S. dollar value of the amount realized from their sale or other disposition. Such gain or loss will be long-term capital gain or loss if the shares were held for more than one year. The net amount of long-term capital gain realized by an individual generally is subject to taxation at a lower rate than ordinary income. Any such gain generally would be treated as income arising from sources within the United States; any such loss would generally be allocated against U.S. source income. The ability to offset capital losses against ordinary income is subject to limitations.

Shareholders whose shares are held in an account with a German bank or financial services institution (including a German branch of a non-German bank or financial services institution) are urged to consult their own advisors. This summary does not discuss their particular tax situation.

United States Information Reporting and Backup Withholding

Dividends and payments of the proceeds on a sale of shares, paid within the United States or through certain U.S.-related financial intermediaries are subject to information reporting and may be subject to backup withholding unless the U.S. resident (i) is a corporation (other than an S corporation) or other exempt recipient or (ii) provides a taxpayer identification number and certifies (on IRS Form W-9) that no loss of exemption from backup withholding has occurred. Shareholders that are not U.S. persons generally are not subject to information reporting or backup withholding.

However, a non-U.S. person may be required to provide a certification (generally on IRS Form W-8BEN or W-8BEN-E) of its non-U.S. status in connection with payments received in the United States or through a U.S.-related financial intermediary.

Backup withholding tax is not an additional tax, and any amounts withheld under the backup withholding rules will be allowed as a refund or a credit against a holder's U.S. federal income tax liability, provided the required information is furnished to the IRS.

Shareholders may be subject to other U.S. information reporting requirements. Shareholders should consult their own advisors regarding the application of U.S. information reporting rules in light of their particular circumstances.

German Gift and Inheritance Taxes

Under the current estate, inheritance and gift tax treaty between the United States and Germany (the "Estate Tax Treaty"), a transfer of shares generally will not be subject to German gift or inheritance tax so long as the donor or decedent, and the heir, donee or other beneficiary, were not domiciled in Germany for purposes of the Estate Tax Treaty at the time the gift was made, or at the time of the decedent's death, and the shares were not held in connection with a permanent establishment or fixed base in Germany.

The Estate Tax Treaty provides a credit against U.S. federal estate and gift tax liability for the amount of inheritance and gift tax paid in Germany, subject to certain limitations, where shares are subject to German inheritance or gift tax and United States federal estate or gift tax.

Other German Taxes

There are currently no German net wealth, transfer, stamp or other similar taxes that would apply to a U.S. resident as a result of the receipt, purchase, ownership or sale of shares.

Dividends and Paying Agents

Not required because this document is filed as an Annual Report.

Statement by Experts

Not required because this document is filed as an Annual Report.

Documents on Display

Deutsche Bank is subject to the informational requirements of the Securities Exchange Act of 1934, as amended. In accordance with these requirements, it files reports and other information with the Securities and Exchange Commission. The Group's Securities and Exchange Commission filings are available at the Securities and Exchange Commission's website at www.sec.gov under File Number 001-15242.

Subsidiary Information

Not applicable.

Item 11: Quantitative and Qualitative Disclosures about Credit, Market and Other Risk

For Quantitative and Qualitative Disclosures about Credit, Market and Other Risk, please see “Management Report: Risk Report” in the Annual Report 2022.

Please see pages S-1 through S-10 of the Supplemental Financial Information (Unaudited), which pages are included herein, for information required by Subpart 1400 of SEC Regulation S-K.

Item 12: Description of Securities other than Equity Securities

Deutsche Bank’s ordinary shares are not represented by American Depositary Receipts and accordingly no information is required to be provided pursuant to Item 12.D.3 and Item 12.D.4. The remainder of the information required by this Item 12 and by Instruction 2(d) under the Instructions as to Exhibits of Form 20-F is provided as Exhibit 2.2 to this Annual Report on Form 20-F.

PART II

Item 13: Defaults, Dividend Arrearages and Delinquencies

Not applicable.

Item 14: Material Modifications to the Rights of Security Holders and Use of Proceeds

According to the German Banking Act (*Kreditwesengesetz*) and the German Recovery and Resolution Act (*Sanierungs- und Abwicklungsgesetz*), additional restrictions on distributions may apply or will apply, as the case may be, when Deutsche Bank is in breach of capital requirements. In particular, a credit institution, such as Deutsche Bank, will be considered as failing to meet the combined buffer requirement when it does not have sufficient own funds in an amount and of the quality needed to meet at the same time (i) its minimum capital requirements under the CRR, (ii) certain “Pillar 2” capital requirements, and (iii) the sum of the capital buffers applicable to the relevant credit institution. In calculating the respective amounts that may be distributed (so-called “Maximum Distributable Amount” or “MDA”), the bank will have to take into account certain “Pillar 2” capital requirements. Since January 2022, the Group has also been subject to MDA restrictions in instances of non-compliance with its leverage ratio buffer introduced in the CRR (so-called “L-MDA”). In addition, Deutsche Bank is subject to additional restrictions on distributions (so-called “M-MDA”) if it breaches the harmonized minimum TLAC requirement under the CRR and its institution-specific minimum requirement for own funds and eligible liabilities set by the Single Resolution Board.

Item 15: Controls and Procedures

Disclosure Controls and Procedures

An evaluation was carried out under the supervision and with the participation of Deutsche Bank’s management, including the Bank’s Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the Bank’s disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934) as of December 31, 2022. There are, as described below, inherent limitations to the effectiveness of any control system, including disclosure controls and procedures. Accordingly, even effective disclosure controls and procedures can provide only reasonable assurance of achieving their control objectives. Based upon such evaluation, the Chief Executive Officer and Chief Financial Officer concluded that the design and operation of Deutsche Bank’s disclosure controls and procedures were effective as of December 31, 2022.

Management's Annual Report on Internal Control over Financial Reporting

Management of Deutsche Bank Aktiengesellschaft, together with its consolidated subsidiaries, is responsible for establishing and maintaining adequate internal control over financial reporting. Deutsche Bank's internal control over financial reporting is a process designed under the supervision of the Bank's Chief Executive Officer and its Chief Financial Officer to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the firm's financial statements for external reporting purposes in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB) and endorsed by the European Union (EU). As of December 31, 2022, Deutsche Bank management conducted an assessment of the effectiveness of the bank's internal control over financial reporting based on the framework established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on the assessment performed, management has determined that Deutsche Bank's internal control over financial reporting as of December 31, 2022 was effective based on the COSO framework (2013).

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, the registered public accounting firm that audited the financial statements included in this document, has issued a report on Deutsche Bank's internal control over financial reporting, which is set forth below.

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Supervisory Board of Deutsche Bank Aktiengesellschaft:

Opinion on Internal Control Over Financial Reporting

We have audited Deutsche Bank Aktiengesellschaft's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Deutsche Bank Aktiengesellschaft (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2022 and 2021, the related consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2022, the related notes and the specific disclosures described in Note 1 to the consolidated financial statements as being part of the financial statements, and our report dated March 13, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft

Eschborn/Frankfurt am Main, Germany

March 13, 2023

Change in Internal Control over Financial Reporting

There was no change in Deutsche Bank's internal control over financial reporting identified in connection with the evaluation referred to above that occurred during the year ended December 31, 2022 that has materially affected, or is reasonably likely to materially affect, the bank's internal control over financial reporting.

A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. As such, disclosure controls and procedures or systems for internal control over financial reporting may not prevent all error and all fraud. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the control. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and any design may not succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with the policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

Item 16A: Audit Committee Financial Expert

Please see "Corporate Governance Statement according to Sections 289f and 315d of the German Commercial Code: Auditing and Controlling: Audit Committee Financial Expert" in the Annual Report 2022.

Item 16B: Code of Ethics

Please see "Corporate Governance Statement according to Sections 289f and 315d of the German Commercial Code: Values and Leadership Principles of Deutsche Bank AG and Deutsche Bank Group: Deutsche Bank Group Code of Conduct and Code of Ethics for Senior Financial Officers" in the Annual Report 2022.

Item 16C: Principal accountant fees and services

Please see “Management Report: Corporate Governance Statement/Corporate Governance Report: Auditing and Controlling: Principal Accountant Fees and Services” in the Annual Report 2022.

Item 16D: Exemptions from the Listing Standards for Audit Committees

Deutsche Bank’s common shares are listed on the New York Stock Exchange, the corporate governance rules of which require a foreign private issuer such as the bank to have an audit committee that satisfies the requirements of Rule 10A-3 under the U.S. Securities Exchange Act of 1934. These requirements include a requirement that the audit committee be composed of members that are “independent” of the issuer, as defined in the Rule, subject to certain exemptions, including an exemption for employees who are not executive officers of the issuer if the employees are elected or named to the board of directors or audit committee pursuant to the issuer’s governing law or documents, an employee collective bargaining or similar agreement or other home country legal or listing requirements. The German Co-Determination Act of 1976 (*Mitbestimmungsgesetz*) requires that the shareholders elect half of the members of the supervisory board of large German companies, such as Deutsche Bank, and that employees in Germany elect the other half. Employee-elected members are typically themselves employees or representatives of labor unions representing employees. Pursuant to law and practice, committees of the Supervisory Board are typically composed of both shareholder- and employee-elected members. Of the current members of the Audit Committee, five – Manja Eifert, Gabriele Platscher, Detlef Polaschek, Bernd Rose and Stefan Viertel – are current employees of Deutsche Bank who have been elected as Supervisory Board members by the employees. None of them is an executive officer. Accordingly, their service on the Audit Committee is permissible pursuant to the exemption from the independence requirements provided for by paragraph (b)(1)(iv)(C) of the Rule. The Group does not believe the reliance on such exemption would materially adversely affect the ability of the Audit Committee to act independently and to satisfy the other requirements of the Rule.

Item 16E: Purchases of Equity Securities by the Issuer and Affiliated Purchasers

In 2022, Deutsche Bank repurchased a total of 29,300,000 shares, for group purposes pursuant to share buybacks authorized by the Annual General Meeting. None were via derivatives. During the period from January 1, 2022, until the 2022 Annual General Meeting on May 19, 2022, the bank repurchased 29,300,000 shares, of which none were via derivatives, of the bank’s ordinary shares pursuant to the authorization granted by the Annual General Meeting on May 27, 2021, at an average price of € 13.47 and for a total consideration of € 394.6 million. This authorization was replaced by a new authorization to buy back shares approved by the Annual General Meeting on May 19, 2022. Under the new authorization, up to 206,677,313 shares may be repurchased through April 30, 2027. Of these, 103,338,657 shares may be purchased by using derivatives. At December 31, 2022, the number of shares held in Treasury from buybacks totaled 2.4 million. This figure stems from 0.6 million shares at the beginning of the year, plus 29.3 million shares from buybacks in 2022, less 27.6 million shares which were used to fulfill delivery obligations in the course of share-based compensation of employees. On February 28, 2023, Deutsche Bank cancelled 26,530,172 of no par value ordinary registered shares owned by Deutsche Bank representing € 67,917,240.32. Following this cancellation, Deutsche Bank’s issued share capital amounted to € 5,223,021,975.04 divided into 2,040,242,959 no par value ordinary registered shares.

In addition to these share buybacks for group purposes, pursuant to a shareholder authorization approved at Deutsche Bank’s 2022 Annual General Meeting, the bank is authorized to buy and sell, for the purpose of securities trading, the bank’s ordinary shares through April 30, 2027, provided that number of shares held for this purpose may not at any time exceed 10 % of the company’s share capital. The shares may be bought through the stock exchange or by means of a public purchase offer to all shareholders. The gross volume of these securities trading transactions is often large, and even the net amount of such repurchases or sales may, in a given month, be large, though over longer periods of time such transactions tend to offset and are in any event constrained by the 10 % of share capital limit. These securities trading transactions consist predominantly of transactions on major non-US securities exchanges. Deutsche Bank also enters into derivative contracts with respect to the bank’s shares and limited to shares in a maximum volume of 5 % of the actual share capital.

The following table sets forth, for each month in 2022 and for the year as a whole, the total gross number of Deutsche Bank's shares repurchased by the bank and our affiliated purchasers (pursuant to both activities described above), the total gross number of shares sold, the net number of shares purchased or sold, the average price paid per share (based on the gross shares repurchased), the number of shares that were purchased for group purposes mentioned above and the maximum number of shares that at that date remained eligible for purchase under such programs.

Issuer Purchases of Equity Securities in 2022

Month	Total number of shares purchased	Total number of shares sold	Net number of shares purchased or (sold)	Average price paid per share (in €)	Number of shares purchased for group purposes	Maximum number of shares that may yet be purchased under plans or programs
January	2,000,000	(10,699)	2,010,699	11.91	12,000,000	194,677,313
February	27,300,000	3,149,851	24,150,149	13.58	17,300,000	177,377,313
March	13,346,087	18,527,506	(5,181,419)	11.24	0	177,377,313
April	13,184,085	140	13,183,945	11.38	0	177,377,313
May	0	171,754	(171,754)	0.00	0	206,677,313
June	0	884,058	(884,058)	0.00	0	206,677,313
July	0	180	(180)	0.00	0	206,677,313
August	0	937,578	(937,578)	0.00	0	206,677,313
September	0	3,233,249	(3,233,249)	0.00	0	206,677,313
October	0	(1,602)	1,602	0.00	0	206,677,313
November	0	103,986	(103,986)	0.00	0	206,677,313
December	0	581,501	(581,501)	0.00	0	206,677,313
Total 2022	55,830,172	27,577,502	28,252,670	12.44	29,300,000	206,677,313

At December 31, 2022, the number of shares held by Deutsche Bank in treasury totaled 28,931,618. This figure stems from 678,948 shares at the beginning of the year, plus 28,252,670 net shares purchased in 2022. At December 31, 2022, Deutsche Bank's issued share capital consisted of 2,066,773,131 ordinary shares, of which 2,037,841,513 were outstanding.

Item 16F: Change in Registrant's Certifying Accountant

Not applicable.

Item 16G: Corporate Governance

Deutsche Bank's common shares are listed on the New York Stock Exchange, as well as on all seven German stock exchanges. Set forth below is a description of the significant ways in which the corporate governance practices differ from those applicable to U.S. domestic companies under the New York Stock Exchange's listing standards as set forth in its Listed Company Manual (the "NYSE Manual").

The Legal Framework. Corporate governance principles for German stock corporations (*Aktiengesellschaften*) are set forth in the German Stock Corporation Act (*Aktengesetz*), the German Co-Determination Act of 1976 (*Mitbestimmungsgesetz*) and the German Corporate Governance Code (*Deutscher Corporate Governance Kodex*, referred to as the Code).

The Two-Tier Board System of a German Stock Corporation. The German Stock Corporation Act provides for a clear separation of management and oversight functions. It therefore requires German stock corporations to have both a supervisory board (*Aufsichtsrat*) and a management board (*Vorstand*). These boards are separate; no individual may be a member of both. Both the members of the management board and the members of the supervisory board must exercise the standard of care of a diligent businessperson to the company. In complying with this standard of care they are required to take into account a broad range of considerations, including the interests of the company and those of its shareholders, employees and creditors.

The management board is responsible for managing the company and representing the company in its dealings with third parties. The management board is also required to ensure appropriate risk management within the corporation and to establish an internal monitoring system. The members of the management board, including its chairperson or speaker, are regarded as peers and share a collective responsibility for all management decisions.

The supervisory board appoints and removes the members of the management board. It also may appoint a chairperson (CEO) and one or more deputy chairpersons of the management board. Although it is not permitted to make management decisions, the supervisory board has comprehensive monitoring functions with respect to the activities of the management board, including advising the management board and participating in decisions of fundamental importance to the company. To ensure that these monitoring functions are carried out properly, the management board must, among other things, regularly report to the supervisory board with regard to current business operations and business planning, including any deviation of actual developments from concrete and material targets previously presented to the supervisory board. The supervisory board may also request special reports from the management board at any time. Transactions of fundamental importance to the company, such as major strategic decisions or other actions that may have a fundamental impact on the company's assets and liabilities, financial condition or results of operations, may be subject to the consent of the supervisory board. Pursuant to the bank's Articles of Association (*Satzung*), such transactions include the granting of general powers of attorney granting of credits, including the acquisition of participations in other companies for which the German Banking Act (*Kreditwesengesetz*) requires approval by the Supervisory Board, as well as major acquisitions or disposals of real estate or other participations.

Pursuant to the German Co-Determination Act, Deutsche Bank's Supervisory Board consists of representatives elected by the shareholders and representatives elected by the employees in Germany. Based on the total number of Deutsche Bank employees in Germany these employees have the right to elect one-half of the total of twenty Supervisory Board members. The chairperson of the Supervisory Board of Deutsche Bank is a shareholder representative who has the deciding vote in the event of a tie.

This two-tier board system contrasts with the unitary board of directors envisaged by the relevant laws of all U.S. states and the New York Stock Exchange listing standards for U.S. companies.

German companies which have their shares listed on a stock exchange must each year issue a statement on the company's corporate governance (corporate governance statement) and either include such statement in their annual management report or publish it separately on their website.

The Recommendations of the Code. The Code was issued in 2002 by a commission composed of German corporate governance experts appointed by the German Federal Ministry of Justice in 2001. The Code was last amended in April 28, 2022 with effect as of June 27, 2022. It describes and summarizes the basic mandatory statutory corporate governance principles found in the provisions of German law. In addition, it contains supplemental recommendations and suggestions for standards on responsible corporate governance intended to reflect generally accepted best practice.

The Code is structured from a task perspective and addresses seven core areas of corporate governance. These are the tasks of (a) management and supervision, (b) appointment to the management board, (c) composition of the supervisory board, (d) supervisory board procedures, (e) conflicts of interest, (f) transparency and external reporting as well as (g) the remuneration of the management board and the supervisory board. The Code contains three types of provisions. First, the Code contains principles which reflect material legal requirements for responsible governance, and are used in the Code to inform investors and other stakeholders. The second type of provisions is recommendations. While these are not legally binding, Section 161 of the German Stock Corporation Act requires that any German exchange-listed company declare annually that the company complies with the recommendations of the Code or, if not, which recommendations the company does not comply with and the reasons for the non-compliance ("comply or explain"). The third type of Code provisions comprises suggestions which companies may choose not to comply with without disclosure.

In its last Declaration of Conformity of October 26, 2022, the Management Board and the Supervisory Board of Deutsche Bank stated that, since the last Declaration of Conformity issued on October 28, 2021, it has acted and will act in the future in conformity with the recommendations of the Code, with certain specified exceptions. The Declaration of Conformity is available on Deutsche Bank's internet website at www.db.com/ir/en/documents.htm.

Supervisory Board Committees. The supervisory board may form committees. Pursuant to the German Stock Corporation Act, any supervisory board committee must regularly report to the supervisory board.

The German Co-Determination Act requires that the supervisory board form a mediation committee to propose candidates for the management board in the event that the two-thirds majority of the members of the supervisory board needed to appoint members of the management board is not met.

Section 107 (4) of the German Stock Corporation Act also requires that companies of “public interest”, including, among others, listed companies and credit institutions, establish an “audit committee” to deal with the supervision of accounting processes, the efficiency of the internal control system the risk management system and the internal audit system as well as with the annual auditing, in particular with the selection and the independence of the external auditor and the additional services rendered by the external auditor. The Code also recommends establishing a “nomination committee” comprised only of shareholder-elected supervisory board members to prepare the supervisory board’s proposals for the election or appointment of new shareholder representatives to the supervisory board. In general, the Code recommends that the supervisory board shall form, depending on the specific circumstances of the enterprise and the number of supervisory board members, committees of members with relevant specialist expertise which can handle subjects, such as corporate strategy, compensation of the members of the management board, investments and financing.

Sections 25d (7) to (12) of the German Banking Act require, depending on the size and complexity of the respective credit institution, the establishment of supervisory board committees with specific tasks to be performed as follows: risk committee, audit committee, nomination committee (with tasks and composition requirements different from those set out in the Code) and compensation control committee. The Code’s recommendation that the nomination committee shall only comprise shareholder representatives is not complied with by Deutsche Bank AG because of mandatory special rules set forth in the German Banking Act, which assign further tasks to the nomination committee in addition to the preparation of proposals for the appointment of new shareholder representatives to the supervisory board. These further tasks do not justify the exclusion of employee representatives from the nomination committee. Based on an earlier version of the Code, which was applicable until March 20, 2020, this non-compliance had to be disclosed and justified in the annual Declaration of Conformity. The Code, as amended, provides that credit institutions and insurance companies are exempt from recommendations of the Code which conflict with special rules or regulations applicable to them. However, the Code recommends that in the case of such conflicts, companies indicate in their annual corporate governance statement what recommendations of the Code were not applicable to them.

The Supervisory Board of Deutsche Bank has established a Chairman’s Committee (*Präsidialausschuss*) which is inter alia responsible for conclusion, amendment and termination of employment and pension contracts with members of the Management Board, taking into account the responsibility of the Supervisory Board as a whole for the remuneration of the members of the Management Board, a Nomination Committee (*Nominierungsausschuss*), an Audit Committee (*Prüfungsausschuss*), a Risk Committee (*Risikoausschuss*), a Regulatory Oversight Committee (formerly Integrity Committee) (*Regulatory Oversight Ausschuss*), a Compensation Control Committee (*Vergütungskontrollausschuss*), a Strategy and Sustainability Committee (*Strategie- und Nachhaltigkeitsausschuss*), a Technology, Data and Innovation Committee (*Technologie-, Daten- und Innovationsausschuss*) and a Mediation Committee (*Vermittlungsausschuss*). The functions of a nominating/corporate governance committee and of a compensation committee required by the NYSE Manual for U.S. companies listed on the NYSE are therefore performed by the Supervisory Board or one of its committees, in particular the Chairman’s Committee, the Compensation Control Committee and the Mediation Committee.

Independent Board Members. The NYSE Manual requires that a majority of the members of the board of directors of a NYSE listed U.S. company and each member of its nominating/corporate governance, compensation and audit committees be “independent” according to strict criteria and that the board of directors determines that such member has no material direct or indirect relationship with the company.

As a foreign private issuer, Deutsche Bank is not subject to these requirements. However, its audit committee must meet the more lenient independence requirement of Rule 10A-3 under the Securities Exchange Act of 1934. German corporate law does not require an affirmative independence determination, meaning that the Supervisory Board need not make affirmative findings that audit committee members are independent. However, the German Stock Corporation Act and the Code, as the case may, be contain several rules, recommendations and suggestions to ensure the supervisory board’s independent advice to, and supervision of, the management board. As noted above, no member of the management board may serve on the supervisory board (and vice versa). Supervisory board members will not be bound by directions or instructions from third parties. Any advisory, service or similar contract between a member of the supervisory board and the company is subject to the supervisory board’s approval. A similar requirement applies to loans granted by the company to a supervisory board member or other persons, such as certain members of a supervisory board member’s family. In addition, the German Stock Corporation Act prohibits a person who within the last two years was a member of the management board from becoming a member of the supervisory board of the same company unless he or she is elected upon the proposal of shareholders holding more than 25 % of the voting rights of the company.

The Code also recommends that each member of the supervisory board inform the supervisory board of any conflicts of interest. In the case of material conflicts of interest or ongoing conflicts, the Code recommends that the mandate of the Supervisory Board member shall end either as a result of such supervisory board member's withdrawal or, failing which, based on his or her removal from office by the shareholders' meeting. The Code further recommends that any conflicts of interest that have occurred be reported by the supervisory board at the annual general meeting, together with the action taken, and that potential conflicts of interest also be taken into account in the nomination process for the election of supervisory board members.

Audit Committee Procedures. Pursuant to the NYSE Manual the audit committee of a U.S. company listed on the NYSE must have a written charter addressing its purpose, an annual performance evaluation, and the review of an auditor's report describing internal quality control issues and procedures and all relationships between the auditor and the company. The Audit Committee of Deutsche Bank operates under written terms of reference and reviews the efficiency of its activities regularly.

Disclosure of Corporate Governance Guidelines. Deutsche Bank discloses its Articles of Association, the Terms of Reference of its Management Board, its Supervisory Board, the Chairman's Committee, the Audit Committee, the Risk Committee, the Regulatory Oversight Committee (former Integrity Committee), the Compensation Control Committee, the Nomination Committee, the Strategy Committee and the Technology, Data and Innovation Committee, its Declaration of Conformity under the Code pursuant to Section 161 of the German Stock Corporation Act, the Corporate Governance Statement and other documents pertaining to its corporate governance on its internet website at www.db.com/ir/en/documents.htm.

Item 16H: Mine Safety Disclosure

Not applicable

Item 16I: Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

Disclosures Under Iran Threat Reduction and Syria Human Rights Act of 2012

Under Section 219 of the Iran Threat Reduction and Syria Human Rights Act of 2012, which added Section 13(r) of the U.S. Securities Exchange Act of 1934, as amended, an issuer of securities registered under the Securities Exchange Act of 1934 is required to disclose in its periodic reports filed under the Securities Exchange Act of 1934 certain of its activities and those of its affiliates relating to Iran and to other persons sanctioned by the U.S. under programs relating to terrorism and proliferation of weapons of mass destruction that occurred during the period covered by the report. The bank describes below a number of potentially disclosable activities of Deutsche Bank AG and its affiliates. Disclosure is generally required regardless of whether the activities, transactions or dealings were conducted in compliance with applicable law. Deutsche Bank also reports transactions in which other Iranian persons or entities listed on OFAC sanctions lists were involved, whether or not they are directly or indirectly owned or controlled by the Iranian government.

Legacy Contractual Obligations Related to Guarantees and Letters of Credit. Prior to 2007, Deutsche Bank provided guarantees to a number of Iranian entities. In almost all of these cases, the bank issued counter-indemnities in support of guarantees issued by Iranian banks because the Iranian beneficiaries of the guarantees required that they be backed directly by Iranian banks. In 2007, the bank made a decision to discontinue issuing new guarantees to Iranian or Iran-related beneficiaries. Although the pre-existing guarantees stipulate that they must be either extended or honored if the bank receives such a demand and is legally not able to terminate these guarantees, the firm decided to reject any "extend or pay" demands under such guarantees. Even though the bank had exited, where possible, many of these guarantees, guarantees with an aggregate face amount of approximately € 7.0 million are still outstanding as of year-end 2022. The gross revenues from this business in 2022 which the bank received from non-Iranian parties were approximately € 32,000 and the net profit derived from these activities was less than this amount.

Deutsche Bank also has outstanding legacy guarantees in relation to a Syrian bank sanctioned by the United States under its non-proliferation program. The aggregate face amount of these legacy guarantees was approximately € 9.1 million as of December 31, 2022, the gross revenues received from non-Syrian parties for these guarantees were approximately € 65,000 in 2022 and the net profit derived from these activities was less than this amount. The bank intends to exit these guarantee arrangements.

Payments Executed. Deutsche Bank continues to severely restrict its policy on Iran and consequently the execution of payments relating to Iran.

Incoming Payments. In 2022, no incoming payments were executed on behalf of Iranian parties outside of Germany; with regards to the Iranian Embassy in Germany, see below.

Outgoing Payments. In 2021, no outgoing payments were executed in favor of Iranian parties outside of Germany; with regards to the Iranian Embassy in Germany, see below.

Operations of Iranian Bank Branches and Subsidiaries in Germany. Several Iranian banks, including Bank Melli Iran, Bank Saderat, Bank Sepah, and Europäisch-Iranische Handelsbank, have branches or offices in Germany, even though their funds and other economic resources had been frozen earlier under European law. As part of the payment clearing system in Germany and other European countries, when these branches or offices needed to make payments in Germany or Europe to cover their day-to-day operations such as rent, taxes, insurance premiums and salaries for their remaining staff, or for any other kind of banking-related operations, fund transfers from these Iranian banks had been accepted through Target2 or in SEPA format.

In 2022, Deutsche Bank executed approximately € 1.4 million in (almost only in-coming) transfers through Target2 or SEPA across approximately 1,000 transactions and credited the relevant amounts to the non-Iranian clients. The gross revenues derived from these payments were approximately € 4,300.

The bank does not consider the execution of such transactions to be significant and expects to continue to execute such transactions in the future.

Maintaining of Accounts for Iranian Consulates and Embassies. In 2022, Iranian embassies and consulates in Germany held accounts with Deutsche Bank. The purpose of these accounts is the funding of day-to-day operational costs of the embassies and consulates, such as salaries, rent and electricity. In 2022, the total volume of outgoing payments from these accounts was approximately € 7.1 million which have been funded through € 9.4 million of incoming payments. From these activities, the bank derived gross revenues of approximately € 6500 and net profits which were less than this amount. The German government has requested that Deutsche Bank provide these services to enable the government of Iran to conduct its diplomatic relations and the bank intends to continue maintenance of such accounts.

Activities of Entities in Which Deutsche Bank Has Interests. Section 13(r) requires the Group to provide the specified disclosure with respect to Deutsche Bank and its "affiliates," as defined in Exchange Act Rule 12b-2. Although the bank has minority equity interests in certain entities that could arguably result in these entities being deemed "affiliates," it does not have the authority or the legal ability to acquire in every instance the information from these entities that would be necessary to determine whether they are engaged in any disclosable activities under Section 13(r). In some cases, legally independent entities are not permitted to disclose the details of their activities to the bank because of German privacy and data protection laws or the applicable banking laws and regulations. In such cases, voluntary disclosure of such details could violate such legal and/or regulatory requirements and subject the relevant entities to criminal prosecution or regulatory investigations.

PART III

Item 17: Financial Statements

Not applicable.

Item 18: Financial Statements

The Financial Statements of this Annual Report on Form 20-F consist of the Consolidated Financial Statements including Notes 1 to 44 thereto, which are set forth as Part 2 of the Annual Report 2022, and, as described in Note 1 “Significant Accounting Policies and Critical Accounting Estimates” thereto under “Basis of accounting – IFRS 7 disclosures (including war in Ukraine and climate risk related disclosures)”, certain parts of the Management Report set forth as Part 1 of the Annual Report 2022.

The Consolidated Financial Statements have been audited by Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, Eschborn, Germany - PCAOB ID: 1251, as described in their “Report of Independent Registered Public Accounting Firm” included in the Annual Report 2022.

Item 19: Exhibits

We have filed the following documents as exhibits to this document.

Exhibit number	Description of Exhibit
1.1	English translation of the Articles of Association of Deutsche Bank AG.
2.1	The total amount of long-term debt securities of us or our subsidiaries authorized under any instrument does not exceed 10 percent of the total assets of our Group on a consolidated basis. We hereby agree to furnish to the Commission, upon its request, a copy of any instrument defining the rights of holders of long-term debt of us or of our subsidiaries for which consolidated or unconsolidated financial statements are required to be filed.
2.2	Descriptions of securities registered under the Securities Exchange Act of 1934.
4.1	Equity Plan Rules 2018, furnished as Exhibit 4.6 to our Registration Statement on Form S-8 No. 333-223301 and incorporated by reference herein.
4.2	Equity Plan Rules 2019, furnished as Exhibit 4.5 to our 2018 Annual Report on Form 20-F and incorporated by reference herein.
4.3	Equity Plan Rules 2020, furnished as Exhibit 4.5 to our 2019 Annual Report on Form 20-F and incorporated by reference herein.
4.4	Equity Plan Rules 2021, furnished as Exhibit 4.5 to our 2020 Annual Report on Form 20-F and incorporated by reference herein.
4.5	Equity Plan Rules 2022, furnished as Exhibit 4.6 to our 2021 Annual Report on Form 20-F and incorporated by reference herein.
4.6	Equity Plan Rules 2023.
4.7	Restricted Share Plan Rules 2020, furnished as Exhibit 4.9 to our 2019 Annual Report on Form 20-F and incorporated by reference herein.
4.8	Restricted Share Plan Rules 2021, furnished as Exhibit 4.10 to our 2020 Annual Report on Form 20-F and incorporated by reference herein.
4.9	Restricted Share Plan Rules 2022, furnished as Exhibit 4.9 to our 2021 Annual Report on Form 20-F and incorporated by reference herein.
4.10	Restricted Share Plan Rules 2023.
8.1	List of Subsidiaries.
12.1	Principal Executive Officer Certifications Required by 17 C.F.R. 240.13a-14(a).
12.2	Principal Financial Officer Certifications Required by 17 C.F.R. 240.13a-14(a).
13.1	Chief Executive Officer Certification Required by 18 U.S.C. Section 1350.
13.2	Chief Financial Officer Certification Required by 18 U.S.C. Section 1350.
15.1	Consent of Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft.
101.1	Interactive Data File.

Signatures

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and has duly caused and authorized the undersigned to sign this annual report on its behalf.

Date: March 17, 2023

Deutsche Bank Aktiengesellschaft

/s/ CHRISTIAN SEWING

Christian Sewing
Chairman of the Management Board
Chief Executive Officer

/s/ JAMES VON MOLTKE

James von Moltke
Member of the Management Board
President and Chief Financial Officer

Deutsche Bank



Annual Report 2022

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Combined Management Report

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Operating and Financial Review

The following discussion and analysis should be read in conjunction with the consolidated financial statements and the related notes. Deutsche Bank's Operating and Financial Review includes qualitative and quantitative disclosures on Segmental Results of Operations and entity wide disclosures on net revenue components as required by International Financial Reporting Standard (IFRS) 8, "Operating Segments". For additional Business Segment disclosure under IFRS 8 please refer to Note 4 "Business Segments and Related Information" of the Consolidated Financial Statements. Forward-looking statements are disclosed in the Outlook section.

Executive summary

Global economy

Economic growth (in %) ¹	2022 ²	2021 ³	Main driver
Global Economy	3.3	6.2	The global economy proved robust in the second half of 2022. Industrial production and trade expanded, albeit with a loss of momentum towards the end of the year. The economic impact of the war in Ukraine remained a headwind, while the improvement in the pandemic situation provided support. Consumer prices rose strongly, in some regions to historic levels. However, the peak may have passed by the end 2022.
Of which:	2.7	5.3	The industrialized countries were resilient, but with slowing momentum toward the end of the year. Although the sharp rise in consumer prices dampened private consumption, easing supply bottlenecks and falling freight costs supported GDP growth. In Europe in particular, the spillovers from the war in Ukraine contributed to price pressure. To counter inflation, the central banks tightened their monetary policy significantly.
Industrialized countries			
Emerging markets	3.7	6.9	Emerging market economies expanded robustly in the second half of 2022, particularly in Asia but also in Latin America. Falling energy prices were a tailwind, as was the robust demand from industrialized countries. Central banks continued to tighten monetary policy
Eurozone Economy	3.5	5.3	Eurozone economies made a robust start to the second half of 2022, but momentum slowed towards the end of the year. Energy prices pushed the inflation rate to a record high in the fourth quarter. The loss of purchasing power slowed private consumption and high energy costs dampened industrial production. Expansionary fiscal policy provided support. The ECB raised key interest rates to break the inflation momentum.
Of which: German economy	1.8	2.6	The German economy adapted to geopolitically driven shifts in the supply of fossil fuels. Gas rationing did not occur, and storage levels developed favorably. Consumer price inflation rose sharply and marked an all-time high during the second half of 2022. However, fiscal measures prevented a more severe slump in growth, although momentum slowed toward the end of 2022. The labor market was a factor of stability.
U.S. Economy	2.1	5.9	The US economy expanded robustly in the second half of the year. The labor market remained very tight and, along with energy prices, contributed to a sharp rise in inflation. The US Fed repeatedly raised the key interest rate considerably to break the inflation momentum. GDP growth has slowed by the end of 2022, due to headwinds from prices, waning fiscal support, and tighter monetary and financial conditions
Japanese Economy	1.1	2.2	After the government eased the strict pandemic measures, domestic demand gained momentum. With the easing of entry regulations, tourism also picked up again. The Bank of Japan supported the recovery with its expansionary monetary policy. Inflation picked up, but nowhere near as strongly as in other industrialized countries.
Asian Economy⁴	4.2	7.3	The Asian economies continued to expand, benefiting in particular from the recovery of the Chinese economy. The quite favorable development of overseas trading partners also had a positive impact. Consumer prices rose sharply but are expected to have peaked at the end of 2022. Central banks continued to tighten monetary policy
Of which: Chinese Economy	3.0	8.4	The Chinese economy recovered slowly in the course of the second half of 2022. The significant easing of COVID-related restrictions provided positive momentum at the end of the year. However, the property market still was an additional headwind. Fiscal as well as monetary policy measures supported GDP growth.

¹ Annual Real GDP Growth (% YoY). Sources: National Authorities unless stated otherwise.

² Sources: Deutsche Bank Research.

³ Some economic data for 2021 was revised by public statistics authorities due to the economic effects of the pandemic. As a result, this data may differ from that previously published.

⁴ Includes China, Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, Sri Lanka, South Korea, Taiwan, Thailand and Vietnam; excludes Japan.

Banking Industry

Dec 31, 2022

Growth year-over-year (in %)	Corporate Lending	Retail Lending	Corporate Deposits	Retail Deposits	Main driver
Eurozone	5.5	4.0	4.6	3.3	Corporate loan growth accelerated strongly in 2022, before moderating towards yearend. Household lending peaked in summer, before the surge in interest rates pulled down the main driver, mortgage growth. The expansion of customer deposits both corporate and retail, slowed over the course of the year.
Of which: Germany	10.4	4.4	8.4	2.5	Corporate loan volumes grew at the highest rate on record in 2022, driven by working capital needs due to surging inflation and demand for liquidity as a result of the war in Ukraine and surging energy prices. Retail lending moderately slowed as the jump in interest rates put the brakes on mortgage financing. Deposit growth remained elevated with companies, but for households it fell to the lowest level on record during 2022.
U.S.	13.3	9.7	(1.0) ¹	(1.0) ¹	Private-sector lending picked up strongly in 2022, across the board. Outstanding corporate loans have broadly doubled over the past decade. Following two years of mostly double-digit growth throughout the pandemic, the expansion in total deposits came to a halt in 2022, with outstanding deposits essentially stagnating, but having almost doubled since 2012.
China	13.1	5.4	6.7	17.3	Retail lending slowed massively in 2022, to the lowest pace on record, while lending to companies ticked up again. The deposit business with households gained significant momentum, while it remained largely stable with corporates.

¹ Total U.S. deposits as segment breakdown is not available.

In 2022, the global Origination & Advisory industry fee pool was 36% lower than the 2021 record, which marked the end of a decade-long growth cycle. Furthermore this drop was partially masked by the M&A fee pool, which benefitted from the closure of record announced volumes from 2021. The Debt and Equity Origination decline was materially lower again. The key driver was market uncertainty and volatility caused by the sharp increase in inflation due to the global energy crisis, labor shortages and supply chain disruption and the war in Ukraine. These factors combined to push primary and secondary Equity Capital Markets issuances to record lows, while the leveraged loan and high yield markets were also impacted, seeing the lowest fee pool since 2010. The Merger & Acquisition industry fee pool remained robust in 2022, but announced volumes declined throughout the year, which will impact booked fees in first half of 2023. Key drivers of the U.S. market, for example large M&A deals, private equity, and Technology/Healthcare (among others) were most impacted, dropping the U.S.'s contribution to the global fee pool from 54% to 46%. Conversely, Fixed Income & Currencies revenue pools increased materially in 2022, with the heightened levels of volatility and uncertainty that negatively impacted primary origination, driving secondary market activity higher. Activity increased across ten of the most traded currencies globally, rates, emerging markets and commodities. In contrast, credit flow was more challenging with a general trend of spread widening through the year, although the fourth quarter 2022 did see a slight reversal of this trend. Financing products largely maintained the momentum from a strong second half of 2021 through 2022. Client demand remained strong, although the fourth quarter 2022 did start to see a slowdown in capital market activity.

Deutsche Bank Performance

Deutsche Bank reported a net profit of € 5.6 billion for the full year 2022. Net profit was more than double the prior year and the highest since 2007. Net profit in 2022 includes a positive year-end deferred tax valuation adjustment of € 1.4 billion, compared to € 274 million in the prior year, which reflects continued strong performance in the bank's U.S. operations. The bank believes that the results demonstrate the benefits of Deutsche Bank's transformation and that the bank has become significantly more profitable, better balanced and more cost efficient by refocusing business around its core strengths. The bank delivered revenue growth in its core businesses and continued cost reductions. Provisions for credit losses were in line with the guidance provided despite challenging conditions during the year. Focused de-risking of the balance sheet contributed to a solid capital ratio, and the Capital Release Unit fulfilling its de-risking and cost reduction mandate from 2019 through the end of 2022 marks a major milestone in the bank's transformation execution. Accordingly, the Capital Release Unit will cease to be reported as a separate segment with effect from the first quarter of 2023. Deutsche Bank's management intends to recommend to the Annual General Meeting a cash dividend of € 0.30 per share for the financial year 2022, up from € 0.20 per share for the financial year 2021.

The Group's pre-tax profit was € 5.4 billion in 2022, up 55% over 2021. This reflected 6% growth in net revenues with a 5% year-on-year reduction in noninterest expenses, resulting in a cost/income ratio of 75%, in line with the updated guidance of a cost/income ratio of mid-to-low 70s percent for 2022, down from 84% in 2021. The Core Bank, which excludes the Capital Release Unit reported a pre-tax profit of € 6.4 billion in 2022 versus € 4.9 billion in 2021, up 31% year on year and the highest since the Core Bank's formation in 2019. Profit growth in the Core Bank was driven by 6% growth in net revenues to € 27.1 billion and a reduction in noninterest expenses of 3%, despite an increase in bank levies of € 210 million compared with 2021. Post-tax return on average tangible shareholders' equity in Core Bank was 11.1% in 2022, up from 6.6% in 2021, in line with a target of above 9%. Post-tax return on average shareholder's equity in Core Bank was 9.8% in 2022, up from 5.8% in 2021. The Core Bank's cost/income ratio improved to 72%, from 79% in 2021.

Group Key Performance Indicators

	Targets 2022	Status end of 2022	Status end of 2021
Group Post-tax return on average tangible shareholders' equity ¹	8.0%	9.1%	4.0%
Core Bank Post-tax return on average tangible shareholders' equity ²	above 9.0%	11.1%	6.6%
Common Equity Tier 1 capital ratio ⁴	above 12.5%	13.4%	13.2%
Leverage ratio ^{3,4,5}	~ 4.5%	4.6%	4.9%

¹ Based on Net Income attributable to Deutsche Bank shareholders. For further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this report

² Based on Core Bank Net Income attributable to Deutsche Bank shareholders. For further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this report

³ Since April 1, 2022, Deutsche Bank no longer excludes certain central bank exposures (amounting to € 99 billion as of December 31, 2021), based on Article 429a (1) (n) CRR and the ECB Decision 2021/1074 as this temporary exemption during the COVID-19 pandemic ended on March 31, 2022; not applying the temporary exclusion of certain central bank exposures the leverage exposure was € 1,223 billion as of December 31, 2021, corresponding to a leverage ratio of 4.5%

⁴ Further detail on the calculation of this ratio is provided in the Risk Report

⁵ Starting with first quarter of 2022, leverage numbers are presented as reported as the fully loaded definition has been eliminated as resulting only in an immaterial difference; comparative information for earlier periods is still based on Deutsche Bank's earlier fully loaded definition

Net revenues were € 27.1 billion in 2022, an increase of € 1.5 billion, or 6% compared to 2021, the highest since 2016, despite business perimeter reductions as part of the bank's transformation launched in 2019. Net Revenues in the Core Bank increased by 6% to € 27.1 billion, reflecting revenue increases in Corporate Bank, Investment Bank and Private Bank, partly offset by lower revenues in Asset Management and Corporate & Other. Capital Release Unit's net revenues were negative € 28 million as compared to positive € 26 million in the previous year.

Provision for credit losses were € 1.2 billion in 2022, up from € 515 million in 2021. The year-on-year development reflected more challenging macro-economic conditions during most of 2022 against the backdrop of the war in Ukraine, while 2021 benefited from economic recovery following the easing of COVID-19 restrictions. Provision for credit losses was 25 basis points of average loans, up from 12 basis points in 2021.

Noninterest expenses were € 20.4 billion, down 5% year on year. The development partly reflected a significant decline in transformation charges as Deutsche Bank completed the transformation initiatives announced in 2019. This decline more than offset a year-on-year rise in bank levies of 38%, or € 210 million and an impairment of an intangible asset of € 68 million relating to a retail investment management agreement in Asset Management. Litigation provisions increased slightly year on year as a result of settlements and other developments in certain litigation and regulatory enforcement matters. Adjusted costs ex-transformation charges and bank levies were € 19.0 billion, essentially flat compared to the prior year. A 3% rise in compensation and benefits expenses was offset by lower noncompensation expenses, including lower information and technology and professional services expenses.

Income tax benefit was € 107 million in 2022, compared to income tax expense of € 923 million in the prior year. The effective tax rate in 2022 of (2)% benefited from the abovementioned positive deferred tax asset valuation adjustment of € 1.4 billion, reflecting continued strong performance in Deutsche Bank's U.S. operations.

The Common Equity Tier 1 (CET 1) capital ratio was 13.4% at the end of 2022, an increase of 13bps compared to 2021. Leverage ratio was 4.6% at the end of 2022 compared to 4.9% at the end of 2021.

Revenues excluding specific items, Adjusted costs, Adjusted costs excluding transformation charges, Adjusted costs excluding transformation charges and bank levies, Adjusted profit (loss) before tax, Post-tax return on average tangible shareholders' equity and Net Assets (adjusted) are non-GAAP financial measures. Please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this annual report for the definitions of such measures and reconciliations to the IFRS measures on which they are based.

Core Bank results at a glance

in € m.

(unless stated otherwise)

	2022	2021	2020
Net revenues:			
Corporate Bank (CB)	6,335	5,151	5,146
Investment Bank (IB)	10,016	9,631	9,286
Private Bank (PB)	9,155	8,234	8,126
Asset Management (AM)	2,608	2,708	2,229
Corporate & Other (C&O)	(1,024)	(212)	(552)
Total net revenues	27,090	25,512	24,236
Provision for credit losses	1,243	557	1,763
Noninterest expenses:			
Compensation and benefits	10,652	10,290	10,303
General and administrative expenses	8,864	9,515	8,485
Impairment of goodwill and other intangible assets	68	5	0
Restructuring activities	(116)	263	480
Total noninterest expenses	19,468	20,073	19,269
Noncontrolling interests	0	0	0
Profit (loss) before tax	6,379	4,882	3,203
Total assets (in € bn)	1,282	1,193	1,127
Loans (gross of allowance for loan losses, in € bn)	494	475	429
Employees (full-time equivalent)	84,736	82,702	84,187

Deutsche Bank Group

Deutsche Bank's Organization

Headquartered in Frankfurt am Main, Germany, Deutsche Bank is the largest bank in Germany and one of the largest financial institutions in the world, as measured by total assets of € 1,344 billion as of December 31, 2022. As of that date, the bank had 84,930 full-time equivalent internal employees and operated in 58 countries with 1,536 branches, of which 66% were located in Germany. The bank offers a wide variety of investment, financial and related products and services to private individuals, corporate entities and institutional clients around the world.

As of December 31, 2022, the bank was organized into the following segments:

- Corporate Bank
- Investment Bank
- Private Bank
- Asset Management
- Capital Release Unit
- Corporate & Other

The Group refers to Corporate Bank, Investment Bank, Private Bank, Asset Management and Corporate & Other as the Core Bank.

Having fulfilled its de-risking and cost reduction mandate from 2019 through the end of 2022, the Capital Release Unit will no longer be reported as a separate segment effective from the first quarter of 2023. The financial impact of the Capital Release Unit will be reported within the Corporate & Other segment. This change does not involve the transfer of assets to or from the Core businesses. Most of the remaining Capital Release Unit assets will roll off over time. These are mostly interest rate derivatives but also include the Polish FX mortgage portfolio and certain other FIC Sales & Trading and Equities assets. In line with that change, the Core Bank, which represents the Group excluding the Capital Release Unit, will cease to be reported as well, and from the first quarter of 2023 the Group will consist of the segments Corporate Bank, Investment Bank, Private Bank, Asset Management and Corporate & Other.

In addition, Deutsche Bank has a country and regional organizational layer to facilitate a consistent implementation of global strategies.

The bank has operations or dealings with existing and potential customers in most countries in the world. These operations and dealings include working through:

- Subsidiaries and branches
- Representative offices
- One or more representatives assigned to serve customers

Capital expenditures or divestitures related to the divisions are included in the respective corporate division overview.

Management Structure

The Management Board has structured the Group as a matrix organization, comprising corporate divisions and infrastructure functions operating in legal entities and branches across geographic locations.

The Management Board is responsible for the management of the company in accordance with the law, the Articles of Association and the Terms of Reference for the Management Board with the objective of creating sustainable value in the interests of the company. It considers the interests of shareholders, employees and other company-related stakeholders. The Management Board manages Deutsche Bank Group in accordance with uniform guidelines; it exercises general control over all Group companies.

The Management Board decides on all matters prescribed by law and the Articles of Association and ensures compliance with the legal requirements and internal guidelines (compliance). It also takes the necessary measures to ensure that adequate internal guidelines are developed and implemented. The Management Board's responsibilities include, in particular, the bank's strategic management and direction, the allocation of resources, financial accounting and reporting, control and risk management, as well as corporate control and a properly functioning business organization. The members of the Management Board are collectively responsible for managing the bank's business.

The allocation of functional responsibilities to the individual members of the Management Board is described in the Business Allocation Plan for the Management Board, which sets the framework for the delegation of responsibilities to senior management below the Management Board. The Management Board endorses individual accountability of senior position holders as opposed to joint decision-taking in committees. At the same time, the Management Board recognizes the importance of having comprehensive and robust information across all businesses in order to take well informed decisions and established, the "Group Management Committee" which aims to improve the information flow across the corporate divisions and between the corporate divisions and the Management Board along with the Infrastructure Committees, Business Executive Committees and Regional Committees. The Group Management Committee is a senior platform, which is not required by the German Stock Corporation Act, and is composed of all Management Board members, and the most senior business representatives to exchange information and discuss business, growth and profitability.

Corporate Bank

Corporate Division Overview

Corporate Bank is primarily focused on serving corporate clients, including the German "Mittelstand", larger and smaller sized commercial and business banking clients in Germany as well as multinational companies. It is also a partner to financial institutions with regards to certain Transaction Banking services.

Commencing from the first quarter of 2021, Corporate Bank reports revenues based on three client categories: Institutional Client Services, Corporate Treasury Services and Business Banking. Institutional Client Services comprises of Cash Management for Institutional clients, Trust and Agency Services, as well as Securities Services. Corporate Treasury Services provides the full suite of Trade Finance and Lending, as well as Corporate Cash Management for multinational and German large and mid-sized corporate clients. Business Banking covers small corporates and entrepreneur clients in Germany and offers a holistic, largely standardized product suite.

There have been no significant capital expenditures or divestitures since January 1, 2020.

Products and Services

Corporate Bank is a global provider of risk management solutions, cash management, lending, trade finance, trust and agency services as well as securities services. Cash management services include integrated payments and FX solutions. Trade finance and lending offering spans from documentary and guarantee business to structured trade finance and lending. Trust and agency services cover depository receipts, corporate trust and document custody. Focusing on the finance departments of corporate and commercial clients and financial institutions in Germany and across the globe, its holistic expertise and global network allows the bank to offer integrated solutions.

In addition to Corporate Bank's product suite, coverage teams provide clients with access to the expertise of Investment Bank.

Distribution Channels and Marketing

The global coverage function of Corporate Bank focuses on international large corporate clients and is organized into two units: Coverage and Risk Management Solutions. Coverage includes multi-product generalists covering headquarter level and subsidiaries via global, regional and local coverage teams. Risk Management Solutions includes Foreign Exchange, Emerging Markets and Rates product specialists. This unit is managed regionally in APAC, Americas and EMEA to ensure close connectivity to clients.

Corporate clients in Germany are served out of two units: Corporate Treasury Services and Business Banking. Corporate Treasury Services covers mid and large corporate clients across two brands, Deutsche Bank and Postbank, and offers the whole range of solutions across cash, trade financing, lending and risk management for the corporate treasurer. Business Banking covers small corporates and entrepreneur clients and offers a largely standardized product suite and selected contextual-banking partner offerings (e.g. accounting solutions).

Investment Bank

Corporate Division Overview

Investment Bank combines Deutsche Bank's Fixed Income & Currencies (FIC) Sales & Trading and Origination & Advisory businesses, as well as Deutsche Bank Research. It focuses on its traditional strengths in these markets, bringing together wholesale banking expertise across risk management, sales and trading, investment banking and infrastructure. This enables the Investment Bank to align resourcing and capital across its client and product perimeter to effectively support the banks strategic goals.

There have been no significant capital expenditures or divestitures since January 1, 2020.

Products and Services

FIC Sales & Trading brings together institutional sales, trading and structuring expertise across Foreign Exchange, Rates, Emerging markets, Credit trading and Financing. The FIC Sales & Trading business operates globally and provides both corporate and institutional clients liquidity, market making services and a range of specialized risk management solutions across a broad range of FIC products, complemented by a comprehensive financing offering. The application of technology and continued innovation of transaction lifecycle processes is enabling Deutsche Bank to increase automation / electrification in order to respond to all client and regulatory requirements.

Origination & Advisory is responsible for the division's debt origination business, mergers and acquisitions, and a focused equity advisory and origination platform. It is comprised of regional and industry-focused coverage teams, co-led from the bank's hubs in Europe, the U.S. and Asia Pacific. This facilitates the delivery of a range of financial products and services to the bank's corporate clients.

Distribution Channels and Marketing

Coverage of the Investment Bank's clients is provided principally by three groups working in conjunction with each other: The Institutional Client Group, which houses its debt sales team. Risk Management Solutions in Corporate Bank, which covers capital markets and treasury solutions and Investment Banking Coverage within Origination & Advisory. The close cooperation between these groups help to create enhanced synergies leading to increased cross selling of products/solutions to clients.

Private Bank

Corporate Division Overview

Private Bank serves personal and private clients, wealthy individuals, entrepreneurs and families. The international businesses also focus on commercial clients. Private Bank is organized along the businesses Private Bank Germany and International Private Bank.

Private Bank was involved in the following significant capital divestitures since January 1, 2020:

In November 2020, Deutsche Bank signed an agreement to sell its share in Postbank Systems AG to Tata Consultancy Services. The transaction was closed after regulatory and governmental approvals on December 31, 2020.

In August 2021, Deutsche Bank SpA signed an agreement to sell its Deutsche Bank Financial Advisors business in Italy to Zurich Insurance Group (Zurich Italy). The transaction was closed after regulatory approval on October 17, 2022.

There have been no significant capital expenditures since January 1, 2020.

Products and Services

Private Bank's product range includes payment and account services, credit and deposit products as well as investment advice. These product offerings include a range of ESG products, which enable clients to access ESG-compliant lending and investment products in line with the values and according to specified ESG strategies, scores and exclusionary criteria.

Private Bank Germany pursues a differentiated, customer-focused approach with two strong and complementary main brands: Deutsche Bank and Postbank. With the Deutsche Bank brand, the business focuses on providing their private customers with banking and financial products and services that include sophisticated and individual advisory solutions. The focus of Postbank brand is on providing its retail customers with standard products and daily retail banking services supported by direct banking capabilities. In cooperation with Deutsche Post DHL AG, Private Bank Germany also offers postal and parcel services in the Postbank brand branches.

International Private Bank also has a differentiated, customer-focused approach with two client segments, "Premium Banking" and "Wealth Management & Bank for Entrepreneurs". International Private Bank provides its clients with banking and other financial services including support in planning, managing and investing wealth, financing personal and business interests and servicing institutional and corporate needs.

By year end 2022 International Private Bank materially completed the wind-down of the majority of legacy assets and liabilities associated with Sal. Oppenheim. Remaining assets or liabilities are not expected to have material financial impacts going forward and will be included in the normal course of the client segment Wealth Management & Bank for Entrepreneurs. The associated disclosure of "specific revenues items" will be discontinued starting in the first quarter 2023.

Distribution Channels and Marketing

Private Bank pursues an omni-channel approach and customers can flexibly choose between different possibilities to access services and products.

The distribution channels include branch networks in Private Bank Germany and International Private Bank, supported by advisory and customer call centers, self-service terminals as well as digital offerings including online and mobile banking. Private Bank also has collaborations with self-employed financial advisors and other sales and cooperation partners, including various cooperations with Business-to-Business-to-Consumer partners in Germany. For the Wealth Management & Bank for Entrepreneurs client segment, International Private Bank has a distinct client coverage team approach with relationship and investment managers supported by client service executives assisting clients with wealth management services and open-architecture products. In addition, in Germany, Deutsche Oppenheim Family Offices AG provides family office services, discretionary funds and advisory solutions.

The expansion of digital capabilities remains a strong focus across the businesses as a significant change in client behavior towards digital channels is observed. The Private Bank will continue to optimize the omni-channel mix in the future in order to provide customers with the most convenient access to products and services.

Asset Management

Corporate Division Overview

With € 821 billion of assets under management as of December 31, 2022, the Asset Management division, which operates under the brand DWS, aspires to be one of the world's leading asset management organizations. DWS serves a diverse client base of retail and institutional investors worldwide, with a strong presence in the bank's home market in Germany. These clients include government institutions, corporations and foundations as well as individual investors. As a regulated asset manager, DWS acts as a fiduciary for clients and is conscious of its societal impact. Responsible investing has been a key part of DWS's heritage for more than twenty years.

Deutsche Bank retains 79.49% ownership interest in DWS, and asset management remains a core business for the Group. The shares of DWS are listed on the Frankfurt stock exchange.

In 2022 DWS completed the transfer of its digital investment platform into a joint venture with Blackfin. DWS holds a 30% stake in the newly established company MorgenFund GmbH.

There have been no significant capital expenditures since January 1, 2020.

Products and Services

DWS offers individuals and institutions access to its investment capabilities across all major asset classes including active equity, fixed income, cash and multi asset and systematic and quantitative investments as well as passive including Xtrackers and alternative investments. The alternative investments include real estate, infrastructure, liquid real assets and sustainable investments. In addition, DWS's solution strategies are targeted to client needs that cannot be addressed by traditional asset classes alone. Such services include insurance and pension solutions, asset-liability management, portfolio management solutions and asset allocation advisory.

Distribution Channels and Marketing

DWS product offerings are distributed across EMEA (Europe, Middle East and Africa), the Americas and Asia Pacific through a global distribution network. DWS also leverages third-party distribution channels, including other divisions of Deutsche Bank Group.

Capital Release Unit

The Capital Release Unit was created in July 2019. Its principal objective is to liberate capital consumed by low return assets and businesses that earn insufficient returns or that are no longer core to the bank's strategy, by winding those down in an opportunistic manner. In addition, the Capital Release Unit is focused on reducing costs.

Having fulfilled its de-risking and cost reduction mandate from 2019 through the end of 2022, the Capital Release Unit will no longer be reported as a separate segment effective from the first quarter of 2023. The financial impact of the Capital Release Unit will be reported within the Corporate & Other segment. This change does not involve the transfer of assets to or from the Core businesses. Most of the remaining Capital Release Unit assets will roll off over time. These are mostly interest rate derivatives but also include the Polish FX mortgage portfolio and certain other FIC Sales & Trading and Equities assets.

The Capital Release Unit recorded the following significant capital divestiture since January 1, 2020:

In the fourth quarter of 2021, the Capital Release Unit concluded its transition of Deutsche Bank's Prime Finance and Electronic Equities platform to BNP Paribas resulting in the transfer of technology, clients and staff. This achievement marked the end of a two-year transition period, which formally commenced in the fourth quarter of 2019.

Infrastructure

The Infrastructure functions perform control and service activities for the businesses, including tasks relating to Group-wide, cross-divisional resource-planning, steering and control, as well as tasks relating to risk, liquidity and capital management.

The Infrastructure functions are organized into the following areas of responsibility linked to a dedicated member of the Management Board:

- Finance
- Risk
- Chief Administration Office which includes Legal, Business Selection and Conflicts Office, Compliance and Anti Financial Crime
- Technology, Data and Innovation
- Chief Transformation Office and Global Procurement

Infrastructure also includes Communications, Chief Sustainability Office, Regional Management, Human Resources, Global Real Estate and Group Audit which report to the Chief Executive Officer.

Costs originating in the Infrastructure functions are currently allocated to the corporate divisions based on the planned allocations, except for technology development costs which are charged to divisions based on actual expenditures.

As part of the focus on cost management and improving bank-wide efficiency, Deutsche Bank over the last few years has been rolling out driver-based cost management methodologies to allocate infrastructure costs to the businesses. The recent methodology rollout will be effective from the first quarter of 2023 and aims to provide greater transparency over the drivers of infrastructure costs and links costs more closely to service consumption. While the Group's cost/income ratio and return on tangible equity metrics will be unaffected by the change in internal allocations, the respective divisional metrics will change going forward.

Significant Capital Expenditures and Divestitures

Information on each Corporate Division's significant capital expenditures and divestitures for the last three financial years has been included in the above descriptions of the Corporate Divisions.

Since January 1, 2020, there have been no public takeover offers by third parties with respect to the Group's shares and the bank has not made any public takeover offers for its own account in respect of any other company's shares.

Results of Operations

Consolidated Results of Operations

You should read the following discussion and analysis in conjunction with the consolidated financial statements.

Condensed Consolidated Statement of Income

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net interest income	13,983	11,117	11,548	2,866	26	(431)	(4)
Provision for credit losses	1,226	515	1,792	710	138	(1,276)	(71)
Net interest income after provision for credit losses	12,757	10,602	9,756	2,155	20	846	9
Commissions and fee income ¹	9,838	10,934	9,424	(1,096)	(10)	1,510	16
Net gains (losses) on financial assets/liabilities at fair value through profit or loss ¹	2,962	3,139	2,332	(177)	(6)	807	35
Net gains (losses) on financial assets at fair value through other comprehensive income	(216)	237	323	(453)	N/M	(86)	(27)
Net gains (losses) on financial assets at amortized cost	(2)	1	311	(3)	N/M	(311)	(100)
Net income (loss) from equity method investments	152	98	120	54	56	(23)	(19)
Other income (loss)	346	13	(48)	333	N/M	62	N/M
Total noninterest income	13,080	14,421	12,463	(1,341)	(9)	1,958	16
Total net revenues²	25,837	25,023	22,219	814	3	2,804	13
Compensation and benefits	10,712	10,418	10,471	294	3	(53)	(1)
General and administrative expenses	9,728	10,821	10,259	(1,093)	(10)	561	5
Impairment of goodwill and other intangible assets	68	5	0	64	N/M	4	N/M
Restructuring activities	(118)	261	485	(379)	N/M	(224)	(46)
Total noninterest expenses	20,390	21,505	21,216	(1,115)	(5)	289	1
Profit (loss) before tax	5,447	3,518	1,003	1,929	55	2,515	N/M
Income tax expense (benefit)	(107)	923	391	(1,030)	N/M	532	136
Profit (loss)	5,554	2,595	612	2,959	114	1,983	N/M
Profit (loss) attributable to noncontrolling interests	134	144	129	(10)	(7)	15	12
Profit (loss) attributable to Deutsche Bank shareholders and additional equity components	5,420	2,451	483	2,969	121	1,968	N/M
Profit (loss) attributable to additional equity components	500	426	382	74	17	44	12
Profit (loss) attributable to Deutsche Bank shareholders	4,919	2,025	101	2,895	143	1,923	N/M

N/M – Not meaningful

¹ For further detail please refer to Note 1 "Significant Accounting Policies and Critical Accounting Estimates" of this annual report

² After provision for credit losses

Net Interest Income

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Total interest and similar income	24,449	16,773	17,954	7,677	46	(1,181)	(7)
Total interest expenses	10,466	5,655	6,405	4,811	85	(750)	(12)
Net interest income	13,983	11,117	11,548	2,866	26	(431)	(4)
Average interest-earning assets ¹	987,124	938,269	920,259	48,855	5	18,011	2
Average interest-bearing liabilities ¹	727,265	690,742	685,772	36,523	5	4,970	1
Gross interest yield ²	2.33 %	1.57 %	1.83 %	0.76 ppt	48	(0.26) ppt	(14)
Gross interest rate paid ³	1.24 %	0.53 %	0.78 %	0.72 ppt	135	(0.25) ppt	(32)
Net interest spread ⁴	1.09 %	1.05 %	1.06 %	0.04 ppt	4	(0.01) ppt	(1)
Net interest margin ⁵	1.42 %	1.18 %	1.25 %	0.23 ppt	20	(0.07) ppt	(6)

ppt – Percentage points

¹ Average balances for each year are calculated in general based upon month-end balances

² Gross interest yield is the average interest rate earned on average interest-earning assets

³ Gross interest rate paid is the average interest rate paid on average interest-bearing liabilities

⁴ Net interest spread is the difference between the average interest rate earned on average interest-earning assets and the average interest rate paid on average interest-bearing liabilities

⁵ Net interest margin is net interest income expressed as a percentage of average interest-earning assets

2022

Net interest income was € 14.0 billion in 2022 compared to € 11.1 billion in 2021, an increase of € 2.9 billion, or 26%, driven by higher interest rates and strong underlying business performance partly offset by lower benefits from the Targeted Longer-Term Refinancing Operations III (TLTRO III) program. Interest income included € 211 million related to EU government grants under the TLTRO III program in 2022, whereas 2021 included € 494 million under this program. Overall, the bank's net interest margin was 1.42% in 2022, an increase of 23 basis points compared to the prior year.

2021

Net interest income was € 11.1 billion in 2021 compared to € 11.5 billion in 2020, a decrease of € 431 million, or 4%, as the negative effects from interest rate headwinds were in part offset by increased interest income from business growth as well as higher benefits from deposit repricing and the TLTRO III program. Interest income included € 494 million related to EU government grants under the TLTRO III program in 2021, whereas 2020 included € 86 million under this program and € 43 million related to EU government grants under the TLTRO II program. Overall, the bank's net interest margin was 1.18% in 2021, a decline of 7 basis points compared to the prior year.

Net Gains (Losses) on Financial Assets/Liabilities at Fair Value through Profit or Loss

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Trading income	2,745	1,954	2,097	791	41	(143)	(7)
Net gains (losses) on non-trading financial assets mandatory at fair value through profit or loss	(61)	1,106	276	(1,167)	N/M	831	N/M
Net gains (losses) on financial assets/liabilities designated at fair value through profit or loss	277	79	(40)	198	N/M	119	N/M
Total net gains (losses) on financial assets/liabilities at fair value through profit or loss	2,962	3,139	2,332	(177)	(6)	807	35

N/M – Not meaningful

2022

Net gains on financial assets/liabilities at fair value through profit or loss were € 3.0 billion in 2022, compared to € 3.1 billion in 2021. The decrease of € 177 million, or 6%, was driven by negative impacts from interest rate hedges in Corporate & Other as well as an unfavorable change in the fair value of guarantees in Asset Management which had a corresponding offset in other income. The overall decrease was partly offset by positive mark-to-market impacts on derivatives in Investment Bank driven by the ongoing heightened market activity and strong client flows as well as mark-to-market gains from hedge activities in Private Bank which had a corresponding offsetting effect in other income.

2021

Net gains on financial assets/liabilities at fair value through profit or loss were € 3.1 billion in 2021, compared to € 2.3 billion in 2020. The increase of € 807 million, or 35%, was driven by a positive impact from interest rate hedges in Corporate & Other as well as a favorable change in the fair value of guarantees and an increase in mark-to-market valuation for illiquid products in Asset Management. The overall increase was partly offset by negative mark-to-market impacts on derivatives in Investment Bank reflecting more challenging market conditions compared to a very favorable trading environment in 2020.

Net Interest Income and Net Gains (Losses) on Financial Assets/Liabilities at Fair Value through Profit or Loss

The bank's trading and risk management activities include interest rate instruments and related derivatives. Under IFRS, interest and similar income earned from trading instruments and financial instruments designated at fair value through profit or loss (i.e., coupon and dividend income) and the costs of funding net trading positions are part of net interest income. The bank's trading activities can periodically shift income between net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss depending on a variety of factors, including risk management strategies.

In order to provide a more business-focused discussion, the following table presents net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss by corporate division.

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net interest income	13,983	11,117	11,548	2,866	26	(431)	(4)
Total net gains (losses) on financial assets/liabilities at fair value through profit or loss	2,962	3,139	2,332	(177)	(6)	807	35
Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss	16,945	14,256	13,880	2,689	19	376	3
Breakdown by Corporate Division:¹							
Corporate Bank	3,720	2,666	2,939	1,055	40	(273)	(9)
Investment Bank	8,265	6,891	7,193	1,374	20	(302)	(4)
Private Bank	6,612	4,847	4,648	1,765	36	198	4
Asset Management	(250)	246	(98)	(496)	N/M	345	N/M
Capital Release Unit	(61)	(18)	(33)	(43)	N/M	15	(45)
Corporate & Other	(1,342)	(375)	(768)	(966)	N/M	393	(51)
Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss	16,945	14,256	13,880	2,689	19	376	3

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year

¹ This breakdown reflects net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss only; for a discussion of the corporate divisions' total revenues by product please refer to Note 4 "Business Segments and Related Information"

2022

Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss were € 16.9 billion in 2022, compared to € 14.3 billion in 2021, an increase of € 2.7 billion. This was primarily due to higher net interest income driven by an improved interest rate environment and solid underlying business performance. Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss increased by € 1.8 billion in Private Bank. This impact was largely attributable to higher mark-to-market gains from hedge activities which had a corresponding offsetting effect in other income. Higher interest rates and continued business growth also had a positive impact on the year-on-year increase; these were also the main drivers for the increase in Corporate Bank by € 1.1 billion. Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss in Investment Bank increased by € 1.4 billion due to higher positive mark-to-market impacts on derivatives in FIC Sales & Trading driven by the ongoing heightened market activity and strong clients flows. These overall positive effects were partially offset by valuation and timing differences on derivatives in Corporate & Other and a less favorable change in the fair value of guarantees in Asset Management.

2021

Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss were € 14.3 billion in 2021, compared to € 13.9 billion in 2020, an increase of € 376 million. This was primarily due to a favorable change in fair value of guarantees, an increase in mark-to-market valuation for illiquid products and a favorable impact from the valuation of consolidated guaranteed mutual funds which has a corresponding offset in Other Income in Asset Management. The development further benefited from a positive impact from interest rate hedges in Corporate & Other. In Private Bank, net interest income increased including positive effects from business growth and higher benefits from TLTRO, partly offset by negative effects from interest rate headwinds. These overall positive effects were partially offset by negative mark-to-market impacts on derivatives in Investment Bank reflecting more challenging market conditions compared to a very favorable trading environment in 2020. Revenues in Corporate Bank also declined primarily as negative effects from interest rate headwinds more than offset the benefits from TLTRO, deposit re-pricing and business growth.

Provision for Credit Losses

2022

Provision for credit losses was € 1.2 billion in 2022, up from € 515 million in 2021. The year-on-year development reflected more challenging macro-economic conditions during most of 2022 against the backdrop of the war in Ukraine, while 2021 benefited from an economic recovery following the easing of COVID-19 restrictions. Provisions were 25 basis points of average loans. Provisions for non-performing loans related to Stage 3 was € 1.0 billion, spread across regions and segments. Stage 1 and Stage 2 provision for performing loans was € 204 million, driven by deteriorating macro-economic forecasts through most of the year.

2021

Provision for credit losses was € 515 million in 2021, a decrease of € 1.3 billion, or 71%, versus 2020, reflecting a supportive credit environment and a strong economic recovery due to the easing of COVID-19 related restrictions. The management overlay to reduce the weight of short-term forecasts in the standard model and base forward looking information on longer term averages during the height of the COVID-19 crisis was no longer applied in 2021. The lower level of provision for credit losses also included a positive effect from the release of a management overlay to account for uncertainties in the macro-economic outlook at the end of 2020 as the expected uncertainties did not materialize. This was partially offset by a new management overlay to address macro-economic variables outside the calibrated range of the IFRS 9 model. Provision for credit losses was 12 basis points of loans supported by strong balance sheet and disciplined risk management.

The sections “Segment Results of Operations” and “Risk Report” provide further details on provision for credit losses.

Remaining Noninterest Income

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Commissions and fee income ¹	9,838	10,934	9,424	(1,096)	(10)	1,510	16
Net gains (losses) on financial assets at fair value through other comprehensive income	(216)	237	323	(453)	N/M	(86)	(27)
Net gains (losses) on financial assets at amortized cost	(2)	1	311	(3)	N/M	(311)	(100)
Net income (loss) from equity method investments	152	98	120	54	56	(23)	(19)
Other income (loss)	346	13	(48)	333	N/M	62	N/M
Total remaining noninterest income	10,118	11,282	10,130	(1,164)	(10)	1,151	11
¹ includes:							
Commissions and fees from fiduciary activities:							
Commissions for administration	300	357	347	(57)	(16)	10	3
Commissions for assets under management	3,792	3,734	3,208	58	2	526	16
Commissions for other securities business	490	398	341	91	23	57	17
Total	4,582	4,489	3,896	92	2	594	15
Commissions, broker's fees, mark-ups on securities underwriting and other securities activities:							
Underwriting and advisory fees	1,283	2,162	1,625	(879)	(41)	537	33
Brokerage fees	540	752	637	(212)	(28)	115	18
Total	1,824	2,914	2,262	(1,091)	(37)	652	29
Fees for other customer services	3,432	3,530	3,266	(97)	(3)	264	8
Total commissions and fee income	9,838	10,934	9,424	(1,096)	(10)	1,510	16

N/M – Not meaningful
Prior year's comparatives aligned to presentation in the current year

Commissions and fee income

2022

Commissions and fee income was € 9.8 billion in 2022, a decrease of € 1.1 billion, or 10%, compared to 2021. The decrease was driven by significantly lower Origination & Advisory revenues in Investment Bank reflecting continued challenging industry environment, lower Leveraged Debt Capital Management revenues and a materially reduced fee pool relative to the previous year. In addition, commission and fee income in Private Bank declined reflecting a more challenging macroeconomic environment. In Asset Management performance fees were significantly lower than the previous year due to the absence of a large Multi Asset performance fee reported then. These were partly offset by an increase in commissions and fee income in Corporate Bank driven by solid underlying business performance.

2021

Commissions and fee income was € 10.9 billion in 2021, an increase of € 1.5 billion, or 16%, compared to 2020. The increase was driven by € 537 million higher underwriting and advisory fees due to strong growth in equity origination revenues from record Special Purpose Acquisition Company activity, significant growth in mergers and acquisition activity and higher volumes during the year. Commissions for assets under management increased by € 526 million due to higher management fees from favorable markets and net inflows combined with favorable effects from a Multi Asset performance fee as well as increased real estate performance and transaction fees in Asset Management. Fees for other customer services improved by € 264 million driven by strong performance in Leveraged Debt Capital Markets partly offset by a negative impact of € 154 million on revenues in Private Bank subsequent to the BGH ruling. Brokerage fees increased by € 115 million mainly driven by a significant increase in revenues from investment products in Private Bank.

Net gains (losses) on financial assets at fair value through other comprehensive income

2022

Net gains on financial assets at fair value through other comprehensive income were € (216) million in 2022 and € 237 million in 2021, with the result in both periods driven by the sale of bonds and securities from the strategic liquidity reserve.

2021

Net gains on financial assets at fair value through other comprehensive income were € 237 million in 2021, a decrease of € 86 million, or 27%, compared to 2020, driven by lower gains from sale of bonds and securities from strategic liquidity reserve.

Net gains (losses) on financial assets at amortized cost

2022

Net gains (losses) on financial assets at amortized cost were € (2) million in 2022 compared to € 1 million in 2021, driven by the hold-to-collect portfolio.

2021

Net gains (losses) on financial assets at amortized cost were € 1 million in 2021 compared to € 311 million in 2020, driven by the absence of a 2020 gain from sale of assets from the hold-to-collect portfolio.

Net income (loss) from equity method investments

2022

Net income from equity method investments was € 152 million in 2022 compared to € 98 million in 2021, an increase of € 54 million, or 56%, related to lower impairments for Huarong Rongde Asset Management Company Limited in 2022 as compared to 2021.

2021

Net income from equity method investments was € 98 million in 2021 compared to € 120 million in 2020, a decrease of € 23 million, or 19%, related to impairments for Huarong Rongde Asset Management Company Limited in 2021 as compared to nil impairment in 2020.

Other income (loss)

2022

Other income (loss) was € 346 million in 2022 compared to € 13 million in 2021. The improvement was driven by a favorable impact from valuation adjustments on fair value of guarantees in Asset Management which had a corresponding offsetting effect in net gains (losses) on financial assets/liabilities at fair value through profit or loss as well as by gains on disposal of assets held for sale, including the sale of the Deutsche Bank Financial Advisors business in Italy. This was partly offset by a decrease in income in Private Bank driven by the countereffect of the aforementioned positive impacts in net gains (losses) on financial assets/liabilities at fair value through profit or loss.

2021

Other income (loss) was € 13 million in 2021 compared to € (48) million in 2020. The improvement was driven by positive impacts associated with fair value hedge accounting adjustments. Further, favorable year-on-year movements in the Capital Release Unit were driven by lower de-risking impacts. This was partly offset by a negative impact from valuation adjustments on liabilities of guaranteed mutual funds in Asset Management that offsets the aforementioned positive impact in net gains (losses) on financial assets/liabilities at fair value through profit or loss.

Noninterest Expenses

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Compensation and benefits	10,712	10,418	10,471	294	3	(53)	(1)
General and administrative expenses ¹	9,728	10,821	10,259	(1,093)	(10)	561	5
Impairment of goodwill and other intangible assets	68	5	0	64	N/M	4	N/M
Restructuring activities	(118)	261	485	(379)	N/M	(224)	(46)
Total noninterest expenses	20,390	21,505	21,216	(1,115)	(5)	289	1
N/M – Not meaningful							

¹ includes:

Information Technology	3,680	4,321	3,862	(641)	(15)	459	12
Occupancy, furniture and equipment expenses	1,429	1,727	1,724	(298)	(17)	3	0
Regulatory, tax & insurance ²	1,285	1,395	1,407	(110)	(8)	(12)	(1)
Professional services ³	858	924	977	(66)	(7)	(53)	(5)
Banking Services and outsourced operations ³	881	946	967	(64)	(7)	(21)	(2)
Market Data and Research services	378	347	376	31	9	(28)	(8)
Travel expenses	110	46	76	64	140	(31)	(40)
Marketing expenses	165	178	174	(13)	(7)	3	2
Other expenses ⁴	943	938	697	5	0	241	35
Total general and administrative expenses	9,728	10,821	10,259	(1,093)	(10)	561	5

² Includes bank levy of € 762 million in 2022, € 553 million in 2021 and € 633 million in 2020

³ Prior years' comparatives aligned to presentation in the current year

⁴ Includes litigation related expenses of € 413 million in 2022, € 466 million in 2021 and € 158 million in 2020. See Note 27 "Provisions", for more detail on litigation

Compensation and benefits

2022

Compensation and benefits increased by € 294 million, or 3% to € 10.7 billion in 2022 compared to € 10.4 billion in 2021. The increase was primarily driven by adverse foreign exchange movements, with higher salary costs.

2021

Compensation and benefits decreased by € 53 million, or 1% to € 10.4 billion in 2021 compared to € 10.5 billion in 2020. The decrease was primarily driven by lower fixed compensation expenses resulting from workforce reductions offset by an increase in variable compensation costs.

General and administrative expenses

2022

General and administrative expenses decreased by € 1.1 billion, or 10%, to € 9.7 billion in 2022 compared to € 10.8 billion in 2021. The decrease was driven by a significant decline in transformation charges as the bank completed the transformation initiatives announced in 2019. Further reductions were across major cost categories, reflecting the bank's continued cost reduction efforts. Litigation expenses decreased by € 53 million, partly related to a provision release related to the BGH ruling on pricing arrangements. The declines were partly offset by a year-on-year rise in bank levies of € 210 million.

2021

General and administrative expenses increased by € 561 million, or 5%, to € 10.8 billion in 2021 compared to € 10.3 billion in 2020. The increase was driven by € 513 million higher transformation charges, which included increased information technology costs partly related to a contract settlement and software impairments, partly triggered by the bank's migration to cloud technology. Litigation expenses increased by € 308 million, partly related to the BGH ruling on pricing arrangements. Apart from these, general and administrative expenses decreased compared to the prior year with reductions across major cost categories including professional service fees as well as travel and market data and research expenses.

Impairment of goodwill and other intangible assets

2022

Impairment of goodwill and other intangible assets was € 68 million relating to a historic acquisition of an unamortized intangible asset associated with U.S mutual fund retail contracts in Asset Management in 2022, compared to € 5 million in the Corporate Bank in 2021.

2021

Impairment of goodwill and other intangible assets was € 5 million in the Corporate Bank in 2021. No impairment charges were reported for 2020.

Restructuring

2022

Restructuring activities were a release of € (118) million in 2022 compared to charges of € 261 million in 2021. The development in both periods was primarily driven by Private Bank in the context of the execution of strategic objectives.

2021

Expenses for restructuring activities were € 261 million in 2021 compared to € 485 million in 2020. The decrease was primarily due to lower restructuring costs in Private Bank.

Income Tax Expense

2022

Income tax benefit in 2022 was € 107 million compared to an income tax expense of € 923 million in 2021. The effective tax rate in 2022 of (2)% benefited from a positive deferred tax asset valuation adjustment of € 1.4 billion, reflecting continued strong performance in Deutsche Bank's U.S. operations.

2021

Income tax expense in 2021 was € 923 million compared to € 391 million in 2020. The effective tax rate in 2021 of 26% benefited from a positive deferred tax asset valuation adjustment of € 274 million related to the strong U.S. performance in 2021.

Net profit (loss)

2022

Net profit in 2022 was € 5.6 billion, compared to € 2.6 billion in the prior year. The increase in net profit was primarily driven by strong revenue performance across core businesses, reduced noninterest expenses and the aforementioned tax benefit from a deferred tax asset valuation adjustment. Partly offsetting was an increase in provision for credit losses.

2021

Net profit in 2021 was € 2.6 billion, compared to € 612 million in the prior year. The increase in net profit was primarily driven by higher revenues across core businesses and reduced levels of provision for credit losses largely due to favorable credit environment and high-quality loan book. This was partly offset by a slight increase in noninterest expenses.

Segment Results of Operations

The following is a discussion of the results of the business segments. See Note 4 "Business Segments and Related Information" to the consolidated financial statements for information regarding:

- Changes in the format of the bank's segment disclosure
- The framework of the bank's management reporting systems

The Group's segment reporting follows the organizational structure as reflected in its internal management reporting systems, which are the basis for assessing the financial performance of the business segments and for allocating resources to the business segments. The criterion for segmentation into divisions is the bank's organizational structure as it existed at December 31, 2022. Prior years comparatives aligned to presentation in the current year.

	2022						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Net revenues¹	6,335	10,016	9,155	2,608	(28)	(1,024)	27,063
Provision for credit losses	335	319	583	(2)	(17)	8	1,226
Noninterest expenses							
Compensation and benefits	1,421	2,376	2,791	899	60	3,165	10,712
General and administrative expenses	2,547	3,805	3,915	869	864	(2,272)	9,728
Impairment of goodwill and other intangible assets	0	0	0	68	0	0	68
Restructuring activities	(19)	15	(113)	0	(2)	0	(118)
Total noninterest expenses	3,949	6,196	6,593	1,836	922	893	20,390
Noncontrolling interests	0	15	0	174	0	(190)	0
Profit (loss) before tax	2,051	3,487	1,979	598	(932)	(1,736)	5,447
Cost/income ratio	62%	62%	72%	70%	N/M	N/M	75%
Assets²	257,900	676,714	332,524	10,150	61,823	5,107	1,344,217
Additions to non-current assets	3	4	177	41	0	2,269	2,494
Risk-weighted assets	74,303	139,442	87,602	12,864	24,284	21,508	360,003
Leverage exposure ³	320,767	529,506	344,396	9,462	22,028	14,325	1,240,483
Average allocated shareholders' equity	11,901	26,032	13,584	5,459	3,018	115	60,108
Post-tax return on average shareholders' equity ⁴	12 %	9 %	10 %	7 %	(23) %	N/M	8 %
Post-tax return on average tangible shareholders' equity ⁴	12 %	9 %	11 %	17 %	(24) %	N/M	9 %
¹ includes:							
Net interest income	3,628	3,467	5,223	(65)	(227)	1,958	13,983
Net income (loss) from equity method investments	4	50	27	66	6	0	152
² includes:							
Equity method investments	90	501	99	415	16	4	1,124

N/M – Not meaningful

³ The leverage ratio exposure is calculated according to CRR as applicable at the reporting date; starting with September 30, 2020, the Group was allowed to exclude certain Euro-based exposures facing Eurosystem central banks from the leverage ratio exposure based on the ECB-decision (EU) 2020/1306 and EU 2021/1074; this exclusion applied until March 31, 2022; the segmental leverage exposures are presented without that exclusion

⁴ The post-tax return on average tangible shareholders' equity and average shareholders' equity at the Group level reflects the reported effective tax rate for the Group, which was (2)% for the year ended December 31, 2022; for the post-tax return on average tangible shareholders' equity and average shareholders' equity of the segments, the Group effective tax rate was adjusted to exclude the impact of permanent differences not attributed to the segments, so that the segment tax rates were 28% for the year ended December 31, 2022; for further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this Annual Report

	2021						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Net revenues¹	5,151	9,631	8,234	2,708	26	(212)	25,538
Provision for credit losses	(3)	104	446	5	(42)	5	515
Noninterest expenses							
Compensation and benefits	1,447	2,197	2,813	822	128	3,012	10,418
General and administrative expenses	2,649	3,587	4,447	840	1,306	(2,009)	10,821
Impairment of goodwill and other intangible assets	5	0	0	0	0	0	5
Restructuring activities	42	47	173	2	(2)	(0)	261
Total noninterest expenses	4,143	5,831	7,433	1,664	1,432	1,002	21,505
Noncontrolling interests	0	(17)	0	223	0	(206)	0
Profit (loss) before tax	1,011	3,714	355	816	(1,364)	(1,014)	3,518
Cost/income ratio	80 %	61 %	90 %	61 %	N/M	N/M	84 %
Assets ²	245,716	615,906	310,496	10,387	131,775	10,425	1,324,705
Additions to non-current assets	17	6	149	32	1	1,734	1,939
Risk-weighted assets	65,406	140,600	85,366	14,415	28,059	17,783	351,629
Leverage exposure (fully loaded) ³	299,892	530,361	320,692	10,678	38,830	22,761	1,124,667
Average allocated shareholders' equity	10,301	24,181	12,663	4,815	4,473	104	56,537
Post-tax return on average shareholders' equity ⁴	6 %	10 %	1 %	12 %	(23) %	N/M	4 %
Post-tax return on average tangible shareholders' equity ⁴	7 %	11 %	1 %	30 %	(23) %	N/M	4 %
¹ includes:							
Net interest income	2,605	3,332	4,601	(5)	58	526	11,117
Net income (loss) from equity method investments	3	(34)	40	81	7	1	98
² includes:							
Equity method investments	72	462	180	349	25	4	1,091

N/M – Not meaningful

Prior years comparatives aligned to presentation in the current year

³ The leverage ratio exposure is calculated according to CRR as applicable at the reporting date; starting with September 30, 2020, the Group was allowed to exclude certain Euro-based exposures facing Eurosystem central banks from the leverage ratio exposure based on the ECB-decision (EU) 2020/1306 and EU 2021/1074; this exclusion applied until March 31, 2022; the segmental leverage exposures are presented without that exclusion

⁴ The post-tax return on average tangible shareholders' equity and average shareholders' equity at the Group level reflects the reported effective tax rate for the Group, which was 26% for the year ended December 31, 2021; for the post-tax return on average tangible shareholders' equity and average shareholders' equity of the segments, the Group effective tax rate was adjusted to exclude the impact of permanent differences not attributed to the segments, so that the segment tax rates were 28% for the year ended December 31, 2021; for further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this Annual Report

	2020						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Net revenues¹	5,146	9,286	8,126	2,229	(225)	(552)	24,011
Provision for credit losses	364	690	711	2	29	(4)	1,792
Noninterest expenses							
Compensation and benefits	1,402	2,079	2,867	740	168	3,215	10,471
General and administrative expenses	2,805	3,325	4,242	763	1,774	(2,651)	10,259
Impairment of goodwill and other intangible assets	0	0	0	0	0	0	0
Restructuring activities	28	14	413	22	5	3	485
Total noninterest expenses	4,235	5,418	7,522	1,526	1,947	568	21,216
Noncontrolling interests	0	11	0	157	(0)	(169)	0
Profit (loss) before tax	547	3,166	(108)	544	(2,200)	(947)	1,003
Cost/income ratio	82 %	58 %	93 %	68 %	N/M	N/M	88 %
Assets²	237,675	573,536	296,596	9,453	197,667	10,035	1,324,961
Additions to non-current assets	10	4	202	32	0	3,174	3,423
Risk-weighted assets	57,483	128,292	77,074	9,997	34,415	21,690	328,951
Leverage exposure (fully loaded) ³	273,959	476,097	307,746	4,695	71,726	29,243	1,078,268
Average allocated shareholders' equity	9,945	22,911	11,553	4,757	6,166	(23)	55,308
Post-tax return on average shareholders' equity ⁴	3 %	9 %	(1) %	8 %	(26) %	N/M	0 %
Post-tax return on average tangible shareholders' equity ⁴	3 %	10 %	(2) %	21 %	(27) %	N/M	0 %
¹ includes:							
Net interest income	2,883	3,325	4,499	1	61	779	11,548
Net income (loss) from equity method investments	3	22	23	63	9	1	120
² includes:							
Equity method investments	69	399	60	304	67	4	901

N/M – Not meaningful

Prior years comparatives aligned to presentation in the current year

³ The leverage ratio exposure is calculated according to CRR as applicable at the reporting date; starting with September 30, 2020, the Group was allowed to exclude certain Euro-based exposures facing Eurosystem central banks from the leverage ratio exposure based on the ECB-decision (EU) 2020/1306 and EU 2021/1074; this exclusion applied until March 31, 2022; the segmental leverage exposures are presented without that exclusion

⁴ The post-tax return on average tangible shareholders' equity and average shareholders' equity at the Group level reflects the reported effective tax rate for the Group, which was 39 % for the year ended December 31, 2020; for the post-tax return on average tangible shareholders' equity and average shareholders' equity of the segments, the Group effective tax rate was adjusted to exclude the impact of permanent differences not attributed to the segments, so that the segment tax rates were 28 % for the year ended December 31, 2020; for further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this Annual Report

Corporate Bank

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues							
Corporate Treasury Services	3,886	3,125	3,119	761	24	6	0
Institutional Client Services	1,586	1,299	1,280	287	22	19	1
Business Banking	863	726	747	136	19	(21)	(3)
Total net revenues	6,335	5,151	5,146	1,185	23	5	0
of which:							
Net interest income	3,628	2,605	2,883	1,022	39	(278)	(10)
Commissions and fee income	2,354	2,203	2,078	151	7	125	6
Remaining income	354	343	185	11	3	158	86
Provision for credit losses	335	(3)	364	338	N/M	(367)	N/M
Noninterest expenses							
Compensation and benefits	1,421	1,447	1,402	(25)	(2)	45	3
General and administrative expenses	2,547	2,649	2,805	(103)	(4)	(156)	(6)
Impairment of goodwill and other intangible assets	0	5	0	(5)	N/M	5	N/M
Restructuring activities	(19)	42	28	(61)	N/M	13	47
Total noninterest expenses	3,949	4,143	4,235	(193)	(5)	(92)	(2)
Noncontrolling interests	0	0	0	0	N/M	0	N/M
Profit (loss) before tax	2,051	1,011	547	1,040	103	464	85
Total assets (in € bn.) ¹	258	246	238	12	5	8	3
Loans (gross of allowance for loan losses, in € bn.)	122	122	115	(1)	(1)	8	7
Total employees (directly-managed, full-time equivalent)	13,980	13,292	13,393	688	5	(102)	(1)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances

2022

Profit before tax of the Corporate Bank was € 2.1 billion for the full year 2022, up from € 1.0 billion in 2021, driven by higher revenues and lower noninterest expenses, partly offset by increased provision for credit losses. Adjusted for transformation charges, restructuring and severance expenses, impairments of goodwill and other intangible assets and specific revenue items, profit before tax was also € 2.1 billion, 74% above the prior year. Post-tax return on average tangible shareholders' equity was 12.5%, up from 6.8% in the prior year. Post-tax return on average shareholders' equity was 11.6%, up from 6.3% in the prior year. The cost/income ratio was 62%, down from 80% in 2021.

Full year net revenues were € 6.3 billion, 23% higher year on year. Revenue growth was driven by increased interest rates and continued pricing discipline, higher commission and fee income as well as deposit growth and favorable foreign exchange rate movements. Deposits grew by € 18 billion, or 7%, during the year while loan volume decreased by € 1 billion, or 1%. All of the Corporate Bank's businesses contributed to revenue growth.

Corporate Treasury Services net revenues were € 3.9 billion, up 24% year on year, driven by increased interest rates across all markets, growth in commission and fee income and higher deposits. Institutional Client Services net revenues were € 1.6 billion, 22% higher year on year, benefitting from higher interest rates and favorable foreign exchange movements. Business Banking net revenues were € 863 million, 19% higher year on year, reflecting transition to a positive interest rate environment in Germany in the second half of 2022 and higher commission and fee income from account repricing.

Provision for credit losses increased to € 335 million in the year, or 27 basis points of average loans, from essentially nil in the prior year reflecting the weakened macroeconomic environment.

Noninterest expenses were € 3.9 billion, down 5% year on year, as a positive contribution from noncompensation initiatives and lower nonoperating costs, were partly offset by foreign exchange rate movements. Adjusted costs ex-transformation charges were € 3.9 billion, down 1%, reflecting the aforementioned noncompensation initiatives and foreign exchange movements.

2021

Profit before tax of the Corporate Bank was € 1.0 billion for the full year 2021, up from € 547 million in 2020, driven by a decrease in provision for credit losses as well as lower noninterest expenses. Adjusted for transformation charges, restructuring and severance expenses, impairments of goodwill and other intangible assets and specific revenue items, profit before tax was € 1.2 billion, 69% above the prior year. This increase was primarily driven by lower provision for credit losses, lower litigation charges as well as lower adjusted costs, partly offset by higher severance and restructuring.

Full year net revenues were € 5.2 billion, flat versus 2020, as business volume growth and deposit repricing offset interest rate headwinds.

Corporate Treasury Services revenues of € 3.1 billion were essentially unchanged compared to prior year, as the benefits of the deposit repricing, ECB's TLTRO III program and other business initiatives offset interest rate headwinds. Institutional Client Services net revenues of € 1.3 billion were € 19 million or 1% higher than prior year driven by underlying business performance. Business Banking net revenues of € 0.7 billion decreased by 3%, as interest rate headwinds more than offset business growth and progress on repricing agreements.

Provision for credit losses was a net release of € 3 million, compared to provisions of € 364 million in 2020, reflecting low levels of impairments and releases of Stage 1 and 2 provisions compared to the prior year.

Noninterest expenses were € 4.1 billion, down 2% year on year, partly reflecting a non-recurrence of litigation expenses in the prior year. Adjusted costs ex-transformation charges were € 4.0 billion, down 1%, driven by headcount reduction and other initiatives. Severance and restructuring expenses rose 42% year on year, reflecting headcount reductions in support of the bank's transformation program.

Investment Bank

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues							
Fixed Income, Currency (FIC) Sales & Trading	8,935	7,063	7,074	1,871	26	(11)	(0)
Debt Origination	412	1,573	1,500	(1,161)	(74)	73	5
Equity Origination	101	544	369	(443)	(81)	174	47
Advisory	485	491	244	(6)	(1)	247	101
Origination & Advisory	998	2,608	2,114	(1,610)	(62)	494	23
Other	84	(40)	99	124	N/M	(139)	N/M
Total net revenues	10,016	9,631	9,286	385	4	345	4
Provision for credit losses	319	104	690	215	N/M	(587)	(85)
Noninterest expenses							
Compensation and benefits	2,376	2,197	2,079	179	8	118	6
General and administrative expenses	3,805	3,587	3,325	218	6	262	8
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	15	47	14	(32)	(68)	33	N/M
Total noninterest expenses	6,196	5,831	5,418	365	6	413	8
Noncontrolling interests	15	(17)	11	32	N/M	(29)	N/M
Profit (loss) before tax	3,487	3,714	3,166	(227)	(6)	547	17
Total assets (in € bn.) ¹	677	616	574	61	10	42	7
Loans (gross of allowance for loan losses, in € bn.)	103	93	69	10	11	24	34
Total employees (directly-managed, full-time equivalent)	7,657	7,152	7,492	505	7	(341)	(5)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances

2022

Profit before tax was € 3.5 billion in 2022, a decrease of € 227 million versus a very strong prior year. Slightly higher revenues were more than offset by significantly higher provision for credit losses and slightly higher noninterest expenses.

Net revenues were € 10.0 billion in 2022, an increase of € 385 million, or 4% compared to 2021.

Revenues in FIC Sales & Trading were € 8.9 billion, an increase of € 1.9 billion, or 26%, versus the prior year, with strong year-on-year growth across the majority of the franchise. Rates, Foreign Exchange and Emerging Markets revenues were all significantly higher, reflecting heightened levels of market activity, increased client flows and disciplined risk management. Financing revenues were higher, driven primarily by higher net interest income, as a result of increased lending activity. Revenues in Credit Trading were significantly lower due to the non-recurrence of the contribution from a concentrated distressed credit position in the prior year and a challenging market environment.

Origination & Advisory net revenues were € 1.0 billion, a decrease of € 1.6 billion, or 62%, compared to the prior year. Debt Origination revenues were € 412 million, significantly lower than the prior year driven principally by Leveraged Debt Capital Markets, where revenues were impacted by a material decline in the industry fee pool and loan markdowns, which were seen across the industry. Investment Grade debt revenues were also lower, however decreased by less than the industry average (source: Dealogic). Equity Origination revenues of € 101 million were significantly lower, reflecting a material decline in primary equity issuance during the year. Advisory revenues of € 485 million were essentially flat to 2021, in a fee pool that was down approximately 15% (source: Dealogic).

Other revenues were positive € 84 million, compared to negative € 40 million in 2021. The year-on-year increase was materially driven by a gain of € 49 million relating to the impact of debt valuation adjustments (DVA) on certain derivative liabilities versus a loss of € 28 million in 2021. Additionally, 2021 was negatively impacted by the reversal of previously recorded Collateralized Loan Obligation hedge gains, which had resulted from the release of underlying provisions for credit losses. These did not re-occur in 2022.

Provision for credit losses was € 319 million or 32 basis points of average loans, an increase of € 215 million primarily driven by a weakened macroeconomic environment whilst the prior year benefitted from a post COVID-19 recovery.

Noninterest expenses in 2022 were € 6.2 billion, an increase of € 365 million or 6% compared to the prior year, reflecting the impact of foreign exchange translation and increased bank levies.

2021

Profit before tax was € 3.7 billion in 2021, an increase of € 547 million compared to the prior year. The increase was mainly driven by slightly higher revenues, as well as significantly lower provision for credit losses, partly offset by higher noninterest expenses.

Net revenues were € 9.6 billion in 2021, an increase of € 345 million or 4% compared to 2020.

Revenues in FIC Sales & Trading were € 7.1 billion, essentially flat versus the prior year. Financing revenues were significantly higher, driven by increased net interest income, as a result of increased lending activity, with solid performance across all businesses. Revenues in Credit Trading were significantly higher due to strength in the distressed business. Rates and Foreign Exchange revenues were significantly lower, reflecting more challenging market conditions compared to a more favorable trading environment in 2020. Revenues in Emerging Markets were lower due to a decline in Asia, which did not benefit from the heightened levels of activity seen in 2020. This was partially offset by growth in the Central and Eastern Europe, Middle East and Africa region, with Latin America broadly flat.

Origination and Advisory net revenues were € 2.6 billion, a € 494 million or 23% increase compared to the prior year. Debt Origination revenues were € 1.6 billion, slightly higher than the prior year driven principally by strong performance in Leveraged Debt Capital Markets, which more than offset normalized Investment Grade debt issuances versus the prior year. Equity Origination revenues of € 544 million were significantly higher, reflecting record Special Purpose Acquisition Company (SPAC) activity in the first quarter and subsequent SPAC merger (de-SPAC) revenues through the year. Advisory revenues of € 491 million were significantly higher reflecting the growth in M&A activity and record announced volumes during the year.

Other revenues were negative € 40 million, compared to positive € 99 million in 2020. The year-on-year decrease was materially driven by a reversal of previously recorded Collateralized Loan Obligation hedge gains, resulting from the release of underlying provisions for credit losses, with an overall net neutral impact to profit before tax.

Provision for credit losses was € 104 million or 14 basis points of average loans, with the decrease of € 587 million compared to 2020 primarily driven by the non-recurrence of COVID-19 related impairments.

Noninterest expenses in 2021 were € 5.8 billion, an increase of € 413 million or 8% compared to the prior year, reflecting higher compensation costs, increased bank levy and infrastructure service cost allocations.

Private Bank

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues:							
Private Bank Germany	5,327	5,008	4,989	319	6	19	0
International Private Bank	3,828	3,226	3,136	601	19	90	3
Premium Banking	953	945	905	8	1	41	4
Wealth Management & Bank for Entrepreneurs	2,874	2,281	2,232	594	26	49	2
Total net revenues	9,155	8,234	8,126	921	11	109	1
of which:							
Net interest income	5,223	4,601	4,499	622	14	102	2
Commissions and fee income	3,157	3,207	3,052	(50)	(2)	155	5
Remaining income	775	426	574	349	82	(148)	(26)
Provision for credit losses	583	446	711	137	31	(265)	(37)
Noninterest expenses:							
Compensation and benefits	2,791	2,813	2,867	(22)	(1)	(54)	(2)
General and administrative expenses	3,915	4,447	4,242	(533)	(12)	205	5
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	(113)	173	413	(285)	N/M	(240)	(58)
Total noninterest expenses	6,593	7,433	7,522	(840)	(11)	(89)	(1)
Noncontrolling interests	0	0	0	0	N/M	(0)	(87)
Profit (loss) before tax	1,979	355	(108)	1,624	N/M	463	N/M
Total assets (in € bn.) ¹	333	310	297	22	7	14	5
Loans (gross of allowance for loan losses, in € bn.)	265	254	237	10	4	17	7
Assets under management (in € bn.) ²	518	554	495	(36)	(6)	59	12
Net flows (in € bn.)	30	30	16	(0)	(1)	14	85
Total employees (directly-managed, full-time equivalent)	26,951	28,084	29,748	(1,132)	(4)	(1,665)	(6)

N/M – Not meaningful

Prior years comparatives aligned to presentation in the current year

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances

² The Group defines assets under management as (a) assets held on behalf of customers for investment purposes and/or (b) client assets that are managed by the bank; assets under management are managed on a discretionary or advisory basis, or these assets are deposited with the bank; deposits are considered assets under management if they serve investment purposes; in the Private Bank Germany and Premium Banking, this includes term deposits and savings deposits; in Wealth Management & Bank for Entrepreneurs, it is assumed that all customer deposits are held with the bank primarily for investment purposes

2022

Private Bank recorded a profit before tax of € 2.0 billion in 2022, up more than fivefold compared to € 355 million in the prior year. This is the highest profit before tax since the formation of Private Bank in 2019. Post-tax return on average tangible shareholders' equity rose to 10.6%, up from 1.4% in the prior year, with post-tax return on average shareholders' equity of 9.6%, up from 1.3%. The cost/income ratio improved to 72%, down from 90% in the prior year, reflecting growth of 11% in revenues combined with a reduction of 11% in noninterest expenses.

Net revenues grew to € 9.2 billion, up 11% year on year. The increase partly reflected higher specific revenue items, mainly a gain of approximately € 310 million from the sale of the Deutsche Bank Financial Advisors business in Italy, as well as the positive impact of reduced forgone revenues related to the 2021 German Federal Court of Justice (BGH) ruling on pricing agreements. Adjusted for these impacts, net revenues grew by 6% year on year, driven by higher net interest income, foreign exchange rate movements and continued business growth. Business growth was € 41 billion in 2022 and reflected net inflows into assets under management of € 30 billion, including net inflows into investment products of € 25 billion and deposits of € 5 billion, as well as net new client loans of € 11 billion.

Private Bank Germany generated net revenues of € 5.3 billion, up 6% year on year, partly reflecting the reduction in forgone revenues from the BGH ruling. Adjusted for this impact, revenues were up 4% as higher net interest income from deposit products more than offset the impacts of lower loan revenues and fee income in a more challenging macro-economic environment.

In International Private Bank, net revenues were € 3.8 billion, up 19% year on year, and up 9% if adjusted for the aforementioned gain on sale, and for Sal. Oppenheim workout activities. Revenue growth was mainly attributable to higher deposit revenues due to interest rate increases, continued loan book expansion and positive foreign exchange rate movements. Revenues from investment products benefitted from net inflows, but were also impacted by a more challenging market environment. International Private Bank attracted net new volumes of € 29 billion across loans and assets under management in the full year, the highest since its formation.

Assets under management in Private Bank declined by € 36 billion to € 518 billion at year end. This development reflected € 56 billion in negative impacts from market developments and a € 15 billion disposal net effect after the sale of the Financial Advisors business in Italy, partly offset by € 30 billion net inflows and a € 6 billion positive impact from foreign exchange rate movements.

Provision for credit losses was € 583 million, 22 basis points of average loans, partly driven by certain single exposures in the international franchise. Excluding these, the development of the overall portfolio continued to reflect the high quality of the loan book and ongoing tight risk discipline. This compares to € 446 million provision for credit losses in the prior year, which benefitted from a more stable macroeconomic environment.

Noninterest expenses were € 6.6 billion, a reduction of 11% year on year. This development reflected a positive impact from the release of litigation provisions recorded in the prior year related to the BGH ruling, lower restructuring expenses in the context of the execution of strategic objectives and a year-on-year reduction in adjusted costs of 5%. The latter was driven by incremental savings from transformation initiatives including workforce reductions and the closure of more than 170 branches. Ongoing cost management and lower internal service cost allocations also contributed to the reduction in adjusted costs. These effects were partly offset by a negative impact from foreign exchange rate movements.

2021

In 2021, Private Bank made significant progress in the execution of its transformation strategy and in its priority to grow business volumes. Net new business volumes were € 46 billion across assets under management and loans. Profit before tax of € 355 million in 2021 was impacted by transformation related effects of € 458 million including € 237 million restructuring and severance expenses as well as € 221 million transformation charges. This compares to a loss before tax of € 108 million in 2020, which included a € 88 million negative impact from the sale of Postbank Systems AG and transformation related effects of € 642 million. Adjusted for transformation related effects and for specific revenue items related to Sal. Oppenheim workout activities in International Private Bank, profit before tax was € 711 million in 2021 despite negative impacts of € 284 million from the BGH ruling. This compares to an adjusted profit before tax of € 509 million in 2020. The year over year improvement mainly reflected lower provision for credit losses and revenue growth.

Net revenues of € 8.2 billion in 2021 increased by € 109 million, or 1%, compared to 2020. Revenues were up 2% year on year if adjusted for the aforementioned loss of € 88 million in the prior year from the sale of Postbank Systems AG and a negative revenue impact of € 154 million in 2021 related to the BGH ruling. Business growth in investment products and loans in a normalizing market environment more than offset significant interest rate headwinds. Revenues also benefited from the ECB's TLTRO III program.

In Private Bank Germany, net revenues were € 5.0 billion and remained stable year on year. Excluding the impact of the BGH ruling and the aforementioned negative impact from the sale of Postbank Systems AG in prior year, revenues were up 2%. Continued strong business growth in investment and mortgage products mitigated significant deposit margin compression impacts. Revenue growth also benefited from the ECB's TLTRO III program.

Net revenues in International Private Bank of € 3.2 billion increased by € 90 million, or 3% year on year. Headwinds from lower interest rates and negative impacts from foreign currency translation were more than offset by sustained business growth in investment products and lending supported by continued hiring of relationship managers. Revenue growth also benefited from the ECB's TLTRO III program.

Assets under management of € 554 billion increased by € 59 billion compared to December 31, 2020. The increase was mainly attributable to € 30 billion net inflows as well as € 23 billion market appreciation and € 8 billion positive impact from foreign exchange rate movements. Net inflows of € 30 billion during 2021 were mainly in investment products.

Provision for credit losses amounted to € 446 million in 2021 compared to € 711 million in 2020. The year-on-year decrease of 37% reflected a more benign macroeconomic environment, tight risk discipline and a high-quality loan book.

Noninterest expenses were € 7.4 billion, down € 89 million, or 1% year on year, reflecting lower transformation related effects partly offset by higher litigation charges, which included a € 128 million negative impact related to the BGH ruling. Adjusted costs excluding transformation charges of € 6.8 billion increased by € 43 million, or 1% year on year. Incremental savings from transformation initiatives were offset by higher spend for technology and internal services, higher costs for deposit protection schemes and higher variable compensation driven by improved business performance. The increase also reflected the non-recurrence of a one-time benefit in the prior year associated with pension obligations.

Asset Management

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues							
Management fees	2,458	2,370	2,136	88	4	233	11
Performance and transaction fees	125	212	90	(86)	(41)	122	135
Other	24	126	3	(102)	(81)	123	N/M
Total net revenues	2,608	2,708	2,229	(100)	(4)	478	21
Provision for credit losses	(2)	5	2	(6)	N/M	3	148
Noninterest expenses							
Compensation and benefits	899	822	740	77	9	82	11
General and administrative expenses	869	840	763	29	3	77	10
Impairment of goodwill and other intangible assets	68	0	0	68	N/M	(0)	N/M
Restructuring activities	0	2	22	(2)	(95)	(20)	(92)
Total noninterest expenses	1,836	1,664	1,526	173	10	138	9
Noncontrolling interests	174	223	157	(49)	(22)	66	42
Profit (loss) before tax	598	816	544	(217)	(27)	272	50
Total assets (in € bn.) ¹	10	10	9	(0)	(2)	1	10
Assets under management (in € bn.)	821	928	793	(106)	(11)	135	17
Net flows (in € bn.)	(20)	48	30	(68)	N/M	17	N/M
Total employees (directly-managed, full-time equivalent)	4,283	4,072	3,926	211	5	146	4

N/M – Not meaningful

Prior years comparatives aligned to presentation in the current year

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances

2022

Profit before tax was € 598 million, down 27%, mainly driven by significantly lower performance fees and other income, and an impairment of intangibles assets. Adjusted for restructuring and severance expenses and impairments of goodwill and other intangible assets, profit before tax was € 703 million, down 16%.

Net revenues for 2022 were € 2.6 billion, down 4%, as higher management fees were more than offset by significantly lower performance fees, reflecting the non-recurrence of a performance fee of € 89 million from an Active Asset fund recognized in 2021, and significantly lower other revenues.

Noninterest expenses were € 1.8 billion in 2022, up 10%. Adjusted costs increased by 4%, mainly due to higher compensation and benefits driven by a rise in headcount to support transformation and growth. Non-operating costs include a € 68 million impairment of an unamortized intangible asset related to U.S. mutual fund retail contracts. The cost/income ratio was 70%, up 9 percentage points compared to the prior year.

Net flows were negative € 20 billion, primarily in lower margin products Fixed Income, Cash and Passive, impacted by industry-wide pressure on flows. This was partly offset by net inflows in higher-margin products Multi Asset and Alternatives. ESG products attracted net inflows of € 1 billion in 2022 despite the adverse environment.

Assets under Management decreased by € 106 billion, or 11%, to € 821 billion during 2022, mainly driven by negative market developments and net outflows, while foreign exchange rate movements had a positive impact.

The following table provides the development of assets under management during 2022, broken down by product type as well as the respective management fee margins:

in € bn.	Active Equity	Active Fixed Income	Active Multi Asset	Active SQL	Active Cash	Passive	Alternatives	Assets under management
Balance as of December 31, 2021	116	227	70	77	84	238	115	928
Inflows	16	39	16	10	562	81	17	741
Outflows	(17)	(51)	(10)	(11)	(568)	(88)	(16)	(761)
Net Flows	(1)	(12)	6	(0)	(6)	(7)	1	(20)
FX impact	2	7	0	0	2	7	4	22
Performance	(18)	(28)	(8)	(13)	0	(38)	(2)	(108)
Other	(0)	1	0	(0)	(0)	(1)	0	0
Balance as of December 31, 2022	99	194	68	64	80	199	118	821
Management fee margin (in bps)	71	12	31	29	3	18	50	28

2021

Profit before tax was € 816 million, up 50%, while adjusted profit before tax was € 840 million, up 43%. The strong increase was driven by significantly higher revenues.

Net revenues for 2021 were € 2.7 billion, up 21%, mainly due to increased management fees and supported by higher performance fees and other revenues, partly reflecting seven consecutive quarters of net inflows and growth in assets under management.

Noninterest expenses were € 1.7 billion in 2021, up 9%. Adjusted costs excluding transformation charges increased by 10%, reflecting higher compensation and benefits costs and increased costs for services in connection with higher assets under management and volumes. The cost/income ratio was 61%, an improvement of 7 percentage points over the prior year.

Net inflows were € 48 billion, primarily driven by Passive and Active (excluding cash) and further supported by Alternatives and Cash products. ESG dedicated funds accounted for 40% of total annual net inflows.

Assets under Management grew by € 135 billion, or 17%, to € 928 billion during 2021, driven by a combination of record net inflows, supportive market developments and positive exchange rate movements.

The following table provides the development of assets under management during 2021, broken down by product type as well as the respective management fee margins:

in € bn.	Active Equity	Active Fixed Income	Active Multi Asset	Active SQL	Active Cash	Passive	Alternatives	Assets under management
Balance as of December 31, 2020	97	220	59	69	75	179	93	793
Inflows	16	47	13	14	510	95	14	708
Outflows	(16)	(43)	(9)	(11)	(504)	(69)	(9)	(660)
Net Flows	(1)	5	4	2	6	26	6	48
FX impact	2	8	0	0	4	8	3	26
Performance	18	(4)	6	5	(0)	25	11	60
Other	(0)	(0)	1	0	(0)	(1)	1	1
Balance as of December 31, 2021	116	227	70	77	84	238	115	928
Management fee margin (in bps)	72	13	33	28	3	18	49	28

Capital Release Unit

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues	(28)	26	(225)	(54)	N/M	251	N/M
Provision for credit losses	(17)	(42)	29	25	(59)	(70)	N/M
Noninterest expenses							
Compensation and benefits	60	128	168	(68)	(53)	(40)	(24)
General and administrative expenses	864	1,306	1,774	(442)	(34)	(468)	(26)
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	(2)	(2)	5	0	(21)	(7)	N/M
Total noninterest expenses	922	1,432	1,947	(510)	(36)	(515)	(26)
Noncontrolling interests	–	0	(0)	0	N/M	0	N/M
Profit (loss) before tax	(932)	(1,364)	(2,200)	431	(32)	836	(38)
Total assets (in € bn.)¹	62	132	198	(70)	(53)	(66)	(33)
Total employees (directly-managed, full-time equivalent)	194	267	472	(73)	(27)	(205)	(43)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances

2022

Capital Release Unit reported a loss before tax of € 932 million in 2022, a reduction of 32% from a loss of € 1.4 billion in 2021, primarily reflecting year on year cost reductions.

Net revenues were negative € 28 million in 2022, compared to positive € 26 million in the prior year, with lower revenues due to the non-recurrence of the Prime Finance cost recovery that more than offset lower de-risking and funding impacts.

Noninterest expenses declined by 36% compared to prior year, primarily driven by a 35% reduction in adjusted costs, reflecting lower internal service charges and a decline in direct compensation and noncompensation costs.

Provision for credit losses were a net release of € 17 million in 2022, compared to a net release of € 42 million in 2021. The net release in both years were driven by recoveries across shipping and other legacy portfolios.

At the end of 2022, leverage exposure was reduced to € 22 billion, down 43% from the end of 2021 and down 91% since the creation of the Capital Release Unit in mid-2019.

Risk-weighted assets (RWA) were € 24 billion at the end of 2022, down by 13% year on year and by 63%, or 83% excluding Operational Risk RWA since the Capital Release Unit's creation. As at year-end 2022, risk-weighted assets of € 24 billion included € 19 billion of Operational Risk RWA.

Having fulfilled its de-risking and cost reduction mandate from 2019 through the end of 2022, the Capital Release Unit will no longer be reported as a separate segment effective from the first quarter of 2023. The financial impact of the Capital Release Unit will be reported within the Corporate & Other segment. This change does not involve the transfer of assets to or from the Core businesses. Most of the remaining Capital Release Unit assets will roll off over time. These are mostly interest rate derivatives but also include the Polish FX mortgage portfolio and certain other FIC Sales & Trading and Equities assets.

2021

Capital Release Unit reported a loss before tax of € 1.4 billion in 2021, a reduction of 38% versus a loss of € 2.2 billion in 2020, primarily reflecting year on year cost reductions.

Net revenues were € 26 million in 2021, versus negative € 225 million in the prior year, as revenues from Prime Finance cost recovery and the loan portfolio were only partly offset by funding, risk management and de-risking impacts.

Provision for credit losses were a net release of € 42 million, compared to a provision of € 29 million in 2020. The net release was driven by the legacy real estate and shipping portfolios.

Noninterest expenses were € 1.4 billion, down 26% year on year. This development was primarily driven by a 37% reduction in adjusted costs, reflecting lower internal service charges and bank levy allocations as well as lower direct expenses.

Leverage exposure was € 39 billion at year end 2021, down from € 72 billion at the end of 2020, and ahead of the division's latest year-end 2022 target from the 2020 Investor Deep Dive of € 51 billion. This progress partly reflected the transfer of Deutsche Bank's Global Prime Finance and Electronic Equities businesses, which was successfully completed by the end of 2021, in line with the target timeline.

Risk-weighted assets were € 28 billion at the end of 2021, down from € 34 billion at the end of 2020 and ahead of the bank's year-end 2022 target of € 32 billion.

Corporate & Other

				2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
in € m. (unless stated otherwise)	2022	2021	2020	in € m.	in %	in € m.	in %
Net revenues	(1,024)	(212)	(552)	(812)	N/M	340	(62)
Provision for credit losses	8	5	(4)	3	53	9	N/M
Noninterest expenses							
Compensation and benefits	3,165	3,012	3,215	153	5	(204)	(6)
General and administrative expenses	(2,272)	(2,009)	(2,651)	(263)	13	641	(24)
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	0	(0)	3	0	N/M	(3)	N/M
Total noninterest expenses	893	1,002	568	(109)	(11)	435	77
Noncontrolling interests	(190)	(206)	(169)	16	(8)	(37)	22
Profit (loss) before tax	(1,736)	(1,014)	(947)	(722)	71	(67)	7
Employees (full-time equivalent)	31,865	30,103	29,627	1,762	6	476	2

N/M – Not meaningful
Prior year's comparatives aligned to presentation in the current year

2022

Corporate & Other reported a loss before tax of € 1.7 billion in 2022 compared to a loss before tax of € 1.0 billion in 2021, primarily reflecting higher negative net revenues.

Net revenues were negative € 1.0 billion in 2022, compared to negative € 212 million in 2021. Revenues related to valuation and timing differences were negative € 267 million in 2022, compared to € 286 million in 2021. Net revenues relating to funding and liquidity were negative € 311 million in 2022, versus negative € 242 million in 2021.

Noninterest expenses were € 893 million in 2022, a reduction of € 109 million, or 11%, compared to 2021. The reduction was primarily driven by € 603 million of transformation related expenses booked in 2021, partly related to a contract settlement and software impairments, mainly triggered by the bank's migration to the cloud technology. The decline in transformation related expenses more than offset the increase from certain higher than planned infrastructure expenses in 2022 that were retained centrally in Corporate & Other. Expenses associated with shareholder activities as defined in the OECD Transfer Pricing guidelines not allocated to the business divisions were € 506 million in 2022, versus € 460 million in 2021.

Noncontrolling interests are deducted from the profit before tax of the divisions and reversed in Corporate & Other. These amounted to € 190 million in 2022, compared to € 206 million in 2021, mainly related to DWS

2021

Corporate & Other reported a loss before tax of € 1.0 billion in 2021 compared to a loss before tax of € 947 million in 2020, primarily reflecting higher noninterest expenses.

Net revenues were negative € 212 million in 2021, compared to negative € 552 million in 2020. Revenues related to valuation and timing differences were € 286 million in 2021, compared to negative € 103 million in 2020. This improvement was driven by the positive mark-to-market impact from interest rate hedging activities in connection with the bank's funding arrangements where hedge accounting cannot be applied. Net revenues relating to funding and liquidity were negative € 242 million in 2021, versus negative € 235 million in 2020.

Noninterest expenses were € 1.0 billion in 2021, an increase of € 435 million, or 77%, compared to 2020. 2021 noninterest expenses included € 603 million of transformation related expenses booked in Corporate & Other, partly related to a contract settlement and software impairments, partly triggered by the bank's migration to the cloud technology. Expenses associated with shareholder activities as defined in the OECD Transfer Pricing guidelines not allocated to the business divisions were € 460 million in 2021, versus € 403 million in 2020.

Noncontrolling interests are deducted from the profit before tax of the divisions and reversed in Corporate & Other. These amounted to € 206 million in 2021, compared to € 169 million in 2020, mainly related to DWS.

Financial Position

Assets

in € m. (unless stated otherwise)	Dec 31, 2022	Dec 31, 2021	Absolute Change	Change in %
Cash, central bank and interbank balances	186,091	199,363	(13,272)	(7)
Central bank funds sold, securities purchased under resale agreements and securities borrowed	11,478	8,432	3,047	36
Financial assets at fair value through profit or loss	482,545	491,233	(8,688)	(2)
Of which: Trading assets	92,867	102,396	(9,529)	(9)
Of which: Positive market values from derivative financial instruments	299,856	299,732	123	0
Of which: Non-trading financial assets mandatory at fair value through profit and loss	89,654	88,965	689	1
Financial assets at fair value through other comprehensive income	31,675	28,979	2,696	9
Loans at amortized cost	491,175	472,069	19,106	4
Remaining assets	141,252	124,630	16,622	13
Of which: Brokerage and securities related receivables	71,250	71,495	(245)	(0)
Total assets	1,344,217	1,324,705	19,512	1

Liabilities and Equity

in € m. (unless stated otherwise)	Dec 31, 2022	Dec 31, 2021	Absolute Change	Change in %
Deposits	629,183	604,396	24,787	4
Central bank funds purchased, securities sold under repurchase agreements and securities loaned	585	772	(187)	(24)
Financial liabilities at fair value through profit or loss	388,138	400,857	(12,719)	(3)
Of which: Trading liabilities	50,616	54,718	(4,102)	(7)
Of which: Negative market values from derivative financial instruments	282,418	287,109	(4,691)	(2)
Of which: Financial liabilities designated at fair value through profit or loss	54,634	58,468	(3,834)	(7)
Other short-term borrowings	5,122	4,034	1,089	27
Long-term debt	131,525	144,485	(12,959)	(9)
Remaining liabilities	117,522	102,063	15,459	15
Of which: Brokerage and securities related payables	82,711	70,165	12,546	18
Total liabilities	1,272,076	1,256,606	15,470	1
Total equity	72,141	68,099	4,042	6
Total liabilities and equity	1,344,217	1,324,705	19,512	1

Movements in Assets and Liabilities

As of December 31, 2022, the total balance sheet of € 1.3 trillion was essentially flat compared to year-end 2021.

In the fourth quarter 2022, Deutsche Bank partially prepaid TLTRO funding in respect of the tranche maturing in June 2023, in line with the bank's communicated strategy to actively manage the maturity profile of its TLTRO participation. This prepayment was the main driver for the decrease in cash, central bank and interbank balances by € 13.3 billion and in long term debt by € 13.0 billion, respectively.

Trading assets and trading liabilities decreased by € 9.5 billion and € 4.1 billion, respectively, primarily driven by debt securities, mainly due to managed reductions and decreased bond positions in Europe and U.S. rates business due to volatile market conditions.

Positive and negative market values of derivative financial instruments are largely flat year on year. The increase in positive and negative market values during the first three quarters was offset by a corresponding decrease in the fourth quarter, mainly driven by moves in foreign exchange products in the Investment Bank due to a weakening of the U.S. dollar versus the euro and moves in interest rate curves.

Loans at amortized cost increased by € 19.1 billion, primarily driven by higher origination across the financing businesses in the Investment Bank as well as continued growth in collateralized lending and mortgages in the Private Bank.

Deposits increased by € 24.8 billion. Given the current macro environment, corporate clients are holding higher cash reserves in the Corporate Bank along with higher inflows in the Private Bank and Global Emerging Markets in the Investment Bank.

Remaining assets increased by € 16.6 billion, mainly driven by growth in debt securities classified as hold to collect in line with the bank's strategic initiative to optimize return on excess liquidity. Remaining liabilities increased by € 15.5 billion, mainly attributable to an increase in cash margin payables driven by increased client volume and trading activity.

The overall movement of the balance sheet included an increase of € 20.8 billion due to foreign exchange rate movements, mainly driven by a strengthening of the U.S. dollar against the euro. The effects from foreign exchange rate movements are embedded in the movement of the balance sheet line items discussed in this section.

Liquidity

Total High Quality Liquid Assets (HQLA) as defined by the Commission Delegated Regulation (EU) 2015/61 and amended by Regulation (EU) 2018/1620 were € 219 billion as of December 31, 2022, a € 12 billion increase from € 207 billion as of December 31, 2021. The Group maintains additional highly liquid central bank eligible assets, not qualifying as HQLA or subject to transfer restrictions under the HQLA definition. These additional liquid assets were € 37 billion as at the end of December 31, 2022, such that the Group's total Liquidity Reserves were € 256 billion. The increase is primarily driven by higher deposits and new capital market issuances partially offset by increased lending activity and partial repayment of the ECB's TLTRO. The Liquidity Coverage Ratio was 142% at the end fourth quarter of 2022, a surplus to regulatory requirements of € 64 billion as compared to 133% as at the end of fourth quarter of 2021, a surplus to regulatory requirements of € 52 billion.

Equity

Total equity as of December 31, 2022 increased by € 4.0 billion compared to December 31, 2021. This change was driven by a number of factors including the profit reported for the period of € 5.4 billion and an issuance of additional equity components (Additional Tier 1 securities, treated as equity in accordance with IFRS) of € 2 billion (issued € 750 million on April 4, 2022 and € 1.3 billion on November 14, 2022). Further contributing to the increase were a positive impact from remeasurement gains related to defined benefit plans of € 553 million, net of tax, a positive impact from foreign currency translation of € 454 million, net of tax, mainly resulting from the strengthening of the U.S. dollar against the Euro and a change in noncontrolling interests of € 94 million, net of tax. This was partly offset by a repayment of additional equity components (Additional Tier 1 securities, treated as equity in accordance with IFRS) of € 1.8 billion on May 2, 2022, unrealized net losses of financial assets at fair value through other comprehensive income of € 1.0 billion, net of tax, and unrealized net losses on derivatives hedging variability of cashflows of € 537 million, net of tax. Further factors were coupons paid on additional equity components of € 479 million, cash dividends paid to Deutsche Bank shareholders of € 406 million as well as net purchases of treasury shares of € 325 million.

Own Funds

Deutsche Bank's CRR/CRD Common Equity Tier 1 capital as of December 31, 2022, increased by € 1.6 billion to € 48.1 billion, compared to € 46.5 billion as of December 31, 2021. The Risk-weighted assets (RWA) increased by € 8.4 billion to € 360.0 billion as of December 31, 2022, compared to € 351.6 billion as of December 31, 2021. The CET 1 capital ratio increased to 13.4% on December 31, 2022, from 13.2% on December 31, 2021, as a result of an increase in CET 1 capital of 0.5%, which was partially offset by an increase in RWA of 0.3%.

The Bank's Tier 1 capital as of December 31, 2022, amounted to € 56.6 billion, consisting of a CET 1 capital of € 48.1 billion and Additional Tier 1 capital of € 8.5 billion. The Tier 1 capital was € 1.2 billion higher than at the end of December 31, 2021, driven by an increase in CET 1 capital of € 1.6 billion and decrease in AT1 capital of € 0.4 billion since year end 2021. The Tier 1 capital ratio as of December 31, 2022, remains unchanged at 15.7% compared to December 31, 2021.

Total Regulatory capital as of December 31, 2022, amounted to € 66.1 billion compared to € 62.7 billion at the end of December 31, 2021. The Total capital increase was driven by an increase in Tier 1 capital of € 1.2 billion and an increase in Tier 2 capital of € 2.2 billion since year end 2021. The Total capital ratio as of December 31, 2022, increased to 18.4% compared to 17.8% on December 31, 2021.

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Tabular Disclosure of Contractual Obligations

Cash payment requirements outstanding as of December 31, 2022.

Contractual obligations					Payment due by period
in € m.	Total	Less than 1 year	1–3 years	3–5 years	More than 5 years
Long-term debt obligations ¹	145,695	50,053	36,581	32,747	26,314
Trust preferred securities ^{1,2}	514	514	0	0	0
Long-term financial liabilities designated at fair value through profit or loss ³	5,351	2,208	1,545	742	855
Future cash outflows not reflected in the measurement of Lease liabilities ⁴	5,889	14	207	406	5,263
Lease liabilities ¹	5,460	632	807	807	3,214
Purchase obligations	4,221	781	1,622	897	921
Long-term deposits ¹	26,126	0	12,314	4,077	9,735
Other long-term liabilities	721	511	39	21	149
Total	193,977	54,713	53,115	39,698	46,451

¹ Includes interest payments.

² Contractual payment date or first call date.

³ Long-term debt and long-term deposits designated at fair value through profit or loss.

⁴ For further detail please refer to Note 22 "Leases".

Purchase obligations for goods and services include future payments for, among other things, information technology services and facility management. Some figures above for purchase obligations represent minimum contractual payments and actual future payments may be higher. Long-term deposits exclude contracts with a remaining maturity of less than one year. Under certain conditions future payments for some long-term financial liabilities designated at fair value through profit or loss may occur earlier. See the following notes to the consolidated financial statements for further information: Note 5 "Net Interest Income and Net Gains (Losses) on Financial Assets/Liabilities at Fair Value through Profit or Loss", Note 22 "Leases", Note 26 "Deposits" and Note 30 "Long-Term Debt and Trust Preferred Securities".

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Risk Report

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Introduction

Disclosures in line with IFRS 7

The following Risk Report provides qualitative and quantitative disclosures about credit, market and other risks in line with the requirements of International Financial Reporting Standard 7 (IFRS 7) Financial Instruments: Disclosures. It also considers the underlying classification and measurement and impairment requirements in IFRS 9 with further details to be found in the “Credit Risk Management and Asset quality” section, in the “Asset quality” section, in the “Credit risk mitigation” section and in Note 1 “Significant accounting policies and critical accounting estimates” to the consolidated financial statements. Information which forms part of and is incorporated by reference into the financial statements of this report is marked by a light blue shading throughout this Risk Report.

European Regulation (EU) 2019/876 and Directive (EU) 2019/878 introduced amendments to the CRR/CRD with various changes to the regulatory framework that became applicable for June 30, 2021: A new standardized approach for counterparty credit risk (SA-CCR) was introduced that replaces the mark-to-market method to determine the exposure value for derivatives that are not in scope of the internal model method. In addition, a new framework to determine the risk weight for banking book investments in collective investment undertakings and default fund contributions to central counterparties was introduced. Moreover, a minimum regulatory leverage ratio of 3% is determined as the ratio of Tier 1 capital and the regulatory leverage exposure. In addition, a minimum Net Stable Funding Ratio (NSFR) of 100% was introduced that requires banks to maintain a stable funding profile in relation to their on and off balance sheet exposures.

Deutsche Bank applies the definition of default based on the EBA technical standard regarding the materiality threshold for credit obligations past due (implemented with ECB regulation (EU) 2018/1845) and the guideline on the application of the definition of default. The ECB’s approval was received in August 2021 and Deutsche Bank introduced the new requirements subsequently in 2021. The new requirements replaced the default definition under Basel II and is applied to all key risk metrics throughout the Annual Report including as a trigger to Stage 3 under IFRS 9.

Since June 30, 2020, the Group applies the transitional arrangements in relation to IFRS 9 as provided in the current CRR/CRD for all CET1 measures.

Disclosures according to Pillar 3 of the Basel 3 Capital Framework

Deutsche Bank’s disclosures according to Pillar 3 of the Basel 3 Capital Framework, which are implemented in the European Union by the Regulation (EU) No 575/2013 on prudential requirements for credit institutions (Capital Requirements Regulation or CRR), including recent amendments; and supported by the EBA guideline “Final draft implementing technical standards on public disclosures by institutions of the information referred to in Titles II and III of Part Eight of Regulation (EU) No 575/2013” and related guidelines applicable to Pillar 3 disclosures, are published in the Group’s Pillar 3 Report, which can be found on Deutsche Bank’s website.

Disclosures according to principles and recommendations of the Enhanced Disclosure Task Force

In 2012 the Enhanced Disclosure Task Force (EDTF) was established as a private sector initiative under the auspices of the Financial Stability Board (FSB), with the primary objective to develop fundamental principles for enhanced risk disclosures and to recommend improvements to existing risk disclosures. Deutsche Bank adheres to the disclosure recommendations in this Risk Report and also in its Pillar 3 report.

Risk and capital overview

Key risk metrics

As mentioned in the section Risks and Opportunities above, the bank is exposed to a variety of financial and non-financial risk factors. Over the course of 2022, the economic growth prospects have deteriorated driven by persistent and rising inflation, the interest rate environment and supply chain disruptions as the global economy experienced high levels of uncertainty from the ongoing war in Ukraine. Potential downside risks to economic activity and financial markets remain elevated.

The following selected key risk ratios and corresponding metrics form part of Deutsche Bank's holistic risk management across individual risk types. The Common Equity Tier 1 ratio, Economic Capital Adequacy Ratio, Leverage ratio, Total Loss Absorbing Capacity, Minimum Requirement for Own Funds and Eligible Liabilities, Liquidity Coverage Ratio, Net Stable Funding Ratio and Stressed Net Liquidity Position serve as high-level metrics and are fully integrated across strategic planning, risk appetite framework, and recovery and resolution planning practices, which are reviewed and approved by the Management Board at least annually.

Common Equity Tier 1 Ratio		Risk-Weighted Assets	
31.12.2022	13.4 %	31.12.2022	€ 360.0 bn
31.12.2021	13.2 %	31.12.2021	€ 351.6 bn
Economic Capital Adequacy Ratio		Economic Capital	
31.12.2022	239 %	31.12.2022	€ 20.9 bn
31.12.2021	206 %	31.12.2021	€ 23.5 bn
Leverage Ratio		Leverage Exposure	
31.12.2022 ¹	4.6 %	31.12.2022	€ 1,240 bn
31.12.2021 (fully loaded) ^{2 3}	4.9 %	31.12.2021 ³	€ 1,125 bn
Total loss absorbing capacity (TLAC)		Minimum requirement for own funds and eligible liabilities (MREL)	
31.12.2022 (Risk Weighted Asset based)	32.2 %	31.12.2022	34.4 %
31.12.2022 (Leverage Exposure based)	9.3 %		
31.12.2021 (Risk Weighted Asset based)	31.0 %	31.12.2021	32.7 %
31.12.2021 (Leverage Exposure based)	9.7 %		
Liquidity Coverage Ratio		Stressed Net Liquidity Position (sNLP)	
31.12.2022	142 %	31.12.2022	€ 48.1 bn
31.12.2021	133 %	31.12.2021 ⁴	€ 43.3 bn
		Net Stable Funding Ratio (NSFR)	
		31.12.2022	120 %
		31.12.2021	121 %

¹ Starting with first quarter of 2022 leverage numbers are presented as reported as the fully loaded definition has been eliminated as resulting only in an immaterial difference

² Comparative information for earlier periods is based on Deutsche Bank's earlier fully loaded definition

³ Since April 1, 2022, Deutsche Bank no longer excludes certain central bank exposures (amounting to € 99 billion as of December 31, 2021), based on Article 429a (1) (n) CRR and the ECB Decision 2021/1074 as this temporary exemption during the COVID-19 pandemic ended on March 31, 2022; not applying the temporary exclusion of certain central bank exposures the leverage exposure was € 1,223 billion as of December 31, 2021, corresponding to a leverage ratio of 4.5%

⁴ December 2021 sNLP has been updated from € 47.6 billion to € 43.3 billion due to a model change for a product variant in the Investment bank portfolio

Deutsche Bank regularly assess the potential impacts of risks on its balance sheet and profitability through portfolio reviews and stress tests. Stress tests are also used to test the resilience of Deutsche Bank's strategic plans. The results of these tests indicate that the currently available capital and liquidity reserves, in combination with available mitigation measures, are sufficient to withstand periods of potential stress.

The Group concludes that the risks, as described above or in the following sections, to which Deutsche Bank is exposed to, including potential impacts on its business strategy, provide a true and fair picture of its risk profile.

For further details please refer to sections "Risk profile", "Risk appetite and capacity", "Risk and capital plan", "Stress testing", "Recovery and resolution planning", "Risk and capital management", "Capital, leverage ratio, TLAC and MREL", "Liquidity coverage ratio", and "Stress testing and scenario analysis".

Risk profile

The table below shows Deutsche Bank's overall risk position as measured by the economic capital demand calculated for credit, market, operational and strategic risk for the dates specified. Deutsche Bank's overall economic risk position also considers diversification benefits across risk types.

Overall risk position as measured by economic capital demand by risk type

in € m. (unless stated otherwise)	Dec 31, 2022	Dec 31, 2021	2022 increase (decrease) from 2021	
			in € m.	in %
Credit risk	11,802	11,725	76	1
Market risk	6,355	7,920	(1,565)	(20)
Trading market risk	1,387	2,292	(904)	(39)
Nontrading market risk	4,968	5,628	(660)	(12)
Operational risk	4,668	4,937	(270)	(5)
Strategic risk	1,854	3,173	(1,319)	(42)
Diversification benefit ¹	(3,778)	(4,213)	435	(10)
Total economic capital demand	20,900	23,542	(2,642)	(11)

¹ Diversification benefit across credit, market, operational and strategic risk

As of December 31, 2022, Deutsche Bank's economic capital demand amounted to € 20.9 billion, which was € 2.6 billion or 11% lower than € 23.5 billion economic capital demand as of December 31, 2021, which was driven by decreases in economic capital demand market risk, strategic risk and operational risk partly offset by diversification benefit.

The economic capital demand for market risk totaled € 6.4 billion as of December 31, 2022, which was € 1.6 billion or 20% lower compared to year-end 2021. The decrease was mainly driven by reduction of credit and wholesale loan inventory in the Investment Bank and reduced credit exposure in the Group's defined benefit pension plan assets, lower equity risk arising from the share-based compensation plans and a decrease in rates exposure from Treasury funding activities.

The strategic risk category captures the economic capital arising from earnings volatility risk (which also includes potential losses from software assets), tax redetermination risk, and a capital charge for the risk related to deferred tax assets on temporary differences. The economic capital for strategic risk decreased to € 1.9 billion as of December 31, 2022, which was € 1.3 billion or 42% lower compared to December 31, 2021. This reduction reflects the implementation of a model enhancement for software assets, lower deferred tax assets on temporary differences and a decrease in tax re-determination risk.

The operational risk economic capital usage totaled € 4.7 billion as of December 31, 2022, which was € 0.3 billion or 5% lower than the € 4.9 billion economic capital usage as of December 31, 2021. In line with the development of the Group's RWA for operational risk, the decrease was largely driven by a lighter internal loss profile, in particular lower loss frequency feeding into Group's capital model. For a detailed description see the section "Operational risk management".

The inter-risk diversification benefit of the economic capital demand across credit, market, operational and strategic risk totaled € 3.8 billion as of December 31, 2022, which was € 0.4 billion or 10% lower compared to year-end 2021. This decrease mainly reflects changes in the underlying risk type profile.

Deutsche Bank's mix of business activities results in diverse risk taking by the business divisions. The Group also measures the key risks inherent in the respective business models through the total economic capital metric, which mirrors each business division's risk profile and considers cross-risk effects at group level.

Risk profile of Deutsche Bank's business divisions as measured by economic capital

	Dec 31, 2022						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total (in %)
Credit risk	2,760	4,259	2,344	53	194	2,192	11,802
Market risk	343	1,177	662	180	108	3,886	6,355
Operational risk	424	1,852	611	273	1,507	0	4,668
Strategic risk	0	0	0	0	0	1,854	1,854
Diversification benefit ¹	(440)	(1,308)	(543)	(162)	(758)	(567)	(3,778)
Total EC	3,088	5,980	3,073	344	1,051	7,365	20,900
Total EC in %	15	29	15	2	5	35	100

N/M – Not meaningful

¹ Diversification benefit across credit, market, operational and strategic risk

	Dec 31, 2021						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total (in %)
Credit risk	2,984	4,869	2,519	60	376	917	11,725
Market risk	306	2,094	570	83	140	4,728	7,920
Operational risk	446	2,002	602	269	1,619	0	4,937
Strategic risk	242	10	32	0	1	2,888	3,173
Diversification benefit ¹	(478)	(1,533)	(540)	(145)	(826)	(693)	(4,213)
Total EC	3,500	7,442	3,183	267	1,309	7,840	23,542
Total EC in %	15	32	14	1	6	33	100

N/M – Not meaningful

¹ Diversification benefit across credit, market, operational and strategic risk

Corporate Bank's risk profile is dominated by its Trade Finance, Commercial Banking and Cash Management products and services offered. Economic capital demand largely arises from credit risk and is predominantly driven by the Trade Finance and Commercial Clients businesses. The economic capital demand for the Corporate Bank decreased by € 0.4 billion in comparison to year-end 2021 mainly driven by strategic risk due to changes in the business allocation process and a reduction in credit risk exposures.

Investment Bank's risk profile is dominated by its financing and trading activities, which give rise to all major risk types. Credit risk in the Investment Bank is broadly distributed across business units but most prominent in Global Credit Trading, Rates and Leveraged Debt Capital Markets. Market risk arises mainly from trading and market making activities. The economic capital demand for the Investment Bank decreased by € 1.5 billion in comparison to year-end 2021 as a result of lower market and credit risk. Economic capital demand for market risk decreased by € 0.9 billion mainly due to lower levels of corporate bond inventory and a reduction on the Leverage Lending and Commercial Real Estate pipeline. The reduction in credit risk economic capital demand of € 0.6 billion was driven by lower counterparty risk in areas such as Commercial Real Estate and Leverage Lending portfolio.

Private Bank's risk profile comprises business with German retail, international retail and business clients as well as wealth management clients generating credit risks as well as non-trading market risks from investment risk, modelling of client deposits and credit spread risk. The economic capital demand for the Private Bank decreased by € 0.1 billion in comparison to year-end 2021 mainly driven by € 0.2 billion lower credit risk due to diversification effects and improved book quality. This was partially offset by higher market risk of € 0.1 billion from the changed interest rate environment affecting private client's loans and deposits.

Asset Management, as a fiduciary asset manager, invests money on behalf of clients. As such, the main risk drivers are non-financial. The economic capital demand for market risk is mainly driven by non-trading market risks, which arise from guaranteed products and co-investments in the funds. The economic capital demand for Asset Management increased by € 0.1 billion compared to previous year primarily driven by reduced diversification impact.

Capital Release Unit continued to exit and run down non-strategic assets over 2022. The de-risking across risk types achieved throughout the year led to a reduction in economic capital demand of € 0.3 billion compared to year-end 2021. This decrease was partially offset by a lower diversification benefit from the portfolio reduction.

Corporate & Other's risk profile mainly comprises non-trading market risk from structural foreign exchange risk, pension risk, equity compensation risk and interest rate risk from Treasury, credit risk from Treasury's investments, as well as strategic risk from tax redetermination risk, software assets-related risks and a capital charge related IFRS deferred tax assets on temporary differences. The economic capital demand for Corporate & Other decreased by € 0.5 billion in comparison to year-end 2021 due to reduction in market risk and strategic risk partly offset by increase in credit risk. The economic capital demand for strategic risk decreased by € 1 billion due to the implementation of a model enhancement for software assets, lower deferred tax assets on temporary differences and a decrease in tax re-determination risk. The economic capital demand for market risk decreased by € 0.8 billion driven by reduced credit exposure in the Group's defined benefit pension plan assets, lower equity risk arising from the share-based compensation plans and a reduction in cross currency basis risk. This was partially offset by increase in credit risk of € 1.3 billion mainly driven by higher exposures in Deutsche Bank's government bond portfolio.

Risk and capital framework

Risk management principles

Deutsche Bank's business model inherently involves taking risks. Risks can be financial and non-financial and include on and off-balance sheet risks. Deutsche Bank's objective is to create sustainable value in the interests of the company taking into consideration shareholders, employees and other company related stakeholders. The risk management framework contributes to this by aligning planned and actual risk taking with risk appetite as expressed by the Management Board, while being in line with available capital and liquidity.

Deutsche Bank's risk management framework consists of various components, which include the established internal control mechanisms. Principles and standards are set for each component:

- Organizational structures must follow the Three Lines of Defense ("3LoD") model with a clear definition of roles and responsibilities for all risk types
- The 1st Line of Defense ("1st LoD") refers to those roles in the Bank whose activities generate risks, whether financial or non-financial, and who own and are accountable for these risks. The 1st LoD manages these risks within the defined risk appetite, establishes an appropriate risk governance and risk culture, and adheres to the risk type frameworks defined by the 2nd Line of Defense ("2nd LoD")
- The 2nd LoD refers to the roles in the Bank who define the risk management framework for a specific risk type. The 2nd LoD independently assesses and challenges the implementation of the risk type framework and adherence to the risk appetite, and acts as an advisor to the 1st LoD on how to identify, assess and manage risks.
- The 3rd Line of Defense ("3rd LoD") is Group Audit, which is accountable for providing independent and objective assurance on the adequacy of the design, operating effectiveness and efficiency of the risk management system and systems of internal control
- Every employee must act as a risk manager consistent with the bank's risk appetite, risk management standards and values
- The Management Board approved risk appetite must be cascaded and adhered to across all dimensions of the Group, with appropriate consequences in the event of a breach
- Risks must be identified and assessed
- Risks must be actively managed including appropriate risk mitigation and effective internal control systems
- Risks must be measured and reported using accurate, complete and timely data using approved models
- Regular stress tests must be performed against adverse scenarios and appropriate crisis response planning must be established

The Group promotes a strong risk culture where every employee must fully understand and take a holistic view of the risks which could result from their actions, understand the consequences and manage them appropriately against the risk appetite of the bank. The bank expects employees to exhibit behaviors that support a strong risk culture in line with the bank's Code of Conduct. To promote this, Deutsche Bank's policies require that risks taken (including against risk appetite) must be taken into account during the bank's performance assessment and compensation processes. This expectation continues to be reinforced through communications campaigns and mandatory training courses for all DB employees. In addition, Management Board members and senior management frequently communicate the importance of a strong risk culture to support a consistent tone from the top.

Deutsche Bank's risk management and internal control system is described in more detail in Deutsche Bank's Pillar 3 report (specifically in the section "Risk management objectives and policies, Enterprise Risk"). The risk management and internal control system also covers sustainability-related objectives (as outlined in the Non-Financial Report 2022, specifically in the chapters "Sustainability strategy and implementation" and "Climate risk").

The Management Board is of the opinion that a risk management framework and internal control system has been established which is, in its entirety, appropriate and effective for the bank's business model and risk profile.

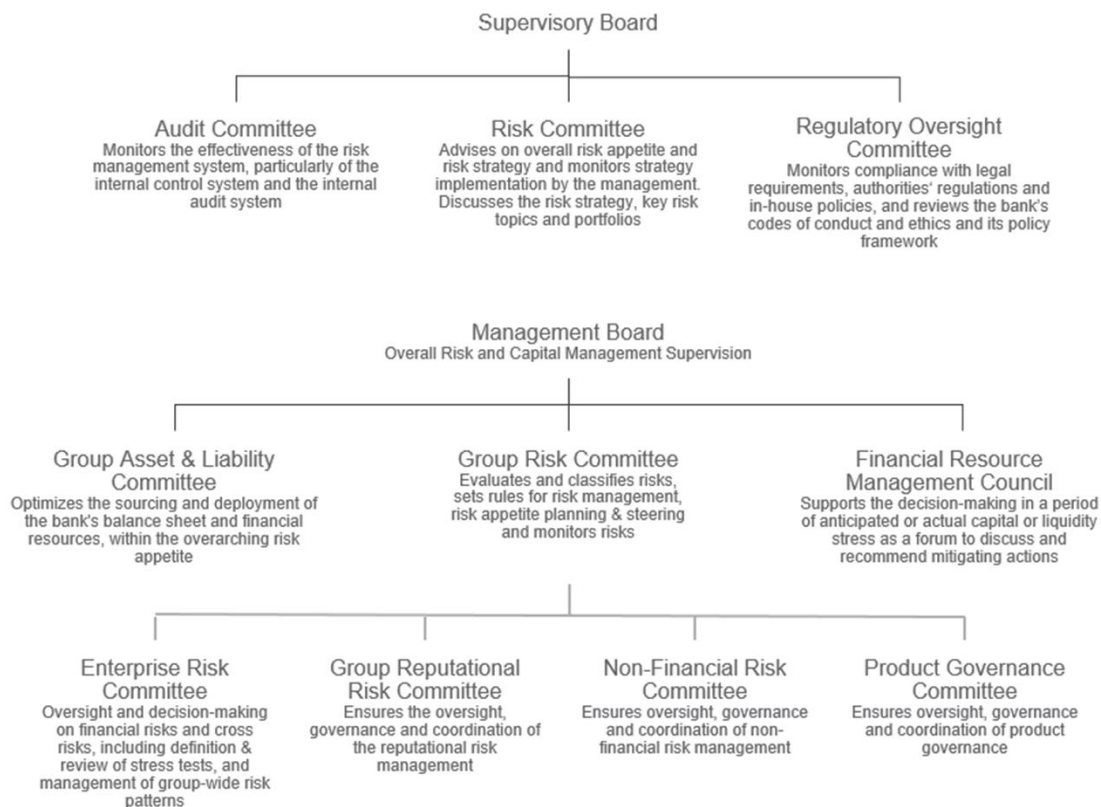
Risk governance

Deutsche Bank's operations throughout the world are regulated and supervised by relevant authorities in each of the jurisdictions in which the bank conducts business. Such regulation focuses on licensing, capital adequacy, liquidity, risk concentration, conduct of business as well as organizational and reporting requirements. The European Central Bank (ECB) in connection with the competent authorities of EU countries which joined the Single Supervisory Mechanism via the Joint Supervisory Team act in cooperation as Deutsche Bank's primary supervisors to monitor the bank's compliance with the German Banking Act and other applicable laws and regulations.

Several layers of management provide cohesive risk governance:

- Deutsche Bank's Supervisory Board is informed regularly on the risk situation, risk management and risk controlling, including reputational risk related items as well as material litigation cases; it has formed various committees to handle specific topics (for a detailed description of these committees, please see the "Corporate Governance Report" under "Management Board and Supervisory Board", "Standing Committees")
- At the meetings of the Risk Committee, the Management Board reports on current and forward-looking risk exposures, portfolios, on risk appetite and strategy and on matters deemed relevant for the assessment and oversight of the risk situation of Deutsche Bank AG; it also reports on loans requiring a Supervisory Board resolution pursuant to law or the Articles of Association; the Risk Committee advises on issues related to the overall risk appetite, aggregate risk position and the risk strategy and keeps the Supervisory Board informed of its activities
- The Regulatory Oversight Committee, among other responsibilities, monitors the Management Board's measures that promote the company's compliance with legal requirements, authorities' regulations and the company's own policies; it also reviews the bank's codes of conduct and ethics as well as its policy framework, and, upon request, supports the Risk Committee in monitoring and analyzing the bank's legal and reputational risks; the Management Board informs the committee about contacts with regulators with a significant relevance for the business activity
- The Audit Committee, among other matters, supports the Supervisory Board in monitoring the effectiveness of the risk management system, particularly the internal control system and the internal audit system, as well as the Management Board's remediation of deficiencies identified
- The Management Board is responsible for managing Deutsche Bank Group in accordance with the law, the Articles of Association and its Terms of Reference with the objective of creating sustainable value in the interest of the company, thus taking into consideration the interests of the shareholders, employees and other company related stakeholders; the Management Board is responsible for ensuring a proper business organization, encompassing appropriate and effective risk management, as well as compliance with legal requirements and internal guidelines; the Management Board established the Group Risk Committee as the central forum for review and decision on material risk and capital-related topics; the Group Risk Committee generally meets once a week; it has delegated some of its duties to individuals and sub-committees; the Group Risk Committee and its sub-committees are described in more detail below

Risk management governance structure of the Deutsche Bank Group



The following functional committees are central to the management of risk at Deutsche Bank:

- The Group Risk Committee has various duties and dedicated authority, including approval of new or changed material risk and capital models and review of the inventory of risks, high-level risk portfolios, risk exposure developments, and internal and regulatory Group-wide stress testing results; in addition, the Group Risk Committee reviews and recommends items for Management Board approval, such as key risk management principles, the Group risk appetite statement, the Group recovery plan and the contingency funding plan, over-arching risk appetite parameters, and recovery and escalation indicators; the Group Risk Committee also supports the Management Board during Group-wide risk and capital planning processes
- The Non-Financial Risk Committee oversees, governs and coordinates the management of non-financial risks in Deutsche Bank Group and establishes a cross-risk and holistic perspective of the key non-financial risks of the Group, including conduct and financial crime risk; it is tasked to define the non-financial risk appetite tolerance framework, to monitor and control the effectiveness of the non-financial risk operating model (including interdependencies between business divisions and control functions), and to monitor the development of emerging non-financial risks relevant for the Group
- The Group Reputational Risk Committee is responsible for the oversight, governance and coordination of reputational risk management and provides for a look-back and a lessons learnt process; matters are referred to the Group Reputational Risk Committee in exceptional circumstances – this may be the case if a matter is declined by the Regional Reputational Risk Committee and appealed by the business division, or if the Regional Reputational Risk Committee cannot reach a two-thirds majority decision; it provides guidance on Group-wide reputational risk matters, including communication of sensitive topics, to the appropriate levels of Deutsche Bank Group; the Regional Reputational Risk Committees which are sub-committees of the Group Reputational Risk Committee, are responsible for the oversight, governance and coordination of the management of reputational risk in the respective regions on behalf of the Management Board
- The Enterprise Risk Committee has been established with a mandate to focus on enterprise-wide risk trends, events and cross-risk portfolios, bringing together risk experts from various risk disciplines; as part of its mandate, the Enterprise Risk Committee approves the group risk inventory, certain country and industry threshold increases, and scenario design outlines for more severe group-wide stress tests as well as reverse stress tests; it reviews group-wide stress test results in accordance with risk appetite, reviews the risk outlook, emerging risks and topics with enterprise-wide risk implications; it oversees the climate and environmental risk framework
- The Product Governance Committee has the mandate to ensure that there is appropriate oversight, governance and coordination of product governance in the Group by establishing a cross-risk and holistic perspective of key financial and non-financial risks associated with products and transactions throughout the lifecycle
- The Financial Resource Management Council is an ad-hoc governance body, chaired by the Chief Financial Officer and the Chief Risk Officer, with delegated authority from the Management Board, to oversee financial crisis management at the bank; the Financial Resource Management Council provides a single forum to oversee execution of both the contingency funding plan and the Group recovery plan; the council recommends upon mitigating actions to be taken in a time of anticipated or actual capital or liquidity stress; specifically, the Financial Resource Management Council is tasked with analyzing the bank's capital and liquidity position, in anticipation of a stress scenario recommending proposals for capital and liquidity related matters and overseeing the execution of decisions
- The Group Asset & Liability Committee has been established by the Management Board with the mandate to optimize the sourcing and deployment of the bank's balance sheet and financial resources within the overarching risk appetite set by the Management Board

Deutsche Bank's Chief Risk Officer, who is a member of the Management Board, has Group-wide, supra-divisional responsibility for establishing a risk management framework with appropriate identification, measurement, monitoring, mitigation and reporting of liquidity, credit, market, enterprise, model and non-financial risks (including operational and reputational); however, frameworks for certain risks are established by other functions as per the business allocation plan.

The Chief Risk Officer has direct management responsibility for the Chief Risk Office function. Risk management and control duties in the Chief Risk Office function are generally assigned to specialized risk management units focusing on the management of

- Specific risk types
- Risks within a specific business
- Risks in a specific region.

These specialized risk management units generally handle the following core tasks:

- Foster consistency with the risk appetite set by the Management Board and applied to business divisions and their business units
- Determine and implement risk and capital management policies, procedures and methodologies that are appropriate to the businesses within each division
- Establish and approve risk limits
- Conduct periodic portfolio reviews to keep the portfolio of risks within acceptable parameters
- Develop and implement risk and capital management infrastructures and systems that are appropriate for each division

Chief Risk Officers for each business division as well as each region, having a holistic view of the respective business, challenge and influence the divisional and regional strategies, risk awareness and ownership as well as their adherence to risk appetite.

While operating independently from each other and the business divisions, the Finance and Risk functions have the joint responsibility to quantify and verify the risk that the bank assumes.

Risk appetite and capacity

Risk appetite expresses the aggregate level and types of risk that Deutsche Bank is willing to assume to achieve strategic objectives, as defined by a set of quantitative metrics and qualitative statements. Risk capacity is defined as the maximum level of risk that can be assumed given Deutsche Bank's capital and liquidity base, risk management and control capabilities, and regulatory constraints.

Risk appetite is an integral element in business planning processes via risk strategy and plan, to promote the appropriate alignment of risk, capital and performance targets, while at the same time considering risk capacity and appetite constraints from both financial and non-financial risks. Compliance of the plan with risk appetite and capacity is also tested under stressed market conditions. Top-down risk appetite serves as the limit for risk-taking for the bottom-up planning from the business functions.

The Management Board reviews and approves risk appetite and capacity on an annual basis, or more frequently in the event of unexpected changes to the risk environment, with the aim of ensuring that they are consistent with the Group's strategy, business and regulatory environment and stakeholders' requirements.

In order to determine risk appetite and capacity, different group level triggers and thresholds on a forward-looking basis are set and the escalation requirements for further action are defined. Deutsche Bank assigns risk metrics that are sensitive to the material risks to which Deutsche Bank is exposed and which function as indicators of financial health. In addition to that, the risk and recovery management framework is linked with the risk appetite framework.

Reports relating to risk profile as compared to Deutsche Bank's risk appetite and strategy and the monitoring thereof are presented regularly up to the Management Board. In the event that desired risk appetite is breached, a predefined escalation governance matrix is applied so these breaches are highlighted to the appropriate governance bodies.

Risk and capital plan

Strategic and capital plan

Deutsche Bank conduct annually an integrated strategic planning process which lays out the development of our future strategic direction for the Group and for the business areas. The strategic plan aims to create a holistic perspective on capital, funding and risk under risk-return considerations. This process translates long-term strategic targets into measurable short- to medium-term financial targets and enables intra-year performance monitoring and management. Thereby the Group aims to identify growth options by considering the risks involved and the allocation of available capital resources to drive sustainable performance. Risk-specific portfolio strategies complement this framework and allow for an in-depth implementation of the risk strategy on portfolio level, addressing risk specifics including risk concentrations.

The strategic planning process consists of two phases: a top-down target setting and a bottom-up substantiation.

In a first phase – the top-down target setting – Deutsche Bank's key targets for profit and loss (including revenues and costs), capital supply, capital demand as well as leverage, funding and liquidity are discussed for the group and the key business areas. In this process, the targets for the next five years are based on the global macro-economic outlook and the expected regulatory framework. Subsequently, the targets are approved by the Management Board.

In a second phase, the top-down objectives are substantiated bottom-up by detailed business unit plans, which consist of a month by month operative plan for year one; years two and three are planned per quarter and years four and five are annual plans. The proposed bottom-up plans are reviewed and challenged by Finance and Risk and are discussed individually with the business heads. Thereby, the specifics of the business are considered and concrete targets decided in line with the bank's strategic direction. The bottom-up plans include targets for key legal entities to review local risk and capitalization levels. Stress tests complement the strategic plan to also consider stressed market conditions.

The resulting Strategic and Capital Plan is presented to the Management Board for discussion and approval. The final plan is presented to the Supervisory Board.

The Strategic and Capital Plan is designed to support our vision of being a leading German bank with strong European roots and a global network and aims to ensure:

- Balanced risk adjusted performance across business areas and units
- High risk management standards with focus on risk concentrations
- Compliance with regulatory requirements
- Strong capital and liquidity position
- Stable funding and liquidity strategy allowing for business planning within the liquidity risk appetite and regulatory requirements

The Strategic and Capital Planning process allows us to:

- Set earnings and key risk and capital adequacy targets considering the bank's strategic focus and business plans
- Assess our capital adequacy with regard to internal and external requirements (i.e., economic capital and regulatory capital)
- Apply appropriate stress test analyses' to assess the impact on capital demand, capital supply and liquidity

All externally communicated financial targets are monitored on an ongoing basis in appropriate management committees. Any projected shortfall versus targets is discussed together with potential mitigating strategies with the aim to ensure that we remain on track to achieve our targets. Amendments to the strategic and capital plan must be approved by the Management Board. Achieving our externally communicated solvency targets ensures that we also comply with the solvency ratio-related Group Supervisory Review and Evaluation Process (SREP) requirements as articulated by our home supervisor.

In February 2022, the ECB informed Deutsche Bank of its decision effective March 1, 2022 that the bank's Pillar 2 requirement remains unchanged compared to 2021. This results in ECB's Pillar 2 requirement to 2.50% of RWA. As of December 31, 2022, Deutsche Bank needs to maintain on a consolidated basis a CET 1 ratio of at least 10.48%, a Tier 1 ratio of at least 12.45% and a Total Capital ratio of at least 15.07%. The CET 1 requirement comprises the Pillar 1 minimum capital requirement of 4.50%, the Pillar 2 requirement (SREP add-on) of 1.41%, the capital conservation buffer of 2.50%, the countercyclical buffer (subject to changes throughout the year) of 0.07% and the higher of our G-SII/O-SII buffer of 2.00%. Correspondingly, the Tier 1 capital requirement includes additionally a Tier 1 minimum capital requirement of 1.50% plus a Pillar 2 requirement of 0.47%, and the Total Capital requirement includes further a Tier 2 minimum capital requirement of 2.00% and a Pillar 2 requirement of 0.63%. Also, the ECB communicated to Deutsche Bank that its individual expectation to hold a further Pillar 2 CET 1 capital add-on, commonly referred to as 'Pillar 2 guidance' will be seen as guidance only and until at least year-end 2022, a breach of this guidance will not trigger the need to provide a capital restoration plan or a need to execute measures to re-build CET 1 capital.

On December 22, 2022, Deutsche Bank was informed by the ECB of its decision regarding prudential minimum capital requirements for 2023 that applied from January 1, 2023 onwards, following the results of the 2022 SREP. The decision set ECB's Pillar 2 requirement to 2.70% of RWA, effective as of January 1, 2023, of which at least 1.52% must be covered by CET 1 capital and 2.03% by Tier 1 capital.

In January 2022, the BaFin announced a countercyclical buffer of 0.75% for Germany effective February 1, 2023, which translates into approximately 30bps CET 1 capital requirement for Deutsche Bank Group given the current share of German credit exposures. Additionally, the BaFin announced a sectoral systemic risk buffer of 2% for German residential real estate exposures effective February 1, 2023, which translates into approximately 20bps CET 1 capital requirement for Deutsche Bank Group considering our current German residential real estate exposure.

Internal capital adequacy assessment process

Deutsche Bank's internal capital adequacy assessment process (ICAAP) consists of several well-established components which ensure that Deutsche Bank maintains sufficient capital to cover the risks to which the bank is exposed on an ongoing basis:

- Risk identification and assessment: The risk identification process forms the basis of the ICAAP and results in an inventory of risks for the Group; all risks identified are assessed for their materiality; further details can be found in section "Risk identification and assessment"
- Capital demand/risk measurement: Risk measurement models are applied to quantify the regulatory and economic capital demand which is required to cover all material risks except for those which cannot be adequately limited by capital e.g. liquidity risk; further details can be found in sections "Risk profile" and "Capital, Leverage Ratio, TLAC and MREL"
- Capital supply: Capital supply quantification refers to the definition of available capital resources to absorb unexpected losses; further details can be found in sections "Capital, Leverage Ratio, TLAC and MREL" and "Economic Capital Adequacy"
- Risk appetite: Deutsche Bank has established a set of qualitative statements, quantitative metrics and thresholds which express the level of risk that Deutsche Bank is willing to assume to achieve strategic objectives; threshold breaches are subject to a dedicated governance framework triggering management actions aimed to safeguard capital adequacy; further details can be found in sections "Risk appetite and capacity" and "Key risk metrics"
- Capital planning: The risk appetite thresholds for capital adequacy metrics constitute boundaries which have to be met in the capital plan to safeguard capital adequacy on a forward-looking basis; further details can be found in section "Strategic and capital plan"
- Stress testing: Capital plan figures are also considered under various stress test scenarios to prove resilience and overall viability of the bank; regulatory and economic capital adequacy metrics are also subject to regular stress tests throughout the year to constantly evaluate Deutsche Bank's capital position in hypothetical stress scenarios and to detect vulnerabilities under stress; further details can be found in section "Stress testing"
- Capital adequacy assessment: Although capital adequacy is constantly monitored throughout the year, the ICAAP concludes with a dedicated annual capital adequacy statement (CAS); the assessment consists of a Management Board statement about Deutsche Bank's capital adequacy, which is linked to specific conclusions and management actions to be taken to safeguard capital adequacy on a forward-looking basis

As part of its ICAAP, Deutsche Bank distinguishes between a normative and economic internal perspective. The normative internal perspective refers to a multi-year assessment of the ability to fulfil all capital-related legal requirements and supervisory demands on an ongoing basis under a baseline and adverse scenario. The economic internal perspective refers to an internal process using internal economic capital demand models and an internal economic capital supply definition. Both perspectives focus on maintaining the continuity of Deutsche Bank on an ongoing basis.

Stress testing

Deutsche Bank has implemented a stress test framework to satisfy internal as well as external stress test requirements. The internal stress tests are based on in-house developed methods and inform a variety of risk management use cases (risk type specific as well as cross risk). Internal stress tests form an integral part of Deutsche Bank's risk management framework complementing traditional risk measures. The cross-risk stress test framework, the Group Wide Stress Test Framework (GWST), serves a variety of bank management processes, in particular the strategic planning process, the ICAAP, the risk appetite framework and capital allocation. Capital plan stress testing is performed to assess the viability of the bank's capital plan in adverse circumstances and to demonstrate a clear link between risk appetite, business strategy, capital plan and stress testing. The regulatory stress tests, e.g. the EBA stress test and the US-based CCAR (Comprehensive Capital Analysis and Review) stress tests, are strictly following the processes and methodologies as prescribed by the regulatory authorities.

Deutsche Bank's internal stress tests are performed on a regular basis in order to assess the impact of a severe economic downturn as well as adverse bank-specific events on the bank's risk profile and financial position. The bank's stress testing framework comprises regular sensitivity-based and scenario-based approaches addressing different severities and regional hotspots. All material risk types are included in the stress testing activities. These activities are complemented by portfolio- and country-specific downside analysis as well as further regulatory requirements, such as annual reverse stress tests and additional stress tests requested by regulators on group or legal entity level. The applied methodologies undergo regular scrutiny from Deutsche Bank's internal validation team (Model Risk Management) whether they correctly capture the impact of a given stress scenario.

The initial phase of Deutsche Bank's cross-risk stress test consists of defining a macroeconomic downturn scenario by ERM Risk Research in cooperation with business specialists through a formal governance forum Scenario Design Council. ERM Risk Research monitors the political and economic development around the world and maintains a macro-economic heat map that identifies potentially harmful scenarios. Based on quantitative models and expert judgments, economic parameters such as foreign exchange rates, interest rates, GDP growth or unemployment rates are set accordingly to reflect the impact on the bank's business. The scenario parameters are translated into specific risk drivers by subject matter experts in the risk units. Based on the bank's internal model framework for stress testing, the following major metrics are calculated under stress: risk-weighted assets, impacts on profit and loss and economic capital by risk type. These results are aggregated at the Group level, and key metrics such as the CET 1 ratio, ECA ratio, MREL ratio and Leverage Ratio under stress are derived. Stress impacts on the Liquidity Coverage Ratio (LCR) and the Liquidity Reserve are also considered. The time-horizon of internal stress tests is between one and five years, depending on the use case and scenario assumptions. The Enterprise Risk Committee (ERC) reviews the final stress results. After comparing these results against the bank's defined risk appetite, the ERC also discusses specific mitigation actions to remediate the stress impact in alignment with the overall strategic and capital plan if certain limits are breached. The results also feed into the recovery planning which is crucial for the recoverability of the bank in times of crisis. The outcome is presented to senior management up to the Management Board to raise awareness on the highest level as it provides key insights into specific business vulnerabilities and contributes to the overall risk profile assessment of the bank.

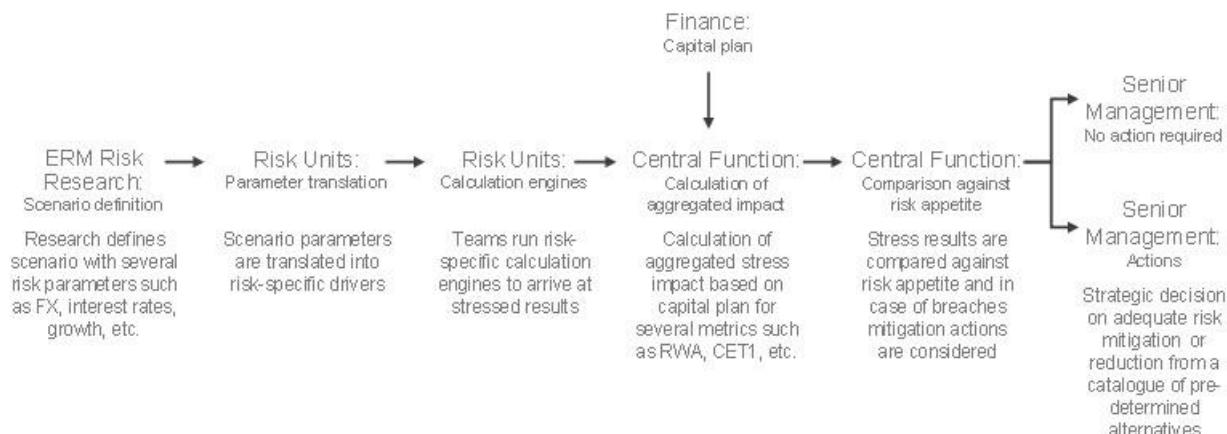
The group wide stress tests performed in 2022 indicated that the bank's capitalization together with available mitigation measures as defined in the Group Recovery Plan allow it to reach the internally set stress exit level.

The cross-risk reverse stress test leverages the GWST framework and is typically performed annually in order to challenge Deutsche Bank's business model by determining scenarios which would cause the bank to become unviable. Such a reverse stress test is based on a hypothetical macroeconomic scenario enriched by idiosyncratic events based on the top risks monitored by each risk type. Comparing the non-viability scenario to the current economic environment, the probability of occurrence of such a hypothetical stress scenario is considered to be extremely low. Given this, it is the bank's view that its business continuity is not at risk.

Starting end of 2020, Deutsche Bank has further strengthened its framework by increasing the frequency of the Risk Appetite scenario to monthly thereby enabling a more rigorous risk appetite monitoring.

In addition to the GWST that includes all material risk types and major revenue streams, Deutsche Bank has individual stress test programs in place for all relevant risk metrics in line with regulatory requirements. The relevant stress test programs are described in the sections about the individual risk management methods.

GWST framework of Deutsche Bank Group



Deutsche Bank also took part in the US-based CCAR stress test, as implemented pursuant to the US Dodd-Frank Act. The Federal Reserve (FRB) publicly disclosed the stress capital depletion for DB USA Corporation and DWS USA Corporation; this showed that each entity remains very well-capitalized even after withstanding a hypothetical severe stress environment.

In 2022, the bank participated in the inaugural ECB Climate risk Stress Test (CST22) aiming to assess European banks' climate risk stress test capabilities and their vulnerabilities to transition and physical risks under certain assumptions and a range of climate scenarios. The result of CST22 had no direct capital implications but feeds into the annual SREP assessment in a qualitative way.

Risk measurement and reporting systems

Deutsche Bank's risk measurement systems support regulatory reporting and external disclosures, as well as internal management reporting across credit, market, liquidity, operational, reputational, enterprise and model risks. The risk infrastructure incorporates the relevant legal entities and business divisions and provides the basis for reporting on risk positions, capital adequacy and limit, threshold or target utilization to the relevant functions on a regular and ad-hoc basis. Established units within the CFO and CRO-Function assume responsibility for measurement, analysis and reporting of risk while promoting sufficient quality and integrity of risk-related data. The Group's risk management systems are reviewed by Group Audit following a risk-based audit approach.

Deutsche Bank's reporting is an integral part of Deutsche Bank's risk management approach and as such aligns with the organizational setup by delivering consistent information on Group level and for material legal entities as well as breakdowns by risk types, business division and material business units.

The following principles guide Deutsche Bank's "risk measurement and reporting" practices:

- Deutsche Bank monitors risks taken against risk appetite and risk-reward considerations on various levels across the Group, e.g. Group, business divisions, material business units, material legal entities, risk types, material asset classes, portfolio and counterparty levels
- Risk reporting is required to be accurate, clear, useful and complete and must convey reconciled and validated risk data to communicate information in a concise manner to ensure, across material Financial and Non-Financial Risks, the bank's risk profile is clearly understood
- Senior risk committees, such as the Enterprise Risk Committee and the Group Risk Committee, as well as the Management Board who are responsible for risk and capital management receive regular reporting (as well as ad-hoc reporting as required)
- Dedicated teams within Deutsche Bank proactively manage material Financial and Non-Financial Risks and must ensure that required management information is in place to enable proactive identification and management of risks and avoid undue concentrations within a specific Risk Type and across risks (Cross-Risk view)

In applying the previously mentioned principles, Deutsche Bank maintains a common basis for all risk reports and aims to minimize segregated reporting efforts to allow Deutsche Bank to provide consistent information, which only differs by granularity and audience focus.

The Bank identifies a large number of metrics within its risk measurement systems which support regulatory reporting and external disclosures, as well as internal management reporting across risks and for material risk types. Deutsche Bank designates a subset of those as “Key Risk Metrics” that represent the most critical ones for which the Bank places an appetite, limit, threshold or target at Group level and / or are reported routinely to senior management for discussion or decision making. The identified Key Risk Metrics include Capital Adequacy and Liquidity metrics; further details can be found in the section “Key risk metrics”.

While a large number of reports are used across the Bank, Deutsche Bank designates a subset of these as “Key Risk Reports” that are critical to support Deutsche Bank’s Risk Management Framework through the provision of risk information to senior management and therefore enable the relevant governing bodies to monitor, steer and control the Bank’s risk taking activities effectively. To ensure that Key Risk Reports meet recipients’ requirements, report producing functions regularly check whether the Key Risk Reports are clear and useful.

The main reports on risk and capital management that are used to provide Deutsche Bank’s central governance bodies with information relating to the Group risk profile are the following:

- The monthly Risk and Capital Profile report is a Cross-Risk report, provides a comprehensive view of Deutsche Bank’s risk profile and is used to inform the ERC, the Group Risk Committee as well as the Management Board and subsequently the Risk Committee of the Supervisory Board; the Risk and Capital Profile includes Risk Type specific and Business-Aligned overviews and Enterprise-wide risk topics; it also includes updates on Key Group Risk Appetite Metrics and other Key Portfolio Risk Type Control Metrics as well as updates on Key Risk Developments, highlighting areas of particular interest with updates on corresponding risk management strategies
- The Weekly Risk Report is a weekly briefing covering high-level topical issues across key risk areas and is submitted every Friday to the Members of the Enterprise Risk Committee, the Group Risk Committee and the Management Board and subsequently to the Members of the Risk Committee of the Supervisory Board; the Weekly Risk Report is characterized by the ad-hoc nature of its commentary as well as coverage of themes and focuses on more volatile risk metrics
- Deutsche Bank runs several Group-wide macroeconomic stress tests. A monthly Risk Appetite scenario serves the purpose to set and regularly monitor the bank’s stress loss appetite; in addition, there are topical scenarios which are reported to and discussed in the Enterprise Risk Committee and escalated to the Group Risk Committee if deemed necessary; the stressed key performance indicators are benchmarked against the Group Risk Appetite thresholds

While the above reports are used at a Group level to monitor and review the risk profile of Deutsche Bank holistically, there are other, supplementing standard and ad-hoc management reports, including for Risk Types or Focus Portfolios, which are used to monitor and control the risk profile.

Recovery and resolution planning

In the EU, the Single Resolution Mechanism Regulation (SRM Regulation) and the Bank Recovery and Resolution Directive (BRRD) aim at reducing the likelihood of another financial crisis, enhance the resilience of institutions under stress, and eventually support the long-term stability of the financial systems without exposing taxpayers’ money to losses.

In line with the provisions of the SRM Regulation and the BRRD (which were mainly implemented in Germany by the German Recovery and Resolution Act (Sanierungs- und Abwicklungsgesetz – SAG)), Deutsche Bank maintains a recovery and resolution planning framework designed to identify and manage the impact of adverse events in a timely and coordinated manner.

The bank drafts and maintains a Group recovery plan which is approved by the Management Board. The latest submission in 2022 includes, inter alia:

- Updated overall recovery capacity which has been assessed against four severe stress scenarios and is deemed sufficient to withstand severe capital and liquidity stress
- All Recovery metrics levels have been aligned to the new Group risk appetite and new early warning metrics have been added

The Group resolution plan on the other hand is prepared by the resolution authorities, rather than by the bank itself. Deutsche Bank works closely with the Single Resolution Board and the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) who establish the Group resolution plan for Deutsche Bank, which is currently based on a single point of entry bail-in as the preferred resolution strategy. Under the single point of entry bail-in strategy, the parent entity Deutsche Bank AG would be recapitalized through a write-down and/or conversion to equity of capital instruments (Common Equity Tier 1, Additional Tier 1, Tier 2) and other eligible liabilities in order to stabilize the Group. Within one month after the application of the bail-in tool to recapitalize an institution, the BRRD (as implemented in the SAG) requires such institution to prepare a business reorganization plan, addressing the causes of failure and aiming to restore the institution's long-term viability. To further support and improve operational continuity of the bank for resolution planning purposes, DB has largely completed additional preparations, such as adding termination stay clauses into client financial agreements governed by non-EU law and including continuity provisions into key service agreements. Financial contracts and service agreements governed by EU law are already covered by statutory laws which prevent termination solely due to any resolution measure.

The BRRD requires banks in EU member states to maintain minimum requirements for own funds and eligible liabilities to make resolution credible by establishing sufficient loss absorption and recapitalization capacity. Apart from MREL-requirements, Deutsche Bank, as a global systemically important bank, is subject to global minimum standards for Total Loss-Absorbing Capacity, which set out strict requirements for the amount and eligibility of instruments to be maintained for bail-in purposes. In particular, TLAC instruments must be subordinated (including so-called senior non-preferred debt, but also in the form of regulatory capital instruments) to other senior liabilities. This ensures that a bail-in would be applied first to equity and TLAC instruments, which must be exhausted before a bail-in may affect other senior (preferred) liabilities such as senior preferred plain vanilla bonds, debt instruments that are structured, deposits and derivatives.

In the United States, Deutsche Bank AG is required under Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the Dodd-Frank Act), as amended, to prepare and submit to the Federal Reserve Board and the Federal Deposit Insurance Corporation (FDIC) either a full or targeted resolution plan (the U.S. Resolution Plan) on a timeline prescribed by such agencies. The U.S. Resolution Plan must demonstrate that the Deutsche Bank AG has the ability to execute and implement a strategy for the orderly resolution of its designated U.S. material entities and operations. For foreign-based companies subject to these resolution planning requirements such as Deutsche Bank AG, the U.S. Resolution Plan relates only to subsidiaries, branches, agencies and businesses that are domiciled in or whose activities are carried out in whole or in material part in the United States. Deutsche Bank's U.S. Resolution Plan describes the single point of entry strategy for Deutsche Bank's U.S. material entities and operations and prescribes that DB USA Corporation, one of the bank's intermediate holding companies, would provide liquidity and capital support to its U.S. material entity subsidiaries and ensure their solvent wind-down outside of applicable resolution proceedings.

By December 17, 2021, Deutsche Bank filed its first 'targeted' 2021 U.S. Resolution Plan, which described the core elements of Deutsche Bank's U.S. resolution strategy — such as capital, liquidity, and recapitalization strategies — as well as how Deutsche Bank has integrated lessons learned from its response to the COVID-19 pandemic into its resolution planning process. On December 16, 2022, the Federal Reserve Board and the FDIC announced the results of their review of Deutsche Bank's 2021 U.S. Resolution Plan, as well as those of other banks, and did not find any shortcomings or deficiencies in Deutsche Bank's plan. In their feedback letter to Deutsche Bank, the agencies noted areas where further progress will help improve resolvability, which Deutsche Bank must address in its next full resolution plan submission, which is due on July 1, 2024.

Risk and Capital Management

Capital management

Deutsche Bank's Treasury function manages solvency, capital adequacy, leverage, and bail-in capacity ratios at Group level and locally in each region, as applicable. Treasury implements Deutsche Bank's capital strategy, which itself is developed by the Group Risk Committee and approved by the Management Board. Treasury, directly or through the Group Asset and Liability Committee, manages, among other things, issuance and repurchase of shares and capital instruments, hedging of capital ratios against foreign exchange swings, setting capacities for key financial resources, the design of shareholders' equity allocation, and regional capital planning. The bank is fully committed to maintaining Deutsche Bank's sound capitalization both from an economic and regulatory perspective considering both book equity based on IFRS accounting standards, regulatory and economic capital as well as specific capital requirements from rating agencies. The bank continuously monitors and adjusts Deutsche Bank's overall capital demand and supply to always achieve an appropriate balance.

Treasury manages the issuance and repurchase of capital instruments, namely Common Equity Tier 1, Additional Tier 1 and Tier 2 capital instruments as well as TLAC/MREL eligible debt instruments. Treasury constantly monitors the market for liability management trades. Such trades represent a countercyclical opportunity to create Common Equity Tier 1 capital by buying back Deutsche Bank's issuances below par.

Treasury manages the sensitivity of Deutsche Bank's CET 1 ratio and capital towards swings in foreign currency exchange rates against the euro. For this purpose, Treasury develops and executes suitable hedging strategies within the constraints of a Management Board approved Risk Appetite. Capital invested into Deutsche Bank's foreign subsidiaries and branches is either not hedged, partially hedged or fully hedged. Thereby, Treasury aims to balance effects from foreign exchange rate movements on capital, capital deduction items and risk weighted assets in foreign currency. In addition, Treasury also accounts for associated hedge cost and implications on market risk weighted assets.

Resource limit setting

Usage of key financial resources is influenced through the following governance processes and incentives.

Target resource capacities are reviewed in Deutsche Bank's annual strategic plan in line with Deutsche Bank's CET 1 and Leverage Ratio ambitions. As a part of Deutsche Bank's quarterly process, the Group Asset and Liability Committee approves divisional resource limits for total capital demand (defined as the sum of RWA and certain RWA equivalents of Capital Deduction Items) and leverage exposure that are based on the strategic plan but adjusted for market conditions and the short-term outlook. Limits are enforced through a close monitoring process and an excess charging mechanism.

Overall regulatory capital requirements are principally driven by either Deutsche Bank's CET 1 ratio (solvency) or leverage ratio (leverage) requirements, whichever is the more binding constraint. For the internal capital allocation, the combined contribution of each segment to the Group's Common Equity Tier 1 ratio, the Group's Leverage ratio and the Group's Capital Loss under Stress are weighted to reflect their relative importance and level of constraint to the Group. Contributions to the Common Equity Tier 1 ratio and the Leverage ratio are measured through RWA and Leverage Ratio Exposure (LRE). The Group's Capital Loss under Stress is a measure of the Group's overall economic risk exposure under a defined stress scenario. Goodwill, other intangible assets, and business-related regulatory capital deduction items included in total capital demand are directly allocated to the respective segments, supporting the calculation of the allocated tangible shareholders equity and the respective rate of return.

Most of Deutsche Bank's subsidiaries and several of Deutsche Bank's branches are subject to legal and regulatory capital requirements. In developing, implementing, and testing Deutsche Bank's capital and liquidity position, the bank fully takes such legal and regulatory requirements into account. Any material capital requests of Deutsche Bank's branches and subsidiaries across the globe are presented to and approved by the Group Investment Committee prior to execution.

Further, Treasury is a member of Deutsche Bank's Pensions Committee and represented in relevant Investment Committees overseeing the management of the assets of the largest Deutsche Bank pension funds in Germany. These investment committees set the investment strategy for these funds in line with the bank's investment objective to protect the capital base and distribution capacity of the bank.

Risk identification and assessment

Risks to Deutsche Bank's businesses and infrastructure functions, including under stressed conditions, are regularly identified. This assessment incorporates input from both 1st LoD and 2nd LoD, with the identified risks assessed for materiality based on their severity and likelihood of materialization. The assessment of risks is complemented by a view on emerging risks applying a forward-looking perspective. This risk identification and assessment process results in the risk inventory which captures the material risks for the Group, and where relevant, across businesses, entities and branches.

Regular updates to the risk inventory are reported to senior management for review and challenge, and subsequently inform key risk management processes. These include the development of stress scenarios tailored to Deutsche Bank's risk profile, and informing risk appetite setting and monitoring. Risks in the inventory are also mapped to risks in the risk type taxonomy.

Credit Risk Management and Asset Quality

Credit risk framework

Credit risk arises from all transactions where actual, contingent or potential claims against any counterparty, borrower, obligor or issuer (which Deutsche Bank refers to collectively as "counterparties") exist, including those claims that Deutsche Bank plans to distribute; these transactions are typically part of the bank's non-trading lending activities (such as loans and contingent liabilities) as well as the bank's direct trading activity with clients (such as OTC derivatives); these also include traded bonds and debt securities; carrying values of equity investments are also disclosed in the bank's Credit Risk section. Deutsche Bank manages the respective positions within the bank's market risk and credit risk frameworks.

Based on the Risk Type Taxonomy, credit risk is grouped into four material categories, namely default / migration risk, transaction / settlement risk (exposure risk), mitigation risk and credit concentration risk. This is complemented by a regular risk identification and materiality assessment.

- Default / migration risk as the main element of credit risk, is the risk that a counterparty defaults on its payment obligations or experiences material credit quality deterioration increasing the likelihood of a default
- Transaction / settlement risk (exposure risk) is the risk that arises from any existing, contingent or potential future positive exposure
- Mitigation risk is the risk of higher losses due to risk mitigation measures not performing as anticipated
- Credit concentration risk is the risk of an adverse development in a specific single counterparty, country, industry or product leading to a disproportionate deterioration in the risk profile of Deutsche Bank's credit exposures to that counterparty, country, industry or product

Deutsche Bank manages its credit risk using the following philosophy and principles:

- Credit Risk Management (CRM) forms part of the 2nd LoD within DB Group's three Lines of Defense model. Business as primary risk taker and owner forms the 1st LoD and Group Audit the 3rd LoD
- Compliance is reporting to a different Management Board Member and hence the credit risk function is independent from the compliance function up to Management Board level
- In each of the bank's divisions, credit decision standards, processes and principles are consistently applied
- A key principle of credit risk management is client credit due diligence; Deutsche Bank's client selection is achieved in collaboration with the bank's business division counterparts who stand as a first line of defense
- Deutsche Bank aims to prevent undue concentration and tail-risks (large, unexpected losses) by maintaining a diversified credit portfolio; client, industry, country and product-specific concentrations are assessed and managed against the bank's risk appetite
- Deutsche Bank maintains underwriting standards aiming to avoid large undue credit risk on a counterparty and portfolio level; in this regard Deutsche Bank extends also unsecured cash positions and actively use hedging for risk mitigation purposes; additionally, Deutsche Bank strives to secure its derivative portfolio through collateral agreements and may additionally hedge concentration risks to further mitigate credit risks from underlying market movements
- Every new credit facility and every extension (such as exposure limit increase) to any counterparty requires credit approval at the appropriate authority level in line with the minimum required credit authority calculation within an established credit authority grid. Deutsche Bank assigns credit approval authorities to individuals according to their qualifications and experience, and Deutsche Bank reviews these periodically
- Deutsche Bank manages all its credit exposures to each obligor across the bank's consolidated Group on the basis of the "one obligor principle" (as required under Article 4(1)(39) CRR and related regulatory guidance), under which all facilities to a group of borrowers which are linked to each other (for example by one entity holding a majority of the voting rights or capital of another) are consolidated under one group
- Deutsche Bank has established within Credit Risk Management – where appropriate – specialized teams for deriving internal client ratings, analyzing and approving transactions, monitoring the specific portfolios or covering workout clients; for transaction approval purposes, structured credit risk management teams are aligned to the respective lending business areas to ascertain adequate product expertise.
- Where required, Deutsche Bank has established processes to manage credit exposures at a legal entity level
- To meet the requirements of Article 190 CRR, DB Group has allocated the various control requirements for the credit processes to 2nd LoD units that are best suited to perform such controls

Measuring Credit Risk

Credit risk is measured by credit rating, regulatory and internal capital demand and key components mentioned below.

The credit rating is an essential part of the bank's underwriting and credit process and provides – amongst others – a cornerstone for risk appetite determination on a counterparty and portfolio level, credit decision and transaction pricing as well the determination of regulatory capital demand for credit risk. Each counterparty must be rated and each rating has to be reviewed at least annually. Ongoing monitoring of counterparties helps to keep ratings up-to-date. A credit rating is a prerequisite for any credit limit established/ approved. For each credit rating the appropriate rating approach has to be applied and the derived credit rating has to be established in the relevant systems. Different rating approaches have been established to best reflect the specific characteristics of exposure classes, including specific product types, central governments and central banks, institutions, corporates and retail.

Counterparties in the bank's non-homogenous portfolios are rated by Deutsche Bank's independent Credit Risk Management function. Country risk related ratings are provided by ERM Risk Research.

Deutsche Bank's rating analysis is based on a combination of qualitative and quantitative factors. When rating a counterparty Deutsche Bank applies in-house assessment methodologies, scorecards and the bank's 21-grade rating scale for evaluating the creditworthiness of the bank's counterparties.

Changes to existing credit models and introduction of new models are approved by the Regulatory Credit Risk Model Committee (RCRMC) chaired by the Head of Credit Risk Management before the models are used for credit decisions and capital calculation for the first time or before they are significantly changed. Separately, for all material model changes and for new models an approval by Model Risk Management is required. Proposals with high impact are recommended for approval to the Group Risk Committee. Furthermore regulatory approval may also be required. The model validation is performed independently of model development by Model Risk Management. The results of the regular validation processes as stipulated by internal policies are brought to the attention of the RCRMC, even if the validation results do not lead to a change.

Deutsche Bank measures risk-weighted assets to determine the regulatory capital demand for credit risk using “advanced”, “foundation” and “standard” approaches of which “advanced” and “foundation” are approved by the bank’s regulator.

The advanced Internal Ratings Based Approach (IRBA) is the most sophisticated approach available under the regulatory framework for credit risk and allows Deutsche Bank to make use of the bank’s internal credit rating methodologies as well as internal estimates of specific further risk parameters. These methods and parameters represent long-used key components of the internal risk measurement and management process supporting the credit approval process, the economic capital and expected loss calculation and the internal monitoring and reporting of credit risk. The relevant parameters include the probability of default (PD), the loss given default (LGD) and the maturity (M) driving the regulatory risk-weight and the credit conversion factor (CCF) as part of the regulatory exposure at default (EAD) estimation. For the majority of derivative counterparty exposures as well as securities financing transactions (SFT), Deutsche Bank makes use of the internal model method (IMM) in accordance with CRR and SolvV to calculate EAD. For most of the bank’s internal rating systems more than seven years of historical information is available to assess these parameters. Deutsche Bank’s internal rating methodologies aim at point-in-time rather than a through-the-cycle rating, but in line with regulatory solvency requirements, they are calibrated based on long-term averages of observed default rates.

The foundation IRBA is an approach available under the regulatory framework for credit risk allowing institutions to make use of their internal rating methodologies while using pre-defined regulatory values for all other risk parameters. Parameters subject to internal estimates include the PD while the LGD and the CCF are defined in the regulatory framework. Foundation IRBA remains in place for some exposures stemming from ex-Postbank.

Deutsche Bank applies the standardized approach to a subset of its credit risk exposures. The standardized approach measures credit risk either pursuant to fixed risk weights, which are predefined by the regulator, or through the application of external ratings. Deutsche Bank assigns certain credit exposures permanently to the standardized approach in accordance with Article 150 CRR. These are predominantly exposures to the Federal Republic of Germany and other German public sector entities as well as exposures to central governments of other European Member States that meet the required conditions. These exposures make up the majority of the exposures carried in the standardized approach and receive predominantly a risk weight of zero percent. For internal purposes, however, these exposures are subject to an internal credit assessment and fully integrated in the risk management and economic capital processes.

In addition to the above-described regulatory capital demand, Deutsche Bank determines the internal capital demand for credit risk via an economic capital model.

Deutsche Bank calculates economic capital for the default risk, country risk and settlement risk as elements of credit risk. In line with the bank's economic capital framework, economic capital for credit risk is set at a level to absorb with a probability of 99.9% very severe aggregate unexpected losses within one year. Deutsche Bank's economic capital for credit risk is derived from the loss distribution of a portfolio via Monte Carlo Simulation of correlated rating migrations. The loss distribution is modeled in two steps. First, individual credit exposures are specified based on parameters for the probability of default, exposure at default and loss given default. In a second step, the probability of joint defaults is modeled through the introduction of economic factors, which correspond to geographic regions and industries. The simulation of portfolio losses is then performed by an internally developed model, which takes rating migration and maturity effects into account. Effects due to wrong-way derivatives risk (i.e., the credit exposure of a derivative in the default case is higher than in non-default scenarios) are modeled by applying the bank's own alpha factor when deriving the exposure at default for derivatives and securities financing transactions under the CRR. Deutsche Bank allocates expected losses and economic capital derived from loss distributions down to transaction level to enable management on transaction, customer and business level.

Besides the credit rating, which is a key component Deutsche Bank applies for managing the bank's credit portfolio, including transaction approval and the setting of risk appetite, Deutsche Bank establishes credit limits for all credit exposures. Credit limits set forth maximum credit exposures Deutsche Bank is willing to assume over specified periods. In determining the credit limit for a counterparty, Deutsche Bank considers the counterparty's credit quality by reference to its internal credit rating. Credit limits and credit exposures are both measured on a gross and net basis where net is derived by deducting hedges and certain collateral from respective gross figures. For derivatives, Deutsche Bank looks at current market values and the potential future exposure over the relevant time horizon which is based upon the bank's legal agreements with the counterparty. Deutsche Bank also takes into consideration the risk-return characteristics of individual transactions and portfolios. Risk-return metrics explain the development of client revenues as well as capital consumption.

IFRS 9 Impairment

In the following chapter, the Group provides an overview of the IFRS 9 impairment framework and how it is embedded into Deutsche Bank's credit risk management activities. The first section provides a description of the Group's IFRS 9 model and methodology, along with the key model assumptions. In light of the current macroeconomic environment, the disclosure continues by highlighting key areas of focus in 2022 and how Deutsche Bank assessed the latest developments in its ECL calculation, and in particular, how the model properly took into account the impacts of the uncertainties noted in 2022 and at year end, along with the impact from reasonable changes in the Group's key assumptions. These credit risk management activities are embedded in the bank's overall control and governance framework for credit risk and governance over its ECL model. These activities include, but are not limited to, regular emerging risk reviews as well as portfolio deep dives, day to day risk management on the level of individual borrowers, as well as regular model validations. In the section Management overlays applied to the IFRS 9 model, the Group presents how it performed reviews of relevant assumptions and inputs to the ECL calculation, including the above key assumptions, and how as part of the model reviews, it assessed potential model imprecision and whether any corrective measures in the form of overlays was necessary. The Group also presents an overview and background on each of the management overlays recorded throughout 2022 and at year end. To provide additional transparency on the impact of reasonable changes to the key assumptions, the Group presents model sensitivities in a separate section, and concludes with the key drivers for the IFRS 9 model results.

Description of IFRS 9 Model and Methodology

The impairment requirements of IFRS 9 apply to all credit exposures that are measured at amortized cost or fair value through other comprehensive income and to off balance sheet lending commitments, such as loan commitments and financial guarantees. For purposes of the bank's impairment approach, the Group refers to these instruments as financial assets.

The Group determines its allowance for credit losses in accordance with IFRS 9 as follows:

- Stage 1 reflects financial assets where it is assumed that credit risk has not increased significantly after initial recognition
- Stage 2 contains all financial assets, that are not defaulted, but have experienced a significant increase in credit risk since initial recognition
- Stage 3 consists of financial assets which deemed to be in default in accordance with Deutsche Bank's policies, which are based on the Capital Requirements Regulation (CRR) Article 178. The Group defines these financial assets as impaired, non-performing and defaulted
- Significant increase in credit risk is determined using quantitative and qualitative information based on the Group's historical experience, credit risk assessment and forward-looking information
- Purchased or Originated Credit-Impaired (POCI) financial assets are assets where at the time of initial recognition there is objective evidence of impairment

The IFRS 9 impairment approach is an integral part of the Group's credit risk management procedures. The estimation of expected credit losses (ECLs) is either performed via the automated, parameter based ECL calculation using the Group's ECL model or determined by credit officers. In both cases, the calculation takes place for each financial asset individually. Similarly, the determination of the need to transfer between stages is made on an individual asset basis. The Group's ECL model is used to calculate the allowance for credit losses for all financial assets in Stage 1 and Stage 2, as well as for Stage 3 in the homogeneous portfolio (i.e. retail and small business loans with similar credit risk characteristics). For financial assets in the bank's non-homogeneous portfolio in Stage 3 and for POCI assets, the allowance for credit losses is determined individually by credit officers.

The Group uses three main components to measure ECL. These are Probability of Default (PD), Loss Given Default (LGD) and Exposure at Default (EAD). The Group leverages existing parameters used for determination of capital demand under the Basel Internal Ratings Based Approach (IRBA) and internal risk management practices as much as possible to calculate ECL. These parameters are adjusted where necessary to comply with IFRS 9 requirements (e.g. use of point in time ratings and removal of downturn add-ons in the regulatory parameters). Incorporating forecasts of future economic variables into the measurement of ECL influences the allowance for credit losses in Stage 1 and 2. In order to calculate lifetime ECL, the Group's calculation derives the corresponding lifetime PDs from migration matrices that reflect economic forecasts.

Stage Determination and Significant Increase in Credit Risk

At initial recognition, financial assets are reflected in Stage 1, unless the financial assets are POCI. If there is a significant increase in credit risk, the financial asset is transferred to Stage 2. A significant increase in credit risk is determined by using rating-related and process-related indicators. The assignment of financial assets to Stage 3 is based on the status of the borrower being in default. If a borrower is in default, then all financial assets of the borrower are transferred to Stage 3.

Rating-related Stage 2 indicators: The Group compares a borrower's lifetime PD at the reporting date with lifetime PD expectations at the date of initial recognition to determine if there has been a significant change in the borrower's PDs and consequently to any of the borrower's transaction in the scope of IFRS 9 impairment. Based on historically observed migration behavior and a sampling of different economic scenarios, a lifetime PD distribution is obtained. A quantile of this distribution, which is defined for each counterparty class, is chosen as the lifetime PD threshold. If the remaining lifetime PD of a transaction according to current expectations exceeds this threshold, the financial asset has incurred a significant increase in credit risk and is transferred to Stage 2. The quantiles used to define Stage 2 thresholds are determined using expert judgment, are validated annually and have not changed since implementation of IFRS 9. The thresholds applied vary depending on the original credit quality of the borrower, elapsed lifetime, remaining lifetime and counterparty class. Management believes that the defined approach and quantiles represent a meaningful indicator that a financial asset has incurred a significant increase in credit risk.

Process-related Stage 2 indicators are derived via the use of existing risk management indicators, which in the bank's view represent situations where the credit risk of financial assets has significantly increased. These include borrowers being added to a credit watchlist, being transferred to workout status, payments being 30 days or more past due or being in forbearance. As long as the conditions for one or more of the process-related or rating-related indicators is fulfilled and the borrower of the financial asset has not met the definition of default, the asset will remain in Stage 2. If the Stage 2 indicators are no longer fulfilled and the financial asset has not defaulted, the financial asset transfers back to Stage 1. In case of performing forborene financial assets, the probation period is 2 years before the financial asset is reclassified to Stage 1, which is aligned with regulatory guidance.

If the borrower defaults, all transactions of the borrower are allocated to Stage 3. If at a later date the borrower is no longer in default, the curing criteria according to regulatory guidance is applied (including probation periods), which are at least 3 months or 1 year in case of distressed restructurings. Once the regulatory cure period or criteria has been met, the borrower will cease to be classified as defaulted and will be transferred back to Stage 2 or Stage 1.

The ECL calculation for Stage 3 distinguishes between transactions in homogeneous and non-homogeneous portfolios, and POCI financial assets. For transactions that are in Stage 3 and in a homogeneous portfolio, the Group uses a parameter based automated approach to determine the credit loss allowance per transaction. For these transactions, the LGD parameters are partially modelled to be time dependent, i.e. consider the declining recovery expectation as time elapses after default. The allowance for credit losses for financial assets in the bank's non-homogeneous portfolios in Stage 3, as well as for POCI assets are determined by credit officers and have to be approved along an established authority grid up to and including the Management Board. This allows credit officers to consider currently available information and recovery expectations specific to the borrowers and the financial assets at the reporting date.

Estimation Techniques for Key Input Factors

The first key input factor in the Group ECL calculation is the one-year PD for borrowers which is derived from the bank's internal rating systems. The Group assigns a PD to each borrower credit exposure based on a 21-grade master rating scale for all of the Group's exposure.

The borrower ratings assigned are derived based on internally developed rating models which specify consistent and distinct customer-relevant criteria and assign a rating grade based on a specific set of criteria as given for a certain customer. The set of criteria is generated from information sets relevant for the respective customer segments including general customer behavior, financial and external data (e.g. credit bureau). The methods in use range from statistical scoring models to expert-based models taking into account the relevant available quantitative and qualitative information. Expert-based models are usually applied for borrowers in the exposure classes "Central governments and central banks", "Institutions" and "Corporates" with the exception of those "Corporates" for which a sufficient data basis is available for statistical scoring models. For the latter as well as for the retail segment statistical scoring or hybrid models combining both approaches are commonly used. Quantitative rating methodologies are developed based on applicable statistical modelling techniques, such as logistic regression.

One-year PDs are extended to multi-year PD curves using through-the-cycle matrices and macroeconomic forecasts. Based on economic scenarios centered around the macroeconomic baseline forecast, through-the-cycle matrices are first transformed into point-in-time rating migration matrices, typically for a two-year period. The calculation of the point-in-time matrices leverages a link between macroeconomic variables and the default and rating behavior of borrowers, which is derived from historical macroeconomic variables (MEVs) and rating time series through regression techniques. In a final step, multi-year PD curves are derived from point-in-time rating migration matrices for periods where reasonable and supportable forecasts are available and extrapolated based on through-the-cycle rating migration matrices beyond those periods.

The second key input into the ECL calculation is the LGD parameter, which is defined as the likely loss intensity in case of a borrower's default. It provides an estimation of the exposure that cannot be recovered in a default event and therefore captures the severity of a loss. Conceptually, LGD estimates are independent of a borrower's probability of default. The LGD models applied in stages 1 and 2, which are based on regulatory LGD models, but adjusted for IFRS 9 requirements (i.e. removal of downturn-add-on and removal of indirect costs of workout), ensure that the main drivers for losses (i.e. different levels and quality of collateralization and customer or product types or seniority of facility) are reflected as risk drivers in LGD estimates. In the bank's LGD models, the Group assigns collateral type specific LGD parameters to the collateralized exposure (collateral value after application of haircuts). The LGD setting for defaulted homogeneous portfolios are partially dependent on time after default and are either calibrated based on the Group's multi-decade loss and recovery experience using statistical methods or for less significant portfolios certain LGD model input parameters (e.g. cure rates) are determined by expert judgement.

The third key input is the exposure at default over the lifetime of a financial asset which is modelled taking into account expected repayment profiles (e.g. linear amortization, annuities, bullet loan structures). Prepayment options are not modelled for all portfolios as they are not deemed material. The bank applies specific credit conversion factors (CCFs) in order to calculate an EAD value. Conceptually, the EAD is defined as the expected amount of the credit exposure to a borrower at the time of its default. In instances where a transaction involves an unused limit, a percentage share of this unused limit is added to the outstanding amount in order to appropriately reflect the expected outstanding amount in case of a borrower's default. This reflects the assumption that for commitments, the utilization at the time of default might be higher than the current outstanding balance. In case a transaction involves an additional contingent component (i.e., guarantees) a further percentage share is applied as part of the CCF model in order to estimate the amount of guarantees drawn in case of default. The calibrations of such parameters are based on internal historical data and are either based on empirical analysis or supported by expert judgement and consider borrower and product type specifics. Where supervisory CCF values need to be applied for regulatory purposes, internal estimates are used for IFRS 9.

Expected Lifetime

IFRS 9 requires the determination of lifetime ECL for which the expected lifetime of a financial asset is a key input factor. Lifetime ECL represent default events over the expected life of a financial asset. The Group measures ECL considering the risk of default over the maximum contractual period (including any borrower's extension options) over which the Group is exposed to credit risk.

Retail overdrafts, credit card facilities and certain corporate revolving facilities typically include both a loan and an undrawn commitment component. The expected lifetime of such on-demand facilities exceeds their contractual life as they are typically cancelled only when the Group becomes aware of an increase in credit risk. The expected lifetime is estimated by taking into consideration historical information and the Group's credit risk management actions such as credit limit reductions and facility cancellation. Where such facilities are subject to an individual review by credit risk management, the lifetime for calculating ECL is 12 months. For facilities not subject to individual review by credit risk management, the bank applies a lifetime for calculating ECL of 24 months.

Interest Rate used in the IFRS 9 model

In the context of the ECL calculation, the Group applies in line with IFRS 9 an approximation of the effective interest rate (EIR), which is usually the contractual interest rate. The contractual interest rate is deemed to be an appropriate approximation, as the interest rate is consistently used in the ECL model, interest recognition and for discounting of the ECL and does not materially differ from the EIR.

Consideration of Collateralization in IFRS 9 Expected Credit Loss Calculation

The ECL model projects the level of collateralization for each point in time in the life of a financial asset. At the reporting date, the model uses the existing collateral distribution process applied in Deutsche Bank's economic capital model. In this model, the liquidation value of each eligible collateral is allocated to relevant financial assets to distinguish between collateralized and uncollateralized parts of each financial asset. In the ECL calculation, the Group subsequently applies the aforementioned LGDs for secured and unsecured exposures to derive the ECL for the secured and unsecured part of the exposure separately.

For personal collateral (e.g. guarantees), the ECL model assumes that the relative level of collateralization remains stable over time. In the case of an amortizing loan, the outstanding exposure and collateral values decrease together over time. For physical collateral (e.g. real estate property), the ECL shall assume that the absolute collateral value remains constant. In case of an amortizing loan, the collateralized part of the exposure increases over time and the loan-to-value decreases accordingly.

Certain financial guarantee contracts are integral to the financial assets guaranteed. In such cases, the financial guarantee is considered as collateral for the financial asset and the benefit of the guarantee is used to mitigate the ECL of the guaranteed financial asset.

Forward Looking Information

Under IFRS 9, the allowance for credit losses is based on reasonable and supportable forward-looking information available without undue cost or effort, which takes into consideration past events, current conditions and forecasts of future economic conditions.

To incorporate forward looking information into the Group's allowance for credit losses, the bank uses two key elements:

- As its base scenario, the Group uses external survey-based macroeconomic forecasts (e.g. consensus views on GDP and unemployment rates). In addition, the scenario expansion model, which has been initially developed for stress testing, is used for forecasting macroeconomic variables that are not covered by external consensus data. All forecasts are assumed to reflect the most likely development of the respective variables. The Group regularly updates its forecasts for macroeconomic factors during the quarter and reviews aspects of potential model imprecision (e.g. MEV parameters outside the historic range used for model calibration, if not already included in the model) as part of an MEV monitoring framework to assess if an overlay is required.
- Statistical techniques are then applied to transform the base scenario projections into a probability distribution of the macroeconomic variables. These scenarios specify deviations from the baseline forecasts. The scenario distribution is then used for deriving multi-year PD curves for different rating and counterparty classes, which are applied in the ECL calculation and in the identification of significant deterioration in credit quality of financial assets as described above in the rating-related Stage 2 indicators

The Group's Risk and Finance Credit Loss Provision Forum monitors the impact of forward-looking information, including the latest macroeconomic variables, on a monthly basis and determines if any additional overlays are required. Although interest rates and inflation are not separately included in the MEVs, the economic impact of these risks is reflected in GDP growth rates, unemployment, equities and credit spreads as higher rates and inflation filter through these forecasts. As of December 31, 2022, the consensus data applied in the ECL model was deemed to have reflected the latest macroeconomic developments and uncertainties in the MEVs and no additional overlays were required.

As described earlier, the Group's approach to reflect macroeconomic variables in the calculation of ECLs is to incorporate forecasts for the next two years, using eight discrete quarterly observations. After the period of eight quarters, the Group constructs forecasts based on macro-economic variables and its historic trends.

The tables below contain the macroeconomic variables included in the application of forward-looking information in the IFRS 9 model as of December 31, 2022 and as of December 31, 2021.

Forward-looking information applied

	December 31, 2022 ^{1 2}	
	Year 1 (4 quarter avg)	Year 2 (4 quarter avg)
Commodity - Gold	1,745.84	1,797.74
Commodity - WTI	90.19	88.79
Credit - CDX Emerging Markets	260.99	239.03
Credit - CDX High Yield	489.77	476.53
Credit - CDX IG	85.33	84.94
Credit - High Yield Index	4.46	4.31
Credit - ITX Europe 125	101.26	96.50
Equity - MSCI Asia	1,178	1,176
Equity - Nikkei	28,427	29,287
Equity - S&P500	3,933	4,011
GDP - Developing Asia	3.95 %	4.60 %
GDP - Emerging Markets	3.31 %	3.94 %
GDP - Eurozone	0.87 %	0.53 %
GDP - Germany	(0.26) %	1.00 %
GDP - Italy	0.32 %	0.68 %
GDP - USA	0.62 %	0.61 %
Real Estate Prices - US CRE Index	352.41	343.97
Unemployment - Eurozone	7.03 %	7.15 %
Unemployment - Germany	3.22 %	3.33 %
Unemployment - Italy	8.24 %	8.53 %
Unemployment - Japan	2.56 %	2.42 %
Unemployment - Spain	13.06 %	12.98 %
Unemployment - USA	4.05 %	4.75 %

¹ MEV as of December 12, 2022 which barely changed until December 30, 2022

² Year 1 equals fourth quarter of 2022 to third quarter of 2023, Year 2 equals fourth quarter of 2023 to third quarter of 2024.

	December 31, 2021 ^{1 2}	
	Year 1 (4 quarter avg)	Year 2 (4 quarter avg)
Commodity - Gold	1,764.58	1,696.51
Commodity - WTI	73.19	68.21
Credit - CDX Emerging Markets	231.80	268.64
Credit - CDX High Yield	353.42	399.62
Credit - CDX IG	59.53	63.98
Credit - High Yield Index	3.95	4.46
Credit - ITX Europe 125	61.37	69.93
Equity - MSCI Asia	1,543	1,514
Equity - Nikkei	29,673	30,764
Equity - S&P500	4,777	5,033
GDP - Developing Asia	3.78 %	6.26 %
GDP - Emerging Markets	3.72 %	5.38 %
GDP - Eurozone	4.67 %	2.91 %
GDP - Germany	3.35 %	2.86 %
GDP - Italy	5.17 %	2.33 %
GDP - USA	4.46 %	2.79 %
Real Estate Prices - US CRE Index	348.86	377.26
Unemployment - Eurozone	7.41 %	7.07 %
Unemployment - Germany	3.13 %	2.83 %
Unemployment - Italy	9.18 %	8.92 %
Unemployment - Japan	2.73 %	2.53 %
Unemployment - Spain	14.26 %	13.66 %
Unemployment - USA	4.05 %	3.68 %

¹ MEV as of 31 December 2021; MEV outside the calibrated range were adjusted either in the model or via a management overlay as discussed further below.

² Year 1 equals fourth quarter of 2021 to third quarter of 2022, Year 2 equals fourth quarter of 2022 to third quarter of 2023.

Focus areas in 2022

Deutsche Bank's macroeconomic environment in 2022 was influenced by geopolitical uncertainty and a substantial increase in energy prices, supply chain disruptions, rising interest rates, inflation, and a deteriorating economic outlook for major economies. However, by the end of fourth quarter 2022, the economic outlook had stabilized as a mild winter reduced energy concerns in Europe, energy prices receded, and expectations that inflation may have peaked in Europe and the U.S. were observed. While the outlook remains challenging, risk of a severe further deterioration has eased significantly.

To ensure that Deutsche Bank's ECL model was taking into account all the uncertainties in the macroeconomic environment throughout 2022, the Group reviewed emerging risks to assess its potential downside and to manage the bank's credit strategy and risk appetite. Overall, the actions taken as a result of these reviews ensured the bank was adequately provisioned for its expected credit losses as of December 31, 2022.

Areas of focus in 2022 included several deep dives into first and second order risks resulting from the war in Ukraine. This included comprehensive analysis of the bank's exposure in Russia and Ukraine, along with the impact of increasing energy prices and inflation on wider portfolios. In the first and second quarter of 2022, most exposures to Russian clients were moved to the watchlist and transferred to Stage 2. The Group's net loan exposure to Ukraine is immaterial (€ 64 million as of December 31, 2022 and € 42 million as of December 31, 2021).

Risks related to the increase in energy prices were managed by closely monitoring industries and geographies sensitive to energy prices (e.g. utilities), along with enhanced engagement with clients in the most vulnerable sectors via surveys and detailed discussions to assess their respective risk profile and the overall impact in such sectors. As a result of these actions, the Group was able to identify if any of these vulnerable exposures experienced a significant increase in credit risk in a timely and pro-active manner. As a result, some client relationships were moved onto the watchlist and into Stage 2.

Overall, Deutsche Bank has a conservative risk profile based on a diversified loan book across geographic regions, businesses and sectors. Deutsche Bank's loan book in Germany amounts to € 235 billion as of December 31, 2022 and the bank's confidence in the portfolio's quality is driven by conservative lending standards and well-diversified exposures. Around 75 % of the German loan book is within the Private Bank and nearly 90 % thereof relates to low-risk German retail mortgages. In the German mortgage market, clients typically lock in fixed rates for 10 or more years, which is reflected in the bank's long-term, fixed rate mortgage portfolio with a loan-to-value of 66 % based on current market values. The bank also benefits from structural elements as e.g. a low maturity profile in 2023 reduces refinancing pressure in Leveraged Lending.

The Group's German corporate loan book is € 63 billion as of December 31, 2022, consisting mainly of trade finance and commercial lending and is diversified across a large number of clients (i.e. the top 15 names account for only 6 % of the portfolio). Credit quality in the German corporate portfolio is high with 71 % of loans rated investment grade and with only 2 % of loan exposures in Stage 3 as of December 31, 2022. The Group believes the ECL model has adequately provisioned for the German retail and corporate loan portfolios as the IFRS 9 model has captured rating downgrades, significant increases in credit risk, e.g. by moving borrowers to the watchlist (Stage 2) when the criteria was met or identified those counterparties meeting the definition of default.

The Group also performed reviews in the Corporate Bank and Investment Bank focusing on vulnerable portfolios and/or counterparties determined as potentially vulnerable to rising interest rates due to higher debt levels and/or low interest coverage ratios. The reviews have been designed to build-in an additional layer of portfolio/counterparty reviews supporting the strong credit governance and processes. In particular, credit officers assessed the potential need for additional structural enhancements or collateralization and whether additional counterparties needed to be added to the credit watchlist based on the above mentioned concerns. These exercises included among others, but not exclusively, Commercial Real Estate (CRE) and the Leveraged Lending portfolios. Deutsche Bank's in focus CRE portfolio amounts to € 33 billion or 7 % of the bank's total loan book and comprises non-recourse lending within the core CRE business units in the Investment Bank and Corporate Bank. The bank's CRE lending activities are mainly first lien mortgage-secured and structured with moderate loan-to-values. 51 % of CRE exposures are in the US, 36 % in Europe and 13 % in Asia and loan originations are primarily focused on assets in liquid regional locations such as top-tier gateway cities. The portfolio is diversified by property type, with the largest concentration of 34 % in office space, while hospitality and retail account for only 12 % and 11 %, respectively. Weighted average LTV is around 61 % in the Investment Bank and 53 % in the Corporate Bank.

The Group's Leveraged Lending Leveraged Debt Capital Market exposure in the Investment Bank's Origination & Advisory portfolio is € 4 billion, representing just 1 % of the bank's total loan book, is well diversified across industry sectors without any undue concentration risks with the top 10 names accounting for 11 % of the portfolio on a gross notional basis. Around 79 % of the exposure is in the form of first line secured credit facilities, mostly of revolving nature and the remaining 21 % is asset based lending, which is almost entirely U.S. based and has a negligible loss history. Where relevant, CRE and Leverage Lending clients were transferred to Stage 2 (e.g. watchlist criteria met) or Stage 3 if in default situation, in line with our well established credit processes.

The Group's loan book exposure to China as of December 31, 2022 was € 6.1 billion or 1 % of the total loan book of which only 7 % and 3 % are in Stage 2 and Stage 3, respectively. The Group reviewed the exposures in China on a more regular basis due to the elevated geopolitical risks and resulted in a further tightening of the Bank's risk appetite to Chinese clients in the most vulnerable sectors and enhanced monitoring where deemed necessary.

Results from the above reviews have been discussed in relevant governance forums such as the Enterprise Risk Committee and the Credit Risk Appetite and Management Forum and relevant actions and measures were taken to mitigate the risks and ensure appropriate ECLs were provisioned. For example, where necessary clients' ratings were updated to reflect the latest macroeconomic developments, clients were moved to the watchlist (Stage 2), forbearance measures have been negotiated, credit limits were reduced and where possible collateralization was increased. Overall, the Group believes based on its day-to-day risk management activities and the deep dives described above it has adequately provided for its ECL provision as of December 31, 2022. However, the section below further considers whether any additional overlays were required as of year end 2022.

Management overlays applied to the IFRS 9 model output

The Group regularly reviews key inputs into the ECL calculation and discusses potential model imprecision to assess the need for corrective measures in the form of overlays. Due to the challenging geopolitical environment in 2022, the Group also considered if there were any uncertainties in the macroeconomic environment not included in the model. In the following section, the Group provides details on its management overlays recorded as of December 31, 2021 and its developments to December 31, 2022.

Development of overlays from December 31, 2021 to December 31, 2022

in € m. (unless stated otherwise)		Overlays as of December 31, 2021	New Overlays	Discontinued overlays	Overlays as of December 31, 2022
Overlay description	Impact on				
Construction Risk following increased prices for building materials	Mortgage portfolios in the Private Bank in Stage 1 and 2	15	0	(15)	0
Model calibration (MEV outside calibrated range of the FLI model)	Financial assets in Stage 1 and 2	56	0	(56)	0
Recalibrations required due to the new Definition of Default	Financial assets primarily in the Private Bank in Stage 3	(57)	(35)	0	(92)
Uncertainty related to Russia/Ukraine ¹	All financial assets in Stage 1 and 2	0	127	(127)	0
Model calibration (WTI oil price Index disabled for one portfolio)	Financial assets in Stage 1 and 2 in the Investment Bank	0	39	(39)	0
Total		14	131	(237)	(92)

¹ The overlay recorded with regards to the uncertainty related to Russia/Ukraine in the first quarter of 2022 in the amount of € 44 million was released in the second quarter 2022; the overlay recorded with regards to the uncertainty related to Russia/Ukraine in the second quarter of 2022 in the amount of € 83 million was released in the third quarter 2022

The Group applied the following overlays to the IFRS 9 model output as of December 31, 2021 until the end of December 31, 2022.

Construction Risk following increased prices for building materials

In 2021, the Group record a € 15 million overlay to address the risk of budget overruns due to unavailable or significantly more expensive building materials. The overlay was released in first quarter 2022 as the risk no longer existed and construction risk was factored into the lending criteria.

Model calibration (MEV outside the calibrated range)

The Group applied a management overlay to address the model uncertainty associated with extreme year on year MEV projections throughout the COVID-19 pandemic, in particular GDPs, which were identified as being outside the calibrated range of the FLI model. Since the model was not calibrated based on such extreme MEV movements, the Group was concerned that the model underestimated expected credit losses in such situations. As of December 31, 2021, the overlay was € 56 million and as the MEVs moved into the calibrated range in the first half of 2022, the overlay was fully released. The releases resulted in a decrease of the Group's allowance for credit losses.

Recalibrations required due to the new definition of default

In 2021, the Group implemented the new definition of default which is the trigger for Stage 3. The implementation of the new definition of default mainly affected the Private Bank, where the Stage 3 population in homogeneous portfolios increased. As the change in definition does not materially impact the total loss expectation of these portfolios, this change resulted in an overstatement of Stage 3 provisions as the related LGD parameters were not updated in the model. The next LGD recalibration has been rescheduled to the second half of 2023 as additional empirical data is needed for the statistical recalibration. The overlay will remain until the recalibration is completed. The estimate of the recalibration effect has been refined in the first quarter 2022 and was increased to € 92 million and remains the same as of December 31, 2022. The € 92 million overlay results in a decrease in the Group's allowance for credit losses but is offset by the overstatement of Stage 3 provisions calculated in the ECL model.

Uncertainty related to Russia/Ukraine

In the first quarter 2022, the Group introduced a management overlay amounting to € 44 million which was specific to the overall uncertainty associated with the economic outlook from the war in Ukraine and was released in second quarter 2022 once the uncertainty was included in the MEVs. However, towards the end of June 2022 the macro-economic outlook weakened further. The main reason was the growing concerns over the gas supply from Russia to Europe (Germany in particular) and market expectation of significantly more aggressive monetary tightening in the U.S. and other markets to combat persistent inflation. Both developments accelerated in late June and due to timing was not reflected in the consensus forecast. As a result, the bank recorded an overlay to increase the allowance for credit losses by € 83 million and was released in third quarter 2022 once reflected in the MEV forecasts.

During the third quarter of 2022, the Group carefully monitored the suspension of Russian gas to Germany via the Nord Stream 1 pipeline in early September and the attacks on Nord Stream 1 and Nord Stream 2 pipelines in late September. As uncertainty related to gas supplies was included in the consensus data as of September 30, 2022, no overlay was recorded in the third quarter.

As mentioned in the Forward-Looking Information section above, no overlays were deemed necessary as of December 31, 2022 for uncertainties related to the war in Ukraine, geopolitical events, rising interest rates or inflation as these uncertainties were reflected in the MEVs.

Model calibration (WTI oil price Index)

The Group introduced a management overlay to address model implications related to the incorporation of forward-looking information for oil prices in the ECL calculation. In the past, increases in oil prices were typically demand driven and reflective of a positive economic environment, which is why the IFRS 9 model was designed to release ECL provisions in this scenario. The increase in oil prices in first quarter 2022 was driven by supply risks and impacts from the war in Ukraine. Although higher oil prices have a positive effect on industries such as oil and gas producers, higher oil prices driven by supply issues have a negative impact on other industries and portfolios. Therefore a € 42 million overlay was recorded as of March 31, 2022 to reverse the release of provisions certain industries based on the increase in the WTI Oil price Index. The overlay was reduced to € 39 million for the period ended June 30, 2022, to € 27 million for the period ended September 30, 2022, and was fully released at the end of 2022. The overlay increased the Group's allowance for credit losses.

Overall assessment

In assessing whether the Group requires any additional overlays, it regularly reviews for evolving or emerging risks, especially in the current geopolitical environment. Similar to the measures included above in the Focus areas in 2022, these measures include client surveys and interviews, along with analysis of portfolios across businesses, regions and sectors. In addition, the Group regularly reviews and validates key model inputs and assumptions (including those in feeder models) and ensures where expert judgement is applied, it is in line with the Group's risk management framework. As of December 31, 2022, the Group did not identify any additional downside risks not reflected in the IFRS 9 ECL model and did not identify any model weaknesses that would require an additional overlay other than the existing overlay related to the new definition of default.

Model Sensitivity

The Group has identified three key model assumptions included in the IFRS 9 model. These include forward looking macroeconomic variables, the quantitative criteria for determining if a borrower has incurred a significant increase in credit risk and transferred to Stage 2, and the LGD setting on homogenous portfolios in Stage 3. Below the bank provides sensitivity analysis on the potential impact if these key assumptions applied in the ECL model were to deviate from the bank's base case expectations.

Macroeconomic Variables

The sensitivity of the ECL model with respect to potential changes in projections for key MEVs is shown in the tables below, which provides ECL impacts for Stages 1 and 2 from one sigma downward and upward shifts applied separately to each group of MEV as of December 31, 2022 and December 31, 2021. A sigma shift is a standard deviation used in statistics and probability calculations and is a measure of the dispersion of the values of a random variable. Each of these groups consists of MEVs from the same category:

- GDP growth rates: includes USA, Eurozone, Germany, Italy, Developing Asia, Emerging Markets
- Unemployment rates: includes USA, Eurozone, Germany, Italy, Japan, Spain
- Equities: S&P500, Nikkei, MSCI Asia
- Credit spreads: ITX Europe 125, High Yield Index, CDX IG, CDX High Yield, CDX Emerging Markets
- Real Estate: Commercial Real Estate Price Index
- Commodities: WTI oil price, Gold price

Although interest rates and inflation are not separately included in the MEVs above, the economic impact of these risks is adequately reflected in other macroeconomic variables, such as GDP growth rates, unemployment, equities and credit spreads as higher rates and inflation would filter through these forecasts and be included in the ECL model and sensitivity analysis below.

In addition, the sensitivity analysis only includes the impact of the aggregated MEV group (i.e. potential correlation between different MEV groups or the impact of management overlays is not taken into consideration). ECLs for Stage 3 are not affected and not reflected in the following tables as its calculation is independent of the macroeconomic scenarios.

Sensitivity impact is significantly higher as of December 31, 2022 compared to December 31, 2021, due to the overall higher level of ECL on which basis the sensitivity analysis was performed, taking into account the continued economic uncertainty from the effects of the war in Ukraine, geopolitical environment, rising interest rates and inflation as of December 31, 2022.

IFRS 9 – Sensitivities of Forward-Looking Information applied on Stage 1 and Stage 2 – Group Level

	December 31, 2022			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(83.3)	(1)pp	101.4
Unemployment rates	(0.5)pp	(40.8)	0.5pp	58.0
Real estate prices	5%	(5.6)	(5)%	6.0
Equities	10%	(15.8)	(10)%	19.6
Credit spreads	(40)%	(37.9)	40%	42.6
Commodities ¹	10%	(14.8)	(10)%	15.6

¹ Here the sign of the shift applies to oil prices changes. Gold price changes have the opposite sign. 1pp (percentage point), e.g. GDP shifts from 3% to 4% // 1% (percentage change), e.g. Real estate price shifts from 100 to 101.

	December 31, 2021			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(49.4)	(1)pp	55.5
Unemployment rates	(0.5)pp	(23.8)	0.5pp	25.4
Real estate prices	5%	(3.9)	(5)%	4.2
Equities	10%	(7.2)	(10)%	9.4
Credit spreads	(40)%	(20.9)	40%	23.5
Commodities	10%	(15.0)	(10)%	16.2

In the second and third quarter of 2022, the Group conducted a variety of scenarios to assess the downside impact should the cessation of Russia gas supplies to Europe lead to a sharper than expected economic slowdown and the emergence of more widespread defaults across European corporate and household exposures. Based on such factors, the Group estimated that such an event would potentially result in an additional allowance for credit losses of up to approximately bps 20 basis points over an 18-month period. As of yearend 2022, the Group acknowledged that the aforementioned scenario did not materialize and is no longer deemed plausible. Germany's gas storage was sufficiently filled to supply businesses and households over the winter, energy prices significantly declined, and alternate energy sources were identified.

The Group considered whether there were any other specific downside scenarios it should consider in its sensitivity analysis, but as the uncertainty related to interest rates and inflation is already included in the MEVs and the bank did not observe any specific vulnerable credit risk concentrations in its portfolios, the Group believes the one standard sigma shift provides the best information on the model's ECL sensitivity.

At the divisional level, the sensitivity analysis below was performed for the year ended December 31, 2022 and 2021, respectively, and revealed GDP growth rates, credit spreads and commodities prices to be the dominant factors for the Investment Bank, whereas the model sensitivity for the Corporate Bank and Private Bank is mainly associated with changes in GDP growth rates and unemployment rates. The model sensitivity table for the Private Bank shows GDP growth rates and unemployment rates only, as the key MEVs relevant to the underlying portfolios.

IFRS 9 – Sensitivities of Forward-Looking Information applied on Stage 1 and Stage 2 - Corporate Bank

	December 31, 2022			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(21.7)	(1)pp	24.6
Unemployment rates	(0.5)pp	(12.2)	0.5pp	14.0
Real estate prices	5%	(1.1)	(5)%	1.1
Credit spreads	(40)%	(7.5)	40%	9.1
Commodities ¹	10%	(4.3)	(10)%	4.6

¹ Here the sign of the shift applies to oil prices changes. Gold price changes have the opposite sign.

	December 31, 2021			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(12.5)	(1)pp	13.7
Unemployment rates	(0.5)pp	(8.9)	0.5pp	9.6
Real estate prices	5%	(0.5)	(5)%	0.5
Credit spreads	(40)%	(4.3)	40%	4.9
Commodities	10%	(4.5)	(10)%	5.0

IFRS 9 – Sensitivities of Forward-Looking Information applied on Stage 1 and Stage 2 - Investment Bank

	December 31, 2022			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(35.3)	(1)pp	36.9
Unemployment rates	(0.5)pp	(5.3)	0.5pp	6.1
Real estate prices	5%	(4.5)	(5)%	4.8
Equities	10%	(5.8)	(10)%	7.3
Credit spreads	(40)%	(26.3)	40%	28.5
Commodities ¹	10%	(9.8)	(10)%	10.3

¹ Here the sign of the shift applies to oil prices changes. Gold price changes have the opposite sign.

	December 31, 2021			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(24.5)	(1)pp	27.7
Unemployment rates	(0.5)pp	(3.7)	0.5pp	4.2
Real estate prices	5%	(3.4)	(5)%	3.6
Equities	10%	(2.4)	(10)%	3.1
Credit spreads	(40)%	(14.4)	40%	15.8
Commodities	10%	(10.1)	(10)%	10.8

IFRS 9 – Sensitivities of Forward-Looking Information applied on Stage 1 and Stage 2 - Private Bank

	December 31, 2022			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(21.8)	(1)pp	34.5
Unemployment rates	(0.5)pp	(20.7)	0.5pp	34.9

	December 31, 2021			
	Upward sensitivity		Downward sensitivity	
	Upward shift	ECL impact in € m.	Downward shift	ECL impact in € m.
GDP growth rates	1pp	(10.0)	(1)pp	10.7
Unemployment rates	(0.5)pp	(9.7)	0.5pp	9.8

Impact of Lifetime Expected Credit Losses for Stage 1 borrowers

As described earlier, the Group uses a mixture of quantitative and qualitative criteria to determine significant increase in credit risk which require, for affected borrowers, a move to lifetime ECL (Stage 2). If for all Stage 1 borrowers Deutsche Bank were to record lifetime expected credit losses, the Group's allowance for credit losses amounting to € 5.6 billion as of December 31, 2022 and € 5.4 billion as of December 31, 2021 would increase by approximately 44 % as of yearend 2022 and as of yearend 2021.

Stage 3 LGD setting

The Group's allowance for credit losses in Stage 3 for the homogeneous portfolios amounts to € 1.9 billion as of December 31, 2022 and € 2.2 billion as of December 31, 2021. The key driver in determining the ECL provision is the loss given default estimate, which differs by individual portfolios. Loss given default is influenced by recovery rates, proceeds from the sale of collateral, and cure rates. Some of the drivers for different portfolios include elements of expert judgment and in particular on expected cure rates. If the LGD for all homogeneous portfolios were to increase by 1%, then Stage 3 ECL would increase as of December 31, 2022 by approximately € 19 million (thereof € 11 million in Germany, € 5 million in Italy and € 2 million in Spain), and by approximately € 22 million as of December 31, 2021 (thereof € 11 million in Germany, € 7 million in Italy and € 2 million in Spain).

IFRS 9 Model results

In 2022, provision for credit losses was € 1.2 billion which is significantly higher than the € 515 million recorded for the year ended 2021. The increase is reflecting a deterioration of the macroeconomic environment following the war in Ukraine and increased number of impairment events compared to an overall more benign environment in 2021. The total provisions in 2022 includes € 114 million related to clients in Russia and Ukraine compared to € 10 million in 2021.

In 2022, € 204 million provision for credit losses were related to Stage 1 and 2 and € 1.0 billion to Stage 3, this compares to € 218 million release of Stage 1 and 2 provisions and an € 734 million in stage 3 in 2021. The increase of Stage 1 and 2 provisions was primarily driven by the deterioration of macroeconomic parameters, the increase of Stage 3 provisions was affecting all regions and sectors.

In regards to the Business Divisions, the Corporate Bank recorded an increase of provisions for credit losses of € 335 million in 2022 versus a € 3 million release in 2021. The year-over-year increase was primarily driven by Stage 1 and 2 provisions following a deteriorated macro-economic outlook, an increased number of impairments compared to a very benign development of provisions in the prior year. The Investment Bank recorded an increase of provisions for credit losses of € 319 million in 2022 versus € 104 million in 2021. The increase was mainly driven by an increased number of new impairments, whilst the prior year benefitted from a low number of impairment events which were further mitigated by larger Stage 3 releases. The Private Bank recorded an increase of provisions for credit losses of € 583 million in 2022 versus € 446 million reported in 2021. The increase was mainly driven by Stage 1 and 2 provisions following a deteriorated macro-economic outlook whilst previous year's period was benefitting from an overall benign macroeconomic environment.

The amounts recognized in the allowance for credit losses in relation to climate-related risks are deemed to be immaterial at the end of December 31, 2021 and as of December 31, 2022.

For details on the Group's accounting policy related to IFRS 9 Impairment, please refer to Note 1 - Significant Accounting Policies and Critical Accounting Estimates of the Consolidated Financial Statements.

Exposure to Russia

One of management's key focus areas in 2022 was the identification, assessment and management of direct and indirect impacts of the war in Ukraine. Since 2014, the Group has significantly reduced its footprint in Russia due to the heightened risk of sanctions and potential countermeasures. The bank has continued to reduce its risk positions through 2022 as a result of active exposure management, client repayments and roll-offs from guarantees.

As of December 31, 2022, the Group's loan exposure to Russia amounted to € 806 million on a gross basis (€ 1,397 million as of December 31, 2021), which represents approximately 0.2 % of the total loan book (0.3 % as of December 31, 2021). On a net basis, after risk mitigants such as Export Credit Agency insurance and Private Risk Insurance, the loan exposure amounted to € 379 million (€ 594 million as of December 31, 2021). Additional undrawn commitments amounted to € 78 million (€ 961 million as of December 31, 2021) and are subject to contractual drawdown protection and parental guarantees for multinational corporates ("MNCs"). The majority of loan exposure relates to large Russian companies with material operations and cash-flow outside of Russia. Such existing loans may be provided onshore by DB Moscow, or offshore by other Group entities outside of Russia. Wealth Management has granted offshore loans to counterparties with a Russian nexus, collateralized in line with the Group's policies. In line with the overall group strategy, exposures to Russian nexus clients have been reduced significantly during the course of 2022.

As of December 31, 2022, the Group had € 76 million contingent exposure to Russia via written financial and trade guarantees (€ 541 million as of December 31, 2021). Residual derivative exposures to Russia are small as all major positions have been unwound with the Group being a net payer on a mark-to-market basis.

The bank's overall net loan exposure to Ukraine is € 64 million as of December 31, 2022 (€ 42 million as of December 31, 2021).

Some of the aforementioned factors have resulted in immediate portfolio impacts in 2022, including negative rating migration on Russian names, resulting in higher credit risk weighted assets, as well as moderate increases in provisions for credit losses and higher impacts from prudential valuation. More broadly, in instances where there is a concern that counterparty credit quality has deteriorated or appears likely to deteriorate, the respective exposure has been placed on the "watchlist" and included in Stage 2. The objective of this early warning system is to address potential problems while adequate options for action are still available. As of December 31, 2022, beyond Russian names which have been added to the watchlist, the Group has not observed any material structural credit deterioration across other portfolios or industries related to Russia.

The following table provides an overview of total Russian exposures, including overnight deposits with the Central Bank of Russia in the amount of € 0.8 billion as of December 31, 2022 (€ 0.5 billion as of December 31, 2021) and other receivables,

which are subject to IFRS 9 impairment, and correspondent allowance for credit losses by stages as of December 31, 2022 and December 31, 2021.

Breakdown of total exposure and allowance for credit losses by stages

in € m.	Dec 31, 2022			Dec 31, 2021		
	Total Exposure	Allowance for Credit Losses ¹	Total collateral and guarantees	Total Exposure	Allowance for Credit Losses ¹	Total collateral and guarantees
Stage 1	209	0	59	3,198	1	648
Stage 2	1,182	10	375	332	2	263
Stage 3	336	68	152	3	0	2
Total	1,726	79	586	3,534	3	913

¹ Allowance for credit losses do not include allowance for country risk amounting to € 11 million as of December 31, 2022 and € 0 million as of December 31, 2021

Total exposure of € 1.7 billion consists of above mentioned € 0.8 billion loan exposure to Russia, € 78 million of undrawn commitments and € 0.8 billion of unsecured overnight deposits in Rubles with the Central Bank of Russia (which continues to be reflected in Stage 2 as of December 31, 2022); the residual unsecured exposure, excluding the unsecured overnight deposits in Rubles with the Central Bank of Russia, is mainly driven by undrawn commitments which are subject to ECA coverage and contractual drawdown protection.

Market Risk

The Group has managed its market risk to Russia by performing regular risk assessments of its risk profile. To mitigate a broader contagion risk, action was taken in second quarter of 2022 to reduce direct exposure prior to and immediately after events unfolded. This was achieved by entering into additional hedges and selective de-risking. The Group continues to closely monitor the situation by performing further contagion stress testing on different scenarios. On September 12, 2022 Russia CDS auction was completed and the recovery rate was set at 56 % with the settlement process completed on September 23, 2022. As of December 31, 2022, Deutsche Bank continues to maintain overall low levels of direct market risk exposure to Russia.

Russian operations

The Group has an operating subsidiary in Russia, OOO "Deutsche Bank" (DB Moscow), which provides corporate banking services to local subsidiaries of international companies. As of December 31, 2022, the Group's total capital position in Russia was € 0.3 billion (€ 0.2 billion as of December 31, 2021) and ~40 % of this capital was hedged against FX risk (~ 80 % as of December 31, 2021). Total assets of DB Moscow amounted to € 1.1 billion (€ 1.5 billion as of December 31, 2021), of which approximately € 0.8 billion (Russian Ruble equivalent, € 0.5 billion as of December 31, 2021) was deposited with the Central Bank of Russia. Local operations are fully self-funded with no cross-border Group funding required.

The Group also operates a technology service centre in Russia, OOO Deutsche Bank TechCentre (DBTC), which is one of several technology centers around the world. DBTC is focused on delivering "change-the-bank" activities for the Investment Bank and the Corporate Bank. The Group continues to de-risk its operations in DBTC by reassigning tasks to other technology centers around the world. The Group have stress-tested the ability of the bank's other technology centers around the world, including in Asia, to cover the Russian service center's development capabilities. There is no data or code maintained in the Russian Tech-Centre.

In 2022, the Group established its next Technology Centre in Berlin, Germany. The center will primarily support the ambitions of the Investment Bank and the Corporate Bank through application development and the integration of new technologies. While the Group will continue to grow the Berlin Technology Centre with local hires, there have also been transfers of resources from its Tech Centre in Russia to Berlin as it consolidates the hub for Artificial Intelligence and Machine Learning expertise, which represents a key opportunity for the Group to create significant value for its clients and further enhance the efficient running of its operations.

The Group has accrued for the committed relocation costs of certain resources from DBTC.

Compliance and Anti Financial Crime risks

The Group continues to rapidly adapt to the sanctions landscape that has and continues to evolve after the invasion of Ukraine. After the implementation of sanctions, the Bank has reacted with several actions including but not limited to prompt updates of the Bank's relevant lists for Name List Screening and Transaction Filtering, the formulation and dissemination of guidance to the businesses, engagement with governmental bodies on interpretive issues and the seeking of special licenses to allow for orderly wind-downs of open positions. The AFC function, and specifically its Sanctions & Embargoes department, plays a crucial role in the current situation given the rapidly changing regulatory environment and provides, where needed, up-to-date guidance to the businesses.

IFRS 9 - Application of EBA guidance regarding Default, Forbearance and IFRS 9 in light of COVID-19 measures

EBA's "Statement on the application of the prudential framework regarding Default, Forbearance and IFRS 9 in light of COVID-19 measures" published on March 25, 2020 states that institutions are expected to use a degree of judgement and distinguish between borrowers whose credit standing would not be significantly affected by the current situation in the long term, and those who would be unlikely to restore their creditworthiness. The Bank performed portfolio reviews and applied this regulatory guidance to a number of clients mainly in the Investment Bank and Corporate Bank.

EBA is further of the view that the public and private moratoria, as a response to COVID-19 pandemic, do not have to be automatically classified as forbearance if the moratoria are not borrower specific, based on the applicable national law or on an industry or sector-wide private initiative agreed and applied broadly by relevant credit institutions. Deutsche Bank has introduced this guidance into its internal risk management processes.

Legislative and non-legislative moratoria and public guarantee schemes in light of COVID-19 pandemic

In 2020, the European Banking Association (EBA) issued a "Statement on the application of the prudential framework regarding Default, Forbearance and IFRS 9 in light of COVID-19 measures", along with guidance on legislative and non-legislative moratoria.

The following table provides an overview of expired loans and advances subject to EBA-compliant moratoria, loans and advances subject to COVID-19 related forbearance measures and newly originated loans and advances subject to a public guarantee scheme as of December 31, 2022 and December 31, 2021. There have been no newly originated loans and advances subject COVID-19 related forbearance measures and public guarantee scheme since December 31, 2021.

Breakdown of COVID-19 related measures by stages

Dec 31, 2022						
in € m.	Legislative and non-legislative Moratoria		COVID-19 related forbearance measures		Public guarantee schemes	
	Gross Carrying Amount	Expected Credit Losses	Gross Carrying Amount	Expected Credit Losses	Gross Carrying Amount	Expected Credit Losses
Stage 1	4,377	(6)	1,835	(2)	2,159	(3)
Stage 2	1,060	(22)	1,027	(16)	816	(9)
Stage 3	541	(152)	337	(77)	190	(37)
Total	5,978	(180)	3,199	(95)	3,165	(49)

Dec 31, 2021						
in € m.	Legislative and non-legislative Moratoria		COVID-19 related forbearance measures		Public guarantee schemes	
	Gross Carrying Amount	Expected Credit Losses	Gross Carrying Amount	Expected Credit Losses	Gross Carrying Amount	Expected Credit Losses
Stage 1	5,381	(10)	3,330	(6)	3,079	(2)
Stage 2	1,288	(30)	2,602	(31)	770	(9)
Stage 3	698	(162)	965	(122)	103	(14)
Total	7,368	(202)	6,897	(158)	3,952	(25)

COVID-19 related forbearance measures: As of December 31, 2022, COVID-19 forbearance measures have been granted to € 3.2 billion outstanding loans and advances. As of December 31, 2022, over 88 % of clients are still performing and the Bank continues to remain at a stable ECL level. All forborne loans and advances are required to be classified as forborne until a 24-months' probation period has been reached.

EBA-compliant moratoria can be divided into legislative moratoria, which are instituted by the Government and non-legislative moratoria granted by a group of financial institutions.

Moratoria were mainly granted in Germany, Italy and Spain and expired by year end 2020 resp. 2021. More than 95 % of these clients who took advantage of moratoria have resumed their payments. As of December 31, 2021, less than € 30 million were still active. During 2022, the number of clients and volumes under moratoria have further significantly reduced due to repayments. As of December 31, 2022, nearly all moratoria have expired, those that are still active are € 4.5 million.

Newly originated loans and advances subject to a public guarantee scheme: The Group has originated approximately € 3.4 billion of loans under the public guarantee scheme as of December 31, 2022. Approximately € 1.7 billion of loans were granted in Germany via programs sponsored by KfW, of which, € 0.2 billion were derecognized as the terms of the loan and guarantee met the criteria for derecognition under IFRS 9, and € 1.7 billion were originated in Spain. As of December 31, 2022, 94 % of the loans that were granted public guarantees continue to make regular repayments.

Asset Quality

The Asset Quality section under IFRS 9 describes the quality of debt instruments subject to impairment, which under IFRS 9 consist of debt instruments measured at amortized cost, financial instruments at fair value through other comprehensive income (FVOCI) as well as off balance sheet lending commitments such as loan commitments and financial guarantees (hereafter collectively referred to as "Financial Assets").

Overview of financial assets subject to impairment

The following tables provide an overview of the exposure amount and allowance for credit losses by financial asset class broken down into stages as per IFRS 9 requirements.

Overview of financial assets subject to impairment

	Dec 31, 2022					Dec 31, 2021				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Amortized cost¹										
Gross carrying amount	729,021	45,335	11,379	1,041	786,776	711,021	40,653	11,326	1,297	764,298
Allowance for credit losses ²	533	626	3,656	180	4,995	440	532	3,740	182	4,895
of which Loans										
Gross carrying amount	440,556	43,711	10,686	1,027	495,979	425,342	38,809	10,653	1,272	476,077
Allowance for credit losses ²	507	619	3,491	174	4,790	421	530	3,627	177	4,754
Fair value through OCI										
Fair value	31,123	482	70	0	31,675	28,609	326	44	0	28,979
Allowance for credit losses	14	12	43	0	69	15	10	16	0	41
Off-balance sheet										
Notional amount	296,062	18,478	2,625	8	317,173	276,157 ⁴	14,498	2,582	11	293,248 ⁴
Allowance for credit losses ³	144	97	310	0	551	108	111	225	0	443

¹ Financial assets at amortized cost consist of: loans at amortized cost, cash and central bank balances, interbank balances (w/o central banks), central bank funds sold and securities purchased under resale agreements, securities borrowed and certain subcategories of other assets.

² Allowance for credit losses do not include allowance for country risk amounting to € 14 million as of December 31, 2022 and € 4 million as of December 31, 2021.

³ Allowance for credit losses do not include allowance for country risk amounting to € 9 million as of December 31, 2022 and € 6 million as of December 31, 2021.

⁴ Prior year's comparatives aligned to presentation in the current year.

Country risk allowance

The Group records country risk allowances for transfer risks, where clients are unable to transfer funds cross border to service an obligation in another jurisdiction due to direct sovereign intervention (e.g. a debt moratorium or capital controls). To quantify the transfer risks the bank uses an expected loss calculation, whereby the PD reflects the country risk rating provided by Risk Research. As of the year end 2022, the Group recorded country risk allowance amounting to € 23 million for on- and off-balance sheet items, which is an increase of € 13 million versus the year end 2021 primarily driven by exposures to clients domiciled in Russia.

Financial assets at amortized cost

The following tables provide an overview of development of financial assets at amortized cost and related allowance for credit losses in each of the relevant reporting periods broken down into stages as per IFRS 9 requirements.

Development of exposures in the current reporting period

	Dec 31, 2022				
	Gross carrying amount				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	711,021	40,653	11,326	1,297	764,298
Movements in financial assets including new business and credit extensions	113,427	5,554	923	(1)	119,902
Transfers due to changes in creditworthiness	(2,101)	666	1,435	0	0
Changes due to modifications that did not result in derecognition	0	(0)	(6)	0	(6)
Changes in models	0	0	0	0	0
Financial assets that have been derecognized during the period	(103,660)	(2,177)	(2,583)	(258)	(108,679)
Recovery of written off amounts	0	0	68	3	71
Foreign exchange and other changes	10,334	639	216	0	11,189
Balance, end of reporting period	729,021	45,335	11,379	1,041	786,776

Financial assets at amortized cost subject to impairment increased by € 22 billion or 3 % in 2022, which was largely driven by stage 1:

Stage 1 exposures increased by € 18 billion or 3 % primarily due to the increases in loans at amortized cost in Investment Bank and Private Bank as well as in debt securities held to collect, which were partly offset by a reduction in central bank balances.

Stage 2 exposures increased by € 5 billion or 12 % largely driven by loans at amortized cost in Private Bank due to the deterioration of the macroeconomic environment.

Stage 3 exposures slightly decreased by € 203 million or 2 % in 2022, which was driven by reductions in Private Bank and the POCI loan portfolio. This was partly offset by the increase in Corporate Bank due to new defaults.

Development of exposures in the previous reporting period

	Dec 31, 2021				
	Gross carrying amount				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	651,637	35,372	10,655	1,729	699,393
Movements in financial assets including new business and credit extensions	79,619	7,507	305	(101)	87,330
Transfers due to changes in creditworthiness	(155)	(1,109)	1,264	0	0
Changes due to modifications that did not result in derecognition	(1)	(0)	(16)	0	(17)
Changes in models	0	0	0	0	0
Financial assets that have been derecognized during the period	(34,157)	(1,891)	(1,271)	(372)	(37,691)
Recovery of written off amounts	0	0	55	23	78
Foreign exchange and other changes	14,078	774	333	19	15,204
Balance, end of reporting period	711,021	40,653	11,326	1,297	764,298

Financial assets at amortized cost subject to impairment increased by € 64 billion or 9 % in 2021, which was largely driven by stage 1:

Stage 1 exposures increased by € 58 billion or 9 % primarily due to the increase in loans at amortized cost in Investment Bank and Private Bank as well as the increase in central bank balances.

Stage 2 exposures increased by € 5 billion or 15 % largely driven by the Investment Bank due to enhancements in the process related Stage 2 triggers, discussed in the IFRS 9 impairment section of the Annual Report 2021.

Stage 3 exposures slightly increased by € 240 million or 2 % in 2021, which was driven by the new defaults in the Private Bank as well as in the Investment Bank. This was partly offset by the reductions in our POCI loan portfolio as well as Corporate Bank and Capital Release Unit.

Development of allowance for credit losses in the current reporting period

	Dec 31, 2022				
	Allowance for Credit Losses ²				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI ⁴	Total
Balance, beginning of year	440	532	3,740	182	4,895
Movements in financial assets including new business and credit extensions	(32)	204	887	22	1,081
Transfers due to changes in creditworthiness	122	(121)	(0)	N/M	0
Changes due to modifications that did not result in derecognition	N/M	N/M	N/M	N/M	N/M
Changes in models	0 ⁰	0	0	0	0
Financial assets that have been derecognized during the period ³	0	0	(1,014)	(28)	(1,043)
Recovery of written off amounts	0	0	68	3	71
Foreign exchange and other changes	2	12	(25)	1	(10)
Balance, end of reporting period	533	626	3,656	180	4,995
Provision for Credit Losses excluding country risk ¹	90	82	886	22	1,081

¹ Movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models add up to Provision for Credit Losses excluding country risk.

² Allowance for credit losses does not include allowance for country risk amounting to € 14 million as of December 31, 2022.

³ This position includes charge offs of allowance for credit losses.

⁴ The total amount of undiscounted expected credit losses at initial recognition on financial assets that are purchased or originated credit-impaired initially recognized during the reporting period was € 46 million in 2022 and € 0 million in 2021.

Allowance for credit losses against financial assets at amortized cost subject to impairment increased by € 100 million or 2 % in 2022, which was driven by Stages 1 and 2:

Stage 1 allowances increased by € 93 million or 21 % driven by the deteriorating macroeconomic environment, as explained earlier.

Stage 2 allowances increased by € 94 million or 18 % due to the deterioration of macroeconomic outlook, as explained earlier.

Stage 3 allowances decreased by € 87 million or 2 % mainly driven by reductions due to non-performing portfolio sales in Private Bank, which were partly offset by the new bookings in Investment Bank and Corporate Bank.

The Group's Stage 3 coverage ratio (defined as allowance for credit losses in Stage 3 (excluding POCI) divided by financial assets at amortized cost in Stage 3 (excluding POCI)) amounted to 32 % in the current fiscal year, compared to 33 % in the prior year.

Due to the deteriorated macroeconomic environment, the net transfers in Stage 1 due to changes in creditworthiness slightly decreased in 2022 on a year-over-year basis. The net outflows from Stage 2 due to changes in creditworthiness reduced in the full year 2022 as well, which was mainly due to lower allowance levels in Stage 2 in the prior year, following the recovery from the COVID-19 pandemic.

In 2022, the net transfers in Stage 3 (excluding POCI) went down compared to 2021. The immaterial amount of net transfers due to creditworthiness in Stage 3 in 2022 resulted from the offset of the outflows from Stage 3 by the lower inflows. This was attributable to lower allowances in Stage 1 and Stage 2 in the prior year period, as discussed above.

Development of allowance for credit losses in the previous reporting period

	Dec 31, 2021				
	Allowance for Credit Losses ²				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI ⁴	Total
Balance, beginning of year	544	648	3,614	139	4,946
Movements in financial assets including new business and credit extensions	(245)	85	615	26	480
Transfers due to changes in creditworthiness	138	(197)	58	N/M	0
Changes due to modifications that did not result in derecognition	N/M	N/M	N/M	N/M	N/M
Changes in models	0	0	0	0	0
Financial assets that have been derecognized during the period ³	0	0	(561)	(5)	(566)
Recovery of written off amounts	0	0	55	23	78
Foreign exchange and other changes	3	(4)	(41)	(0)	(43)
Balance, end of reporting period	440	532	3,740	182	4,895
Provision for Credit Losses excluding country risk ¹	(107)	(112)	673	26	480

¹ Movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models add up to Provision for Credit Losses excluding country risk.

² Allowance for credit losses does not include allowance for country risk amounting to € 4 million as of December 31, 2021.

³ This position includes charge offs of allowance for credit losses.

⁴ The total amount of undiscounted expected credit losses at initial recognition on financial assets that are purchased or originated credit-impaired initially recognized during the reporting period was € 0 million in 2021 and € 46 million in 2020 (Prior year's comparatives aligned to presentation in the current year).

Allowance for credit losses against financial assets at amortized cost subject to impairment slightly decreased by € (51) million or (1) % in 2021 mainly driven by Stages 1 and 2:

Stage 1 allowances decreased by € 104 million or 19 % due to the update of macroeconomic outlook, as explained in the Annual Report 2021.

Stage 2 allowances decreased by € (117) million or (18) % driven by the update of macroeconomic outlook, as explained in the Annual Report 2021.

Stage 3 allowances increased by € 169 million or 5 % driven by new defaults in Private Bank and Investment Bank as well as the increase in allowance against the existing POCI loan portfolio, which were partly offset by the reductions in Corporate Bank and Capital Release Unit.

Financial assets at amortized cost by business division

	Dec 31, 2022									
	Gross Carrying Amount ¹					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Corporate Bank	114,983	11,030	2,879	0	128,892	91	99	963	0	1,153
Investment Bank	164,443	10,288	2,375	1,041	178,147	145	89	491	180	904
Private Bank	243,896	22,609	5,870	0	272,375	283	433	2,167	0	2,883
Asset Management	1,861	49	0	0	1,910	0	0	0	0	0
Capital Release Unit	1,769	115	115	0	2,000	1	2	34	0	36
Corporate & Other	202,069	1,244	140	0	203,453	13	4	1	0	18
Total	729,021	45,335	11,379	1,041	786,776	533	626	3,656	180	4,995

¹ Gross Carrying Amount numbers per business division are reported after a reallocation of cash balances from business divisions to Corporate & Other.

	Dec 31, 2021									
	Gross Carrying Amount ¹					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Corporate Bank	116,332	10,165	2,113	0	128,611	56	83	901	0	1,040
Investment Bank	147,177	9,783	2,487	1,264	160,711	106	78	356	182	723
Private Bank	235,067	19,526	6,496	33	261,122	269	365	2,383	0	3,018
Asset Management	2,218	58	0	0	2,276	1	1	0	0	2
Capital Release Unit	2,743	210	212	0	3,165	2	1	99	0	103
Corporate & Other	207,485	910	18	0	208,413	6	3	1	0	10
Total	711,021	40,653	11,326	1,297	764,298	440	532	3,740	182	4,895

¹ Gross Carrying Amount numbers per business division are reported after a reallocation of cash balances from business divisions to Corporate & Other.

Financial assets at amortized cost by industry sector

The below table gives an overview of the Group's asset quality by industry and is based on the NACE code of the counterparty. NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) is a standard European industry classification system.

	Dec 31, 2022									
	Gross Carrying Amount					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Agriculture, forestry and fishing	425	76	23	0	525	1	1	8	0	10
Mining and quarrying	2,227	137	70	0	2,434	4	5	23	0	32
Manufacturing	25,151	4,670	1,163	84	31,068	35	64	519	3	620
Electricity, gas, steam and air conditioning supply	6,226	563	51	0	6,839	4	5	33	0	42
Water supply, sewerage, waste management and remediation activities	624	63	39	0	726	1	1	6	0	8
Construction	3,453	540	203	87	4,282	5	9	91	10	115
Wholesale and retail trade, repair of motor vehicles and motorcycles	18,710	2,530	733	31	22,004	20	30	383	3	437
Transport and storage	5,233	642	225	28	6,127	9	8	65	(0)	83
Accommodation and food service activities	1,385	466	112	6	1,969	2	5	59	1	67
Information and communication	7,096	614	127	17	7,854	14	13	94	0	122
Financial and insurance activities	356,491	8,991	1,999	402	367,883	129	73	472	46	720
Real estate activities	41,450	6,345	896	238	48,929	30	22	116	71	239
Professional, scientific and technical activities	6,147	721	218	1	7,087	6	9	104	0	119
Administrative and support service activities	8,429	1,003	383	18	9,833	9	13	94	6	121
Public administration and defense, compulsory social security	30,984	418	923	0	32,325	15	0	17	0	33
Education	205	41	4	0	251	0	1	2	0	3
Human health services and social work activities	4,188	351	83	0	4,622	8	12	12	0	32
Arts, entertainment and recreation	922	185	28	1	1,137	1	5	2	0	9
Other service activities	7,198	818	226	123	8,365	10	6	133	25	174
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	202,435	16,160	3,874	6	222,475	229	343	1,423	15	2,010
Activities of extraterritorial organizations and bodies	41	0	0	0	41	0	0	0	0	0
Total	729,021	45,335	11,379	1,041	786,776	533	626	3,656	180	4,995

	Dec 31, 2021									
	Gross Carrying Amount					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Agriculture, forestry and fishing	544	73	29	0	646	1	1	11	0	12
Mining and quarrying	2,771	95	63	0	2,929	3	0	13	0	17
Manufacturing	31,776	3,466	957	97	36,296	24	36	481	3	543
Electricity, gas, steam and air conditioning supply	4,414	174	117	0	4,705	2	2	41	0	45
Water supply, sewerage, waste management and remediation activities	580	51	50	0	680	1	2	8	0	11
Construction	3,672	375	271	128	4,446	8	5	178	(1)	190
Wholesale and retail trade, repair of motor vehicles and motorcycles	19,582	1,355	747	32	21,717	18	19	397	3	436
Transport and storage	4,513	862	378	29	5,782	12	12	72	(0)	96
Accommodation and food service activities	1,356	769	122	18	2,265	1	9	62	(2)	70
Information and communication	6,431	257	157	16	6,860	10	4	98	0	112
Financial and insurance activities	359,874	6,711	1,756	491	368,832	94	48	245 ¹	54	442
Real estate activities	34,827	5,339	1,115	271	41,551	16	22	97	55	190
Professional, scientific and technical activities	6,017	751	225	34	7,027	6	9	107	0	122
Administrative and support service activities	9,477	1,767	467	24	11,736	11	21	132	4	167
Public administration and defense, compulsory social security	18,174	2,073	49	0	20,295	5	11	5	0	21
Education	190	34	5	0	228	0	1	2	0	3
Human health services and social work activities	3,620	331	105	0	4,056	4	6	18	0	28
Arts, entertainment and recreation	690	371	11	1	1,073	2	3	3	1	8
Other service activities	8,564	920	225	140	9,850	6	12	116 ¹	49	183
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	193,909	14,880	4,477	16	213,282	218	309	1,653	16	2,196
Activities of extraterritorial organizations and bodies	40	0	1	0	41	0	0	1	0	1
Total	711,021	40,653	11,326	1,297	764,298	440	532	3,740	182	4,895

¹ Prior year's comparatives aligned to presentation in the current year.

Financial assets at amortized cost by region

	Dec 31, 2022									
	Gross Carrying Amount					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Germany	324,716	19,904	3,689	0	348,310	201	333	1,619	13	2,166
Western Europe (excluding Germany)	141,935	9,828	3,171	712	155,646	178	194	1,224	162	1,758
Eastern Europe	8,050	1,174	386	0	9,609	3	7	97	0	107
North America	173,084	10,504	1,628	149	185,366	81	55	289	5	431
Central and South America	4,525	253	82	5	4,865	6	2	5	0	12
Asia/Pacific	58,621	2,967	1,475	112	63,174	40	28	330	3	400
Africa	3,144	177	843	0	4,164	8	0	7	0	15
Other	14,946	527	105	63	15,642	16	6	86	(4)	105
Total	729,021	45,335	11,379	1,041	786,776	533	626	3,656	180	4,995

	Dec 31, 2021									
	Gross Carrying Amount					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Germany	317,217	17,941	3,581	33	338,773	191	298	1,653	14	2,156
Western Europe (excluding Germany)	134,187	9,224	3,652	937	148,000	134	156	1,533 ¹	150	1,973
Eastern Europe	6,818	494	99	0	7,412	2	4	53	0	59
North America	174,574	8,853	2,131	145	185,703	53	55	180	16	304
Central and South America	3,908	206	197	7	4,318	3	0	13	2	18
Asia/Pacific	58,984	2,351	1,518	137	62,990	45	8	227	2	282
Africa	2,081	1,319	39	0	3,439	3	11	1	0	16
Other	13,252	263	110	38	13,664	10	0	79 ¹	(2)	88
Total	711,021	40,653	11,326	1,297	764,298	440	532	3,740	182	4,895

¹ Prior year's comparatives aligned to presentation in the current year.

Financial assets at amortized cost by rating class

	Dec 31, 2022									
	Gross Carrying Amount					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
iAAA–iAA	251,598	228	0	0	251,826	3	0	0	0	3
iA	106,548	580	0	14	107,142	9	1	0	0	10
iBBB	172,643	6,246	0	0	178,889	63	21	0	0	84
iBB	159,538	14,891	0	0	174,429	212	91	0	0	302
iB	35,626	17,717	0	14	53,358	218	276	0	6	501
iCCC and below	3,068	5,672	11,379	1,013	21,132	28	237	3,656	174	4,095
Total	729,021	45,335	11,379	1,041	786,776	533	626	3,656	180	4,995

	Dec 31, 2021									
	Gross Carrying Amount					Allowance for Credit Losses				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
iAAA–iAA	257,805	471	0	0	258,276	2	0	0	0	2
iA	99,418	1,325	0	9	100,753	6	1	0	0	7
iBBB	163,434	3,938	0	0	167,371	39	12	0	0	51
iBB	152,040	11,898	0	0	163,938	150	71	0	0	221
iB	33,572	17,942	0	16	51,530	205	253	0	6	463
iCCC and below	4,752	5,079	11,326	1,272	22,430	39	195	3,740	177	4,151
Total	711,021	40,653	11,326	1,297	764,298	440	532	3,740	182	4,895

The Group's existing commitments to lend additional funds to debtors with Stage 3 financial assets at amortized cost amounted to € 621 million as of December 31, 2022 and € 384 million as of December 31, 2021.

Collateral held against financial assets at amortized cost in Stage 3

	Dec 31, 2022			Dec 31, 2021		
in € m.	Gross Carrying Amount	Collateral	Guarantees	Gross Carrying Amount	Collateral	Guarantees
Financial Assets at Amortized Cost (Stage 3)¹	11,379	3,431	1,439	11,326	4,140	496

¹ Stage 3 consists here only of non-POCI assets.

In 2022, collateral and guarantees held against financial assets at amortized cost in Stage 3 increased by € 234 million, or 5 % mainly driven by Investment Bank as well as by Private Bank.

Due to full collateralization the Group did not recognize an allowance for credit losses against financial assets at amortized cost in Stage 3 for € 916 million in 2022 and € 1,130 million in 2021.

Modified Assets at Amortized Cost

A financial asset is considered modified when its contractual cash flows are renegotiated or otherwise modified. Renegotiation or modification may or may not lead to derecognition of the old and recognition of the new financial instrument. This section covers modified financial assets that have not been derecognized.

Under IFRS 9, when the terms of a Financial Asset are renegotiated or modified and the modification does not result in derecognition, a gain or loss is recognized in the income statement as the difference between the original contractual cash flows and the modified cash flows discounted at the original effective interest rate (EIR). For modified financial assets the determination of whether the asset's credit risk has increased significantly reflects the comparison of:

- The remaining lifetime probability of default (PD) at the reporting date based on the modified terms; with
- The remaining lifetime PD estimated based on data at initial recognition and based on the original contractual terms.

The following table provides the overview of modified financial assets at amortized cost in the reporting periods broken down into IFRS 9 stages.

Modified Assets at Amortized Cost

	Dec 31, 2022					Dec 31, 2021				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Amortized cost carrying amount prior to modification	0	0	47	0	47	0	22	17	0	40
Net modification gain/losses recognized	0	(0)	(6)	0	(6)	(1)	0	(16)	0	(16)

In 2022, the bank has observed the increase of € 7 million or 17 % in modified assets at amortized cost due credit related modifications. The Group did not include any COVID-19 driven modifications into the above table. For further details related to COVID-19 driven modifications, please refer to “Legislative and non-legislative moratoria and public guarantee schemes in light of COVID-19 pandemic”

In 2022, the Group has not observed any amounts of modified assets that have been upgraded to Stage 1. The bank has not observed any subsequent re-deterioration of those assets into Stages 2 and 3.

In 2021, the Group has observed immaterial amounts of modified assets that have been upgraded to Stage 1. The bank has not observed any subsequent re-deterioration of those assets into Stages 2 and 3.

Financial Assets at Fair value through Other Comprehensive Income

The fair value of financial assets at Fair value through Other Comprehensive Income (FVOCI) subject to impairment was € 32 billion at December 31, 2022, compared to € 29 billion at December 31, 2021. Allowance for credit losses against these assets remained at very low levels (€ 69 million as of December 31, 2022 and € 41 million as of December 31, 2021). Due to immateriality no further breakdown is provided for financial assets at FVOCI.

Off-balance sheet lending commitments and guarantee business

The following tables provide an overview of the nominal amount and credit loss allowance for the Group's off-balance sheet financial asset class broken down into stages as per IFRS 9 requirements.

Development of nominal amount in the current reporting period

	Dec 31, 2022				
	Nominal Amount				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	276,157	14,498	2,582	11	293,248
Movements including new business	16,078	361	62	(3)	16,498
Transfers due to changes in creditworthiness	(3,047)	3,166	(119)	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	6,874	452	100	(0)	7,427
Balance, end of reporting period	296,062	18,478	2,625	8	317,173
of which: Financial guarantees	61,083	5,283	971	0	67,337

Development of nominal amount in the previous reporting period

	Dec 31, 2021				
	Nominal Amount				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	251,795 ¹	8,723	2,587	1	263,106 ¹
Movements including new business	18,247	3,236	(273)	10	21,220
Transfers due to changes in creditworthiness	(2,177)	2,019	158	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	8,292	521	110	0	8,923
Balance, end of reporting period	276,157 ¹	14,498	2,582	11	293,248 ¹
of which: Financial guarantees	55,477	2,975	1,036	0	59,488

¹ Prior year's comparatives aligned to presentation in the current year.

Development of allowance for credit losses in the current reporting period

	Dec 31, 2022				
	Allowance for Credit Losses ²				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	108	111	225	0	443
Movements including new business	21	(1)	78	0	99
Transfers due to changes in creditworthiness	12	(15)	3	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	4	3	3	0	9
Balance, end of reporting period	144	97	310	0	551
of which: Financial guarantees	95	56	226	0	378
Provision for Credit Losses excluding country risk ¹	33	(16)	82	0	99

¹ The above table breaks down the impact on provision for credit losses from movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models.

² Allowance for credit losses does not include allowance for country risk amounting to € 9 million as of December 31, 2022.

Development of allowance for credit losses in the previous reporting period

	Dec 31, 2021				
	Allowance for Credit Losses ²				
in € m.	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	144	74	200	0	419
Movements including new business	(43)	38	18	0	13
Transfers due to changes in creditworthiness	3	(5)	2	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	3	3	6	0	12
Balance, end of reporting period	108	111	225	0	443
of which: Financial guarantees	69	64	164	0	297
Provision for Credit Losses excluding country risk ¹	(40)	33	19	0	13

¹ The above table breaks down the impact on provision for credit losses from movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models.

² Allowance for credit losses does not include allowance for country risk amounting to € 6 million as of December 31, 2021.

Legal Claims

Assets subject to enforcement activity consist of assets, which have been fully or partially written off and the Group still continues to pursue recovery of the asset. Such enforcement activity comprises for example cases where the bank continues to devote resources (e.g. our Legal Department/CRM workout unit) towards recovery, either via legal channels or third party recovery agents. Enforcement activity also applies to cases where the Bank maintains outstanding and unsettled legal claims. This is irrespective of whether amounts are expected to be recovered and the recovery timeframe. It may be common practice in certain jurisdictions for recovery cases to span several years.

Amounts outstanding on financial assets that were written off during the reporting period and are still subject to enforcement activity amounted to € 175 million in fiscal year 2022, mainly in Corporate Bank as well as in Private Bank. In 2021, legal claims amounted to € 234 million, mainly in Corporate Bank, Investment Bank and Private Bank.

Renegotiated and forborne assets at amortized costs

For economic or legal reasons the bank might enter into a forbearance agreement with a borrower who faces or will face financial difficulties in order to ease the contractual obligation for a limited period of time. A case-by-case approach is applied for corporate clients considering each transaction and client-specific facts and circumstances. For consumer loans the bank offers forbearances for a limited period of time, in which the total or partial outstanding or future instalments are deferred to a later point of time. However, the amount not paid including accrued interest during this period must be re-compensated at a later point of time. Repayment options include distribution over residual tenor, a one-off payment or a tenor extension. Forbearances are restricted and depending on the economic situation of the client, the Group's risk management strategies and the local legislation. In case a forbearance agreement is entered into, an impairment measurement is conducted as described below, an impairment charge is taken if necessary and the loan is subsequently recorded as impaired.

In the Group's management and reporting of forborne assets at amortized costs, the bank follows the EBA definition for forbearances and non-performing loans (Implementing Technical Standards (ITS) on Supervisory reporting on forbearance and non-performing exposures under article 99(4) of Regulation (EU) No 575/2013). Once the conditions mentioned in the ITS are met, the Group reports the loan as being forborne; removes the asset from the bank's forbearance reporting, once the discontinuance criteria in the ITS are met (i.e., the contract is considered as performing, a minimum two year probation period has passed, regular payments of more than an insignificant aggregate amount of principal or interest have been made during at least half of the probation period, and none of the exposures to the debtor is more than 30 days past-due at the end of the probation period).

In 2020, forbearance measures granted as a consequence of the COVID-19 pandemic have been added to the above regulations and are included in the following table, even if these measures, in accordance with EBA guidance, do in general not trigger a stage transition. COVID-19 related moratoria in contrast are not relevant for the below table. For further details please refer to the section "Legislative and non-legislative moratoria and public guarantee schemes in light of COVID-19 pandemic".

Forborne financial assets at amortized cost

in € m.	Dec 31, 2022						Dec 31, 2021					
	Performing		Non-performing			Total forborne loans at amortized cost	Performing		Non-performing			Total forborne loans at amortized cost
	Stage 1	Stage 2	Stage 1	Stage 2	Stage 3		Stage 1	Stage 2	Stage 1	Stage 2	Stage 3	
German	729	1,563	0	21	1,066	3,379	690	1,903	0	17	1,056	3,665
Non-German	1,254	3,139	60	13	3,299	7,764	2,478	3,489	135	25	3,949	10,076
Total	1,983	4,702	60	34	4,365	11,143	3,168	5,391	135	42	5,004	13,741

Development of forborne financial assets at amortized cost

in € m.	Dec 31, 2022	Dec 31, 2021
Balance beginning of period	13,741	13,459
Classified as forborne during the year	3,196	4,945
Transferred to non-forborne during the year (including repayments)	(5,899)	(4,934)
Charge-offs	(142)	(43)
Exchange rate and other movements	248	313
Balance end of period	11,143	13,741

Forborne assets at amortized cost decreased by € 2.6 billion, or 19 % in 2022. This was driven by the reduction in the COVID-19 related forbearance measures, which was partly offset by the increase in Investment Bank and Corporate Bank.

Forborne assets at amortized cost slightly increased by € 282 million, or 2 % in 2021.

Collateral Obtained

The Group obtains collateral on the balance sheet only in certain cases by either taking possession of collateral held as security or by calling upon other credit enhancements. Collateral obtained is made available for sale in an orderly fashion or through public auctions, with the proceeds used to repay or reduce outstanding indebtedness. Generally, the bank does not occupy obtained properties for its business use.

Collateral Obtained during the reporting period

in € m.	2022	2021
Commercial real estate	2	0
Residential real estate ¹	1	2
Other	0	0
Total collateral obtained during the reporting period	4	2

¹ Carrying amount of foreclosed residential real estate properties amounted to € 62 million as of December 31, 2022 and € 67 million as of December 31, 2021.

The collateral obtained, as shown in the table above, excludes collateral recorded as a result of consolidating securitization trusts under IFRS 10. In 2022 the Group did not obtain any collateral related to these trusts, compared to € 46 million in 2021.

Derivatives – Credit Valuation Adjustment

The bank establishes counterparty Credit Valuation Adjustment (CVA) for OTC derivative transactions to cover expected credit losses. The adjustment amount is determined by assessing the potential credit exposure to a given counterparty and taking into account any collateral held, the effect of any relevant netting arrangements, expected loss given default and the credit risk, based on available market information, including CDS spreads.

Treatment of default situations under derivatives

Unlike standard loan assets, the bank generally has more options to manage the credit risk in its derivatives transactions when movement in the current replacement costs or the behavior of its counterparty indicate that there is the risk that upcoming payment obligations under the transactions might not be honored. In these situations, the bank is frequently able under the relevant derivatives agreements to obtain additional collateral or to terminate and close-out the derivative transactions at short notice.

The master agreements and associated collateralization agreements for OTC derivative transactions executed with its clients typically result in the majority of its credit exposure being secured by collateral. It also provides for a broad set of standard or bespoke termination rights, which allows the bank to respond swiftly to a counterparty's default or to other circumstances which indicate a high probability of failure.

The banks contractual termination rights are supported by internal policies and procedures with defined roles and responsibilities which ensure that potential counterparty defaults are identified and addressed in a timely fashion. These procedures include necessary settlement and trading restrictions. When its decision to terminate derivative transactions results in a residual net obligation owed by the counterparty, the bank restructures the obligation into a non-derivative claim and manage it through its regular work-out process. As a consequence, for accounting purposes the bank typically does not show any nonperforming derivatives.

Wrong-way risk occurs when exposure to a counterparty is adversely correlated with the credit quality of that counterparty. In compliance with Article 291(2) and (4) CRR the bank has a monthly process to monitor several layers of wrong-way risk (specific wrong-way risk, general explicit wrong-way risk at country/industry/region levels and general implicit wrong-way risk, whereby relevant exposures arising from transactions subject to wrong-way risk are automatically selected and presented for comment to the responsible credit officer). A wrong-way risk report is then sent to Credit Risk senior management on a monthly basis. In addition, the bank utilized its established process for calibrating its own alpha factor (as defined in Article 284 (9) CRR) to estimate the overall wrong-way risk in its derivatives and securities financing transactions portfolio. The Private Bank Germany's derivative counterparty risk is immaterial to the Group and collateral held is typically in the form of cash.

Managing and mitigation of credit risk

Managing credit risk on counterparty level

Credit-related counterparties are principally allocated to credit officers within credit teams which are organized by type of counterparty (such as financial institutions, corporates or private individuals), economic area (e.g., Emerging Markets) or product (Structured Credit) and supported by dedicated rating analyst teams where deemed necessary. The individual credit officers have the relevant expertise and experience to manage the credit risks associated with these counterparties and their associated credit related transactions. For retail clients, credit decision making and credit monitoring is highly automated for efficiency reasons. Credit Risk Management has full oversight of the respective processes and tools used in these highly automated retail credit processes. It is the responsibility of each credit officer to undertake ongoing credit monitoring for their allocated portfolio of counterparties. Deutsche Bank also has procedures in place intended to identify at an early-stage credit exposures for which there may be an increased risk of increased risk/ loss.

In instances where Deutsche Bank has identified counterparties where there is a concern that the credit quality has deteriorated or appears likely to deteriorate to the point where they present a heightened risk of default / loss, the respective counterparty is generally placed on the "Watchlist". Deutsche Bank aims to identify those counterparties well in advance that, on the basis of the application of the bank's risk management tools, demonstrate the likelihood of problems well in advance in order to effectively manage the credit exposure and minimize potential losses. The objective of this early warning system is to address potential problems while adequate options for action are still available. This early risk detection is a tenet of Deutsche Bank's credit culture and is designed to raise management awareness of these positions.

Credit limits are established by the Credit Risk Management function via the execution of assigned credit authorities. This also applies to settlement risk that must fall within limits pre-approved by Credit Risk Management considering risk appetite and in a manner that reflects expected settlement patterns for the subject counterparty. Credit approvals are documented by the signing of the credit report by the respective credit authority holders and are retained for future reference.

Credit authority is generally assigned to individuals as personal credit authority according to the individual's professional qualification and experience. All assigned credit authorities are reviewed on a periodic basis to help ensure that they are commensurate with the individual performance of the authority holder.

Where an individual's personal authority is insufficient to establish required credit limits, the transaction is referred to a higher credit authority holder or where necessary to an appropriate credit committee. Where personal and committee authorities are insufficient to establish appropriate limits, the case is referred to the Management Board for approval.

Mitigation of credit risk on counterparty level

In addition to determining counterparty credit quality and the alignment of the exposure with the bank's concentration risk appetite, Deutsche Bank also uses various credit risk mitigation techniques to optimize credit exposure and reduce potential credit losses. Credit risk mitigants are applied in the following forms:

- Comprehensive and enforceable credit documentation with adequate terms and conditions

- Collateral in its various forms to reduce losses by increasing the recovery of obligations; key principles for collateral management include legal effectiveness and enforceability, prudent and realistic collateral valuations, risk and regulatory capital reduction, as well as cost efficiency
- Risk transfers, which shift the risk of default of an obligor to a third-party including hedging executed by the bank's Strategic Corporate Lending (SCL); other de-risking tools such as securitizations etc. may also be employed
- Netting and collateral arrangements which reduce the credit exposure from derivatives and securities financing transactions (e.g. repo transactions)
- Hedging of derivatives counterparty risk including CVA, using primarily CDS contracts via the bank's Counterparty Portfolio Management desk

Collateral

Deutsche Bank regularly agrees on collateral to be received from customers that are subject to credit risk or to be provided by third parties agreed by legally effective and enforceable contracts as documented by a written and reasoned legal opinion. Collateral is credit protection in the form of (funded) assigned or pledged assets or (unfunded) third-party obligations that serves to mitigate the inherent risk of credit loss in an exposure, by either substituting the counterparty default risk or improving recoveries in the event of a default. Deutsche Bank generally takes all types of valuable and eligible collateral for its respective businesses but may limit accepted collateral types for specific businesses or regions as customary in the respective market or driven by purpose of efficiency. While collateral can be an alternative source of repayment, it does not replace the necessity of high-quality underwriting standards and a thorough assessment of the debt service ability of the counterparty in line with Article 194 (9) CRR.

Deutsche Bank distinguishes following two types of collateral received:

- Financial and other collateral, which enables Deutsche Bank to recover all or part of the outstanding exposure by liquidating the collateral asset provided, in cases where the counterparty is unable or unwilling to fulfill its primary obligations. Cash collateral, securities (equity, bonds), collateral pledges or assignments of other claims or inventory, movable assets (i.e., plant, machinery, ships and aircraft) and real estate typically fall into this category. All financial collateral is regularly, mostly daily, revalued and measured against the respective credit exposure. The value of other collateral, including real estate, is monitored based upon established processes that includes regular reviews or revaluations by internal and/or external experts
- Guarantee collateral, which complements the counterparty's ability to fulfill its obligation under the legal contract and as such is provided by uncorrelated third parties. Letters of credit, insurance contracts, export credit insurance, guarantees, credit derivatives and risk participations typically fall into this category. Guarantees and strong letters of comfort provided by correlated group members of customers (generally the parent company) are also accepted and used for risk transfer in approved rating scorecards. Guarantee collateral with a non-investment grade rating of the guarantor is limited

Deutsche Bank's processes seek to ensure that the collateral accepted for risk mitigation purposes is of high quality. This includes processes to generally ensure legally effective and enforceable documentation for realizable and measurable collateral assets which are evaluated within the on-boarding process by dedicated internal appraisers or teams with the respective qualification, skills and experience or adequate external valuers mandated in regulated processes. The applied valuations follow generally accepted valuation methods or models. Ongoing correctness of values is monitored by collateral type specific appropriate frequent and event-driven reviews considering relevant risk parameters. Revaluations are applied in cases of identified probable material deterioration and future monitoring may be adjusted respectively. The assessment of the suitability of collateral for a specific transaction is part of the credit decision and must be undertaken in a conservative way, including collateral haircuts that are applied. Deutsche Bank has collateral type specific haircuts in place which are regularly reviewed and approved. In this regard, Deutsche Bank strives to avoid "wrong-way" risk characteristics where the counterparty's risk is positively correlated with the risk of deterioration in the collateral value. For guarantee collateral, the process for the analysis of the guarantor's creditworthiness is aligned to the credit assessment process for counterparties.

The valuation of collateral is considered under a liquidation scenario. The liquidation value is equal to the expected proceeds of collateral monetization/realization in a base case scenario, wherein a fair price is achieved through careful preparation and orderly liquidation of the collateral. Collateral can either move in value over time (dynamic value) or not (static value). The dynamic liquidation value generally includes a safety margin or haircut over realizable value to address liquidity and marketability aspects.

The Group assigns a liquidation value to eligible collateral, based on, among other things:

- The market value and / or lending value, notional amount or face value of a collateral as a starting point
- The type of collateral; the currency mismatch, if any, between the secured exposure and the collateral; and a maturity mismatch, if any
- The applicable legal environment or jurisdiction (onshore versus offshore collateral)
- The market liquidity and volatility in relation to agreed termination clauses

- The correlation between the performance of the borrower and the value of the collateral, e.g., in the case of the pledge of a borrower's own shares or securities (in this case generally full correlation leads to no liquidation value)
- The quality of physical collateral and potential for litigation or environmental risks; and
- A determined collateral type specific haircut (0 – 100 %) reflecting collection risks (i.e. price risks over the average liquidation period and processing/utilization/sales costs) as specified in the respective policies

Collateral haircut settings are typically based on available historic internal and/or external recovery data (expert opinions may also be used, where appropriate). They also incorporate a forward-looking component in the form of collection and valuation forecast provided by experts within Risk Management. Considering the expected proceeds from the liquidation of the different collateral types, respective value fluctuations, market specific liquidation costs and time applied haircuts vary between 0 to 100 %. When data is not sufficiently available or inconclusive, more conservative haircuts than otherwise used must be applied. Haircut settings are reviewed at least annually.

Risk transfers

Risk transfers to third parties form a key part of the bank's overall risk management process and are executed in various forms, including outright sales, single name and portfolio hedging, and securitizations. Risk transfers are conducted by the respective business units and by Strategic Corporate Lending, in accordance with specifically approved mandates.

Strategic Corporate Lending manages the residual credit risk of loans and lending-related commitments of the institutional and corporate credit portfolio, the leveraged portfolio and the medium-sized German companies' portfolio across the bank's Corporate Bank and Investment Bank divisions.

Acting as a central pricing reference, Strategic Corporate Lending provides the businesses with an observed or derived capital market rate for loan applications; however, the decision of whether or not the business can enter into the credit risk remains exclusively with Credit Risk Management.

Strategic Corporate Lending concentrates on two primary objectives within the credit risk framework to enhance risk management discipline, improve returns and use capital more efficiently:

- To reduce single-name credit risk concentrations within the credit portfolio and
- To manage credit exposures by utilizing techniques including loan sales, securitization via collateralized loan obligations, sub-participations and single-name and portfolio credit default swaps

Netting and collateral arrangements for derivatives and securities financing transactions

Netting is applicable to both exchange traded derivatives and OTC derivatives. Netting is also applied to securities financing transactions (e.g. repurchase, securities lending and margin lending transactions) as far as documentation, structure and nature of the risk mitigation allow netting with the underlying credit risk in accordance with applicable law and the bank's Financial Contracts Netting and Collateral Policy and Procedures – Legal (collectively, "Netting Policies"). While cross-product netting between derivatives and securities financing transactions may be used in certain cases, the bank does not make use of cross-product netting for regulatory purposes.

All exchange traded derivatives are cleared through central counterparties (CCPs), which interpose themselves between the trading entities by becoming the counterparty to each of the entities. Where legally required or where available and to the extent agreed with the bank's counterparties, Deutsche Bank also uses CCP clearing for its OTC derivative transactions.

The Dodd-Frank Act and related Commodity Futures Trading Commission (CFTC) rules require CCP clearing in the United States for certain standardized OTC derivative transactions, including certain interest rate swaps and index credit default swaps, subject to limited exceptions when facing certain counterparties. The European Regulation (EU) No 648/2012 on OTC Derivatives, Central Counterparties and Trade Repositories (EMIR) and the Commission Delegated Regulations (EU) 2015/2205, (EU) 2015/592 and (EU) 2016/1178 based thereupon introduced mandatory CCP clearing in the EU for certain standardized OTC derivatives transactions. Mandatory CCP clearing in the EU began for certain interest rate derivatives on June 21, 2016 and for certain iTraxx-based credit derivatives and additional interest rate derivatives on February 9, 2017. Article 4 (2) of EMIR authorizes competent authorities to exempt intragroup transactions from mandatory CCP clearing, provided certain requirements, such as full consolidation of the intragroup transactions and the application of an appropriate centralized risk evaluation, measurement and control procedure are met. The bank successfully applied for the clearing exemption for a number of its regulatory-consolidated subsidiaries with intragroup derivatives, including e.g., Deutsche Bank Securities Inc. and Deutsche Bank Luxembourg S.A. As of December 31, 2022, the bank is allowed to make use of intragroup exemptions from the EMIR clearing obligation for 58 bilateral intragroup relationships. The extent of the exemptions differs as not all entities enter into relevant transaction types subject to the clearing obligation. Of the 58 intragroup relationships, 14 are relationships where both entities are established in the Union (EU) for which a full exemption has been granted, and 44 are relationships where one is established in a third country ("Third Country Relationship"). Third Country Relationships required repeat applications for each new asset class being subject to the clearing obligation; the process took place in the course of 2017. Due to "Brexit", the status of some group entities has changed from an EU entity to a third country entity, but there has been no impact for the bank in respect clearing exemptions.

The rules and regulations of CCPs typically provide for the bilateral set off of all amounts payable on the same day and in the same currency ("payment netting") thereby reducing the bank's settlement risk. Depending on the business model applied by the CCP, this payment netting applies either to all of the bank's derivatives cleared by the CCP or at least to those that form part of the same class of derivatives. Many CCPs' rules and regulations also provide for the termination, close-out and netting of all cleared transactions upon the CCP's default ("close-out netting"), which reduces the bank's credit risk. In its risk measurement and risk assessment processes Deutsche Bank applies close-out netting only to the extent Deutsche Bank believes that the relevant CCP's close-out netting provisions are legally valid and enforceable and have been approved in accordance with the bank's Netting Policies.

In order to reduce the credit risk resulting from OTC derivative transactions, where CCP clearing is not available, Deutsche Bank regularly seeks the execution of standard master agreements (such as master agreements for derivatives published by the International Swaps and Derivatives Association, Inc. (ISDA) or the German Master Agreement for Financial Derivative Transactions) with the bank's counterparties. A master agreement allows for the close-out netting of rights and obligations arising under derivative transactions that have been entered into under such a master agreement upon the counterparty's default, resulting in a single net claim owed by or to the counterparty. Payment netting may be agreed from time to time with the bank's counterparties for multiple transactions having the same payment dates (e.g., foreign exchange transactions) pursuant to the terms of master agreements which can, reduce the bank's settlement risk. In its risk measurement and risk assessment processes Deutsche Bank applies close-out netting only to the extent Deutsche Bank has concluded that the master agreement is legally valid and enforceable in all relevant jurisdictions and the recognition of close-out netting has been approved in accordance with the bank's Netting Policies.

Deutsche Bank also enters into credit support annexes (CSAs) to master agreements in order to further reduce the bank's derivatives-related credit risk. These annexes generally provide risk mitigation through periodic, usually daily, margining of the covered exposure. The CSAs also provide for the right to terminate the related derivative transactions upon the counterparty's failure to honor a margin call. As with netting, when Deutsche Bank believes the annex is enforceable, Deutsche Bank reflects this in its exposure measurement.

Certain CSAs to master agreements provide for rating-dependent triggers, where additional collateral must be pledged if a party's rating is downgraded. Deutsche Bank also enters into master agreements that provide for an additional termination event upon a party's rating downgrade. These downgrade provisions in CSAs and master agreements usually apply to both parties but in some agreements may apply to Deutsche Bank only. Deutsche Bank analyzes and monitor its potential contingent payment obligations resulting from a rating downgrade in its stress testing and liquidity coverage ratio approach for liquidity risk on an ongoing basis. For an assessment of the quantitative impact of a downgrading of the bank's credit rating please refer to table "Stress Testing Results" in the section "Liquidity Risk".

The Dodd-Frank Act and CFTC rules thereunder, including CFTC rule § 23.504, as well as EMIR and Commission Delegated Regulation based thereon, namely Commission Delegated Regulation (EU) 2016/2251, introduced the mandatory use of master agreements and related CSAs, which must be executed prior to or contemporaneously with entering into an uncleared OTC derivative transaction. Certain documentation is also required by the U.S. margin rules adopted by U.S. prudential regulators. Under the U.S. prudential regulators' margin rules, Deutsche Bank is required to post and collect initial margin for its derivatives exposures with other derivatives dealers, as well as with the bank's counterparties that (a) are "financial end users," as that term is defined in the U.S. margin rules, and (b) have an average daily aggregate notional amount of uncleared swaps, uncleared security-based swaps, foreign exchange forwards and foreign exchange swaps exceeding U.S.\$ 8 billion in June, July and August of the previous calendar year. The U.S. margin rules additionally requires Deutsche Bank to post and collect variation margin for its derivatives with other derivatives dealers and certain financial end user counterparties. These margin requirements are subject to a U.S.\$ 50 million threshold for initial margin, but no threshold for variation margin, with a combined U.S.\$ 500,000 minimum transfer amount. The U.S. margin requirements have been in effect for large banks since September 2016, with additional variation margin requirements having come into effect March 1, 2017 and additional initial margin requirements are being phased in from September 2017 through September 2022.

Under Commission Delegated Regulation (EU) 2016/2251, which implements the EMIR margin requirements, the CSA must provide for daily valuation and daily variation margining based on a zero threshold and a minimum transfer amount of not more than € 500,000. For large derivative exposures exceeding € 8 billion, initial margin has to be posted as well. The variation margin requirements under EMIR apply as of March 1, 2017; the initial margin requirements originally were subject to a staged phase-in until September 1, 2021. However, legislative changes published on February 17, 2021 extended deadlines into 2022. Under Article 31 of Commission Delegated Regulation (EU) 2016/2251, an EU party may decide to not exchange margin with counterparties in certain non-netting jurisdictions provided certain requirements are met. Pursuant to Article 11 (5) to (10) of EMIR, competent authorities are authorized to exempt intragroup transactions from the margining obligation, provided certain requirements are met. While some of those requirements are the same as for the EMIR clearing exemptions (see above), there are additional requirements such as the absence of any current or foreseen practical or legal impediment to the prompt transfer of funds or repayment of liabilities between intragroup counterparties. The bank is making use of this exemption. The bank has successfully applied for the collateral exemption for some of its regulatory-consolidated subsidiaries with intragroup derivatives, including, e.g., Deutsche Bank Securities Inc. and Deutsche Bank Luxembourg S.A. As of December 31, 2022, the bank is allowed to use intragroup exemptions from the EMIR collateral obligation for a number of bilateral intragroup relationships which are published under [db.com/legal-resources/european-market-infrastructure-regulation/intra-group-exemptions-margining](https://www.db.com/legal-resources/european-market-infrastructure-regulation/intra-group-exemptions-margining). For some bilateral intragroup relationships, the EMIR margining exemption may be used based on Article 11 (5) of EMIR, i.e. without the need for any application or publication, because both entities are established in the same EU Member State. For third country subsidiaries, the intragroup exemption was originally limited until the earlier of June 30, 2022 and four months after the publication of an equivalence decision by the EU Commission under Article 13(2) EMIR, unless, in the case of an equivalence decision being applicable, a follow-up exemption application is made and granted. On February 13, 2023, an amendment to Regulation (EU) 2016/2251 has been published in the Official Journal, which amendment relates to the extension of the exemption end date until June 30, 2025. While the application requirement may be abolished with “EMIR 3.0” (see European Commission proposal COM (2022) 697 final), Deutsche Bank continues to have processes in place ensuring readiness for intragroup margining should the need arise.

Concentrations within credit risk mitigation

Concentrations within credit risk mitigations taken may occur if a number of guarantors and credit derivative providers with similar economic characteristics are engaged in comparable activities with changes in economic or industry conditions affecting their ability to meet contractual obligations. Concentration risk may also occur in collateral portfolios (e.g. multiple claims and receivables against third parties) which are considered conservatively within the valuation process and/or on-site inspections where applicable. Deutsche Bank uses a range of tools and metrics to monitor its credit risk mitigating activities and potential concentrations.

For more qualitative and quantitative details in relation to the application of credit risk mitigation and potential concentration effects please refer to the section “Maximum exposure to credit risk”.

Managing credit risk on portfolio level

Enterprise Risk & Credit Risk Portfolio Management sets the framework for the management of concentration risks at a portfolio level. This includes strategically setting, monitoring, reviewing, reporting, and controlling credit risk appetites across various dimensions such as group, division, business unit, legal entity, branch, country, and industry level that need to be considered in the context of credit approvals. In addition, Enterprise Risk & Credit Risk Portfolio Management also provides a comprehensive and holistic view of the bank’s risk profile across risk types.

On a portfolio level, significant concentrations of credit risk could result from having material exposures to a number of counterparties with similar economic characteristics, or who are engaged in comparable activities, where these similarities may cause their ability to meet contractual obligations to be affected in the same manner by changes in economic or industry conditions.

Deutsche Bank’s portfolio management framework supports a comprehensive assessment of concentrations within its credit risk portfolio in order to keep concentrations within acceptable levels.

Risk and portfolio developments are regularly discussed at the Credit Risk Appetite and Portfolio Management Forum which includes representation from across the Credit Risk Management function including the Head of Credit Risk Management.

Industry risk management

To manage industry risk, Deutsche Bank has grouped its corporate and financial institutions counterparties into various industry sub-portfolios. Portfolios are regularly reviewed with the frequency of review dependent on portfolio size and risk profile as well as risk developments. Larger / riskier portfolios are reviewed at least on an annual basis. Reviews highlight industry developments and risks to the bank’s credit portfolio, review cross-risk concentration risks, analyze the risk/reward profile of the portfolio and incorporate the results of an economic downside stress test. Finally, this analysis is used to define the credit strategies for the portfolio in question.

In the bank's industry limit framework, thresholds are established for aggregate credit limits to counterparties within each industry sub-portfolio. For risk management purposes, the aggregation of limits across industry sectors follows an internal risk view that does not have to be congruent with NACE (Nomenclature des Activités Economiques dans la Communauté Européenne) code-based view applied elsewhere in this report. Regular industry portfolio overviews are prepared for the Enterprise Risk Committee to discuss recent developments and to agree on actions where necessary.

Beyond credit risk, the bank's industry risk framework comprises of thresholds for Traded Credit Positions while key industry relevant non-financial risks are closely monitored.

Country risk management

Avoiding undue concentrations from a regional and country perspective is also an integral part of the bank's credit risk management framework. In order to achieve this, country risk thresholds are applied to countries in Non-Japan Asia, Central Eastern Europe, Middle East & Africa and Latin America as well as selected Developed Markets countries (based on internal country risk ratings). Similar to industry risk, country portfolios are regularly reviewed with the frequency of review dependent on portfolio size and risk profile as well as risk developments. Larger/riskier portfolios are reviewed at least on an annual basis. These reviews assess amongst other factors, key macroeconomic and political risk developments and outlook; portfolio composition, quality and cross-risk concentrations under normal and stress conditions; analyze the risk/reward profile of the portfolio. Based on this and taking into account the Group's Risk Appetite and strategy, country risk appetite and strategies are set.

In the bank's country risk framework, thresholds are established for counterparty credit risk exposures in each country to manage the aggregate credit risk subject to country-specific economic and political events. These thresholds cover exposures to entities incorporated locally and subsidiaries of foreign multinational corporations as well as companies with significant economic or operational dependence on a specific country even though they are incorporated externally. In addition, gap risk thresholds are set to control the risk of loss due to intra-country wrong-way risk exposure. As such, for risk management purposes, the aggregation of exposures across countries follows an internal risk view that may differ from the geographical exposure view applied elsewhere in this report. Beyond credit risk, the bank's country risk framework comprises thresholds for trading positions that measure the aggregate market value of traded credit risk positions. For Emerging Markets, thresholds are also set to measure the profit and loss impact under specific country stress scenarios on trading positions across the bank's portfolio. Furthermore, thresholds are set for capital and intra-group funding exposure of Deutsche Bank entities in above countries given the transfer risk inherent in these cross-border positions. Key non-financial risks are closely monitored. Deutsche Bank's country risk ratings represents a key tool in its management of country risk. They include:

- Sovereign rating (set and managed by ERM): A measure of the probability of the sovereign defaulting on its foreign or local currency obligations
- Transfer risk rating (set and managed by ERM): A measure of the probability of a "transfer risk event", i.e., the risk that an otherwise solvent debtor is unable to meet its obligations due to inability to obtain foreign currency or to transfer assets as a result of direct sovereign intervention

All sovereign and transfer risk ratings are reviewed, at least on an annual basis.

Product/Asset class specific risk management

Complementary to the bank's counterparty, industry and country risk approach, Deutsche Bank focuses on certain product/asset class specific risk concentrations and set limits or thresholds where required for risk management purposes. Specific risk limits are set in particular if a concentration of transactions of a specific type might lead to significant losses under certain conditions. In this respect, correlated losses might result from disruptions in the functioning of financial markets, significant moves in market parameters to which the respective product or asset class is sensitive to, or other risk drivers common to the asset class.

Underwriting of capital markets transactions

Specific focus is placed on transactions with underwriting risks where Deutsche Bank underwrites commitments with the intention to sell down or distribute part of the risk to third parties. These commitments include the undertaking to provide bank loans for syndication into the debt capital market and bridge loans for the issuance of notes. The inherent risks of being unsuccessful in the distribution of the facilities or the placement of the notes, comprise of a delayed distribution, funding of the underlying loans as well as a pricing risk as some underwriting commitments are additionally exposed to market risk in the form of widening credit spreads. Where applicable, Deutsche Bank dynamically hedges this credit spread risk to be within the approved market risk limit framework.

A major product, in which Deutsche Bank is active in underwriting, is leverage lending, which Deutsche Bank mainly executes through its Leveraged Debt Capital Markets business unit. The business model is a fee-based, originate to distribute approach focused on the distribution of largely unfunded underwriting commitments into the capital market. The afore mentioned risks regarding distribution and credit spread movement apply to this business unit, however, are managed under a range of specific notional as well as market risk limits. The latter require the business to also hedge its underwriting pipeline against market dislocations. The fee-based model of the bank's Leveraged Debt Capital Markets business unit includes a restrictive approach to single-name risk concentrations retained on Deutsche Bank's balance sheet, which results in a diversified overall portfolio without any material concentrations. The resulting longer-term on-balance sheet portfolio is also subject to a comprehensive credit limit and hedging framework.

Deutsche Bank also assumes underwriting risk with respect to Commercial Real Estate loans, primarily in the Commercial Real Estate business unit in the Investment Bank where loans may be originated with the intent to securitize in the capital markets or syndicate to other lenders. The afore mentioned inherent underwriting risks such as delayed distribution and pricing risk are managed through notional caps, market risk limits and hedging against the risk of market dislocations.

In addition to underwriting risk, Deutsche Bank also focuses on concentration of transactions with specific risk dynamics (including risk to commercial real estate and risk from securitization positions).

In addition, the bank's Private Bank and certain Corporate Bank businesses are managed via product-specific strategies setting the bank's risk appetite for portfolios with similar credit risk characteristics, such as the retail portfolios of mortgages and consumer finance products as well as products for business clients. Here risk analyses are performed on portfolio level including further breakdown into business units as well as countries/regions. Analysis for individual clients is of secondary importance. In Wealth Management, target levels are set for global concentrations along products as well as based on type and liquidity of collateral.

Market Risk Management

Market Risk framework

The vast majority of Deutsche Bank's businesses are subject to market risk, defined as the potential for change in the market value of the Group's trading and invested positions. Risk can arise from changes in interest rates, credit spreads, foreign exchange rates, equity prices, commodity prices and other relevant parameters, such as market volatility and market implied default probabilities. The market risk can affect accounting, economic and regulatory views of the exposure.

Market Risk Management is part of Deutsche Bank's independent Risk function and sits within the Market and Valuations Risk Management group. One of the primary objectives of Market Risk Management is to ensure that the business units' risk exposure is within the approved risk appetite commensurate with its defined strategy. To achieve this objective, Market Risk Management works closely together with risk takers ("the business units") and other control and support groups.

The Group distinguishes between three substantially different types of market risk:

- Trading market risk arises primarily through the market-making and client facilitation activities of the Investment Bank and Corporate Bank divisions. This involves taking positions in debt, equity, foreign exchange, other securities and commodities as well as in equivalent derivatives
- Traded default risk arising from defaults and rating migrations relating to trading instruments
- Non-trading market risk arises from market movements, primarily outside the activities of the trading units, in the banking book and from off-balance sheet items; this includes interest rate risk, credit spread risk, investment risk and foreign exchange risk as well as market risk arising from pension schemes, guaranteed funds and equity compensation; non-trading market risk also includes risk from the modeling of client deposits as well as savings and loan products

Market Risk Management governance is designed and established to promote oversight of all market risks, effective decision-making and timely escalation to senior management.

Market Risk Management defines and implements a framework to systematically identify, assess, monitor and report the Group's market risk. Market risk managers identify market risks through active portfolio analysis and engagement with the business units.

Market Risk measurement

The Group aims to accurately measure all types of market risks by a comprehensive set of risk metrics embedding accounting, economic and regulatory considerations.

The market risks are measured by several internally developed key risk metrics and regulatory defined market risk approaches.

Trading Market Risk

The Group's primary mechanism to manage trading market risk is the application of risk appetite framework of which the limit framework is a key component. The Management Board, supported by Market Risk Management, sets group-wide value-at-risk, economic capital and portfolio stress testing limits for market risk in the trading book. Market Risk Management allocates this overall appetite to the Corporate Divisions and their individual business units based on established and agreed business plans. Deutsche Bank also has business aligned heads within Market Risk Management who establish business unit limits, by allocating the limit down to individual portfolios, geographical regions and types of market risks.

Value-at-risk, economic capital and portfolio stress testing limits are used for managing all types of market risk at an overall portfolio level. As an additional and important complementary tool for managing certain portfolios or risk types, Market Risk Management performs risk analysis and business specific stress testing. Limits are also set on sensitivity and concentration/liquidity, exposure, business-level stress testing and event risk scenarios, taking into consideration business plans and the risk vs return assessment.

Business units are responsible for adhering to the limits against which exposures are monitored and reported. The market risk limits set by Market Risk Management are monitored on a daily, weekly and monthly basis, dependent on the risk management tool being used.

Internally developed Market Risk Models

Value-at-Risk (VaR)

VaR is a quantitative measure of the potential loss (in value) of Fair Value positions due to market movements that should not be exceeded in a defined period of time and with a defined confidence level.

The Group's value-at-risk for the trading businesses is based on internal model approach. In October 1998, the German Banking Supervisory Authority (now the BaFin) approved the bank's internal model for calculating the regulatory market risk capital for general and specific market risks based on a sensitivity based Monte Carlo approach. In October 2020, the ECB approved a significant change to the VaR model, now a Historical Simulation approach predominantly utilizing full revaluation, although some portfolios remain on a sensitivity based approach. The new approach is used for both Risk Management and capital requirements.

The new approach provides more accurate modelling of the risks, enhances the Group's analysis capabilities and provides a more effective tool for risk management. Aside from enabling a more accurate view of market risk, the implementation of Historical Simulation VaR has brought about an even closer alignment of the market risk systems and models to the end of day pricing.

Risk management VaR is calibrated to a 99 % confidence level and a one day holding period. This means we estimate there is a 1 in 100 chance that a mark-to-market loss from our trading positions will be at least as large as the reported VaR. For regulatory capital purposes, the VaR model is calibrated to a 99 % confidence interval and a ten day holding period.

The calculation employs a Historical Simulation technique that uses one year of historical market data as input and observed correlations between the risk factors during this one year period.

The VaR model is designed to take into account a comprehensive set of risk factors across all asset classes. Key risk factors are swap/government curves, index and issuer-specific credit curves, single equity and index prices, foreign exchange rates, commodity prices as well as their implied volatilities. To help ensure completeness in the risk coverage, second order risk factors, e.g. money market basis, implied dividends, option-adjusted spreads and precious metals lease rates are also considered in the VaR calculation. The list of risk factors include in the VaR model is reviewed regularly and enhanced as part of ongoing model performance reviews.

The model incorporates both linear and, especially for derivatives, nonlinear impacts predominantly through a full revaluation approach but it also utilizes a sensitivity-based approach for certain portfolios. The full revaluation approach uses the historical changes to risk factors as input to pricing functions. Whilst this approach is computationally expensive, it does yield a more accurate view of market risk for nonlinear positions, especially under stressed scenarios. The sensitivity based approach uses sensitivities to underlying risk factors in combination with historical changes to those risk factors.

For each business unit a separate VaR is calculated for each risk type, e.g. interest rate risk, credit spread risk, equity risk, foreign exchange risk and commodity risk. "Diversification effect" reflects the fact that the total VaR on a given day will be lower than the sum of the VaR relating to the individual risk types. Simply adding the VaR figures of the individual risk types to arrive at an aggregate VaR would imply the assumption that the losses in all risk types occur simultaneously.

The VaR enables the Group to apply a consistent measure across the fair value exposures. It allows a comparison of risk in different businesses, and also provides a means of aggregating and netting positions within a portfolio to reflect correlations and offsets between different asset classes. Furthermore, it facilitates comparisons of the market risk both over time and against the daily trading results.

When using VaR results a number of considerations should be taken into account. These include:

- The use of historical market data may not be a good indicator of potential future events, particularly those that are extreme in nature; this "backward-looking" limitation can cause VaR to understate future potential losses (as in 2008), but can also cause it to be overstated immediately following a period of significant stress (as in COVID-19 pandemic)
- The one day holding period does not fully capture the market risk arising during periods of illiquidity, when positions cannot be closed out or hedged within one day
- VaR does not indicate the potential loss beyond the 99th quantile
- Intra-day risk is not reflected in the end of day VaR calculation
- There may be risks in the trading or banking book that are not fully captured in the VaR model (either partially captured or missing entirely)

The process of systematically capturing and evaluating risks currently not captured in the bank's VaR model has been further developed and improved. An assessment is made to determine the level of materiality of these risks and material risks are prioritized for inclusion in the bank's internal model. Risks not in VaR are monitored and assessed on a regular basis through the Risk Not In VaR (RNIV) framework. This framework has also undergone a significant overhaul in 2020. This includes aligning the methodologies with the Historical Simulation approach which in turn yields a more accurate estimate of the contribution of these missing items and their potential capitalization.

Deutsche Bank is committed to the ongoing development of the internal risk models, and substantial resources are allocated to review, validate and improve them.

Stressed Value-at-Risk

Stressed Value-at-Risk (SVaR) calculates a stressed value-at-risk measure based on a one year period of significant market stress. The Group calculates a stressed value-at-risk measure using a 99 % confidence level. Stressed VaR is calculated with a holding period of ten days. The SVaR calculation utilizes the same systems, trade information and processes as those used for the calculation of value-at-risk. The only difference is that historical market data and observed correlations from a period of significant financial stress (i.e., characterized by high volatilities) is used as an input for the Historical Simulation.

The stress period selection process for the stressed value-at-risk calculation is based on the comparison of VaR calculated using historical time windows compared to the current SVaR. If a historical window produces a VaR which is higher than the current SVaR, it is further investigated and the SVaR window can then subsequently be updated accordingly. This process runs on a quarterly basis.

During 2022, the stress period selection process for DB Group was conducted as outlined above. As a result, the SVaR window used at various periods in 2022 included the Financial credit crisis of 2008/09 and the more recent COVID-19 stress period of 2020.

Incremental Risk Charge

Incremental Risk Charge captures default and credit rating migration risks for credit-sensitive positions in the trading book. The Group uses a Monte Carlo Simulation for calculating incremental risk charge as the 99.9 % quantile of the portfolio loss distribution over a one-year capital horizon under a constant position approach and for allocating contributory incremental risk charge to individual positions.

The model captures the default and migration risk in an accurate and consistent quantitative approach for all portfolios. Important parameters for the incremental risk charge calculation are exposures, recovery rates, maturities, ratings with corresponding default and migration probabilities and parameters specifying issuer correlations.

Market Risk Standardized Approach

The Market Risk Standardized Approach ("MRSA") is used to determine the regulatory capital charge for the specific market risk of trading book securitizations, for certain types of investment funds and for longevity risk as set out in CRR/CRD regulations.

Longevity risk is the risk of adverse changes in life expectancies resulting in a loss in value on longevity linked policies and transactions. For risk management purposes, stress testing and economic capital allocations are also used to monitor and manage longevity risk.

Market Risk Stress Testing

Stress testing is a key risk management technique, which evaluates the potential effects of extreme market events and movements in individual risk factors. It is one of the core quantitative tools used to assess the market risk of Deutsche Bank's positions and complements VaR and Economic Capital. Market Risk Management performs several types of stress testing to capture the variety of risks (Portfolio Stress Testing, individual specific stress tests and Event Risk Scenarios) and also contributes to Group-wide stress testing. These stress tests cover a wide range of severities designed to test the earnings stability and capital adequacy of the bank.

Trading Market Risk Economic Capital

Deutsche Bank's trading market risk economic capital model-scaled Stressed VaR based EC (SVaR based EC) - comprises two core components, the "common risk" component covering risk drivers across all businesses and the "business-specific risk" component, which enriches the Common Risk via a suite of Business Specific Stress Tests. Both components are calibrated to historically observed severe market shocks. Common risk is calculated using a scaled version of the SVaR framework while Business Specific Stress Tests are designed to capture more product/business-related bespoke risks (e.g. complex basis risks) as well as higher order risks not captured in the common risk component. The SVaR based EC uses the Monte Carlo SVaR framework.

Traded Default Risk Economic Capital

The Traded Default Risk Economic Capital captures the relevant credit exposures across our trading and fair value banking books. Trading book exposures are monitored by Market Risk Management via single name concentration and portfolio thresholds which are set based upon rating, size and liquidity. Single name concentration risk thresholds are set for two key metrics: Default Exposure, i.e., the P&L impact of an instantaneous default at the current recovery rate, and bond equivalent Market Value, i.e. default exposure at 0 % recovery. In order to capture diversification and concentration effects we perform a joint calculation for traded default risk economic capital and credit risk economic capital. Important parameters for the calculation of traded default risk are exposures, recovery rates and default probabilities as well as maturities. The probability of joint rating downgrades and defaults is determined by the default and rating correlations of the portfolio model. These correlations are specified through systematic factors that represent countries, geographical regions and industries.

Trading Market Risk Reporting

Market Risk Management reporting creates transparency on the risk profile and facilitates the understanding of core market risk drivers to all levels of the organization. The Management Board and Senior Governance Committees receive regular reporting, as well as ad hoc reporting as required, on market risk, regulatory capital and stress testing. Senior Risk Committees receive risk information at a number of frequencies, including weekly or monthly.

Additionally, Market Risk Management produces daily and weekly Market Risk specific reports and daily limit utilization reports for each business owner.

Regulatory prudent valuation of assets carried at fair value

Pursuant to Article 34 CRR, institutions shall apply the prudent valuation requirements of Article 105 CRR to all assets measured at fair value and shall deduct from CET 1 capital the amount of any additional value adjustments necessary.

We determined the amount of the additional value adjustments based on the methodology defined in the Commission Delegated Regulation (EU) 2016/101.

As of December 31, 2022 the amount of the additional value adjustments was € 2.02 billion. The December 31, 2021 amount was € 1.8 billion. The increase was predominantly due to the diversification benefit factor reverting back to normal levels after the amendment via Commission Delegated Regulation (EU) 2020/866 that provided temporary relief to account for the extreme market volatility due to the COVID-19 pandemic.

As of December 31, 2022 the reduction of the expected loss from subtracting the additional value adjustments was € 123 million, which partly mitigated the negative impact of the additional value adjustments on our CET 1 capital. —

Non-trading Market Risk

Non-trading market risk arises primarily from activities outside of the trading units, in the banking book, including pension schemes and guarantees, and embedding considerations of different accounting treatments of transactions. Significant market risk factors the Group is exposed to and are overseen by risk management groups in that area are interest rate risk (including risk from embedded optionality and changes in behavioral patterns for certain product types), credit spread risk, foreign exchange risk (including structural foreign exchange risk), equity risk (including equity compensation related risk and investments in public and private equity as well as real estate, infrastructure and fund assets).

As for trading market risks the Group's risk appetite and limit framework is also applied to manage our exposure to non-trading market risk. On group level those are captured by the management board set limits for market risk economic capital capturing exposures to all market risks across asset classes as well as earnings and economic value based limits for interest rate risk in the banking books. Those limits are cascaded down by market risk management to the divisional or portfolio level. The limit framework for non-trading market risk exposure is further complemented by a set of business specific stress tests, value-at-risk & sensitivity limits monitored on a daily or monthly basis dependent on the risk measure being used.

Interest Rate Risk in the Banking Book

Interest rate risk in the banking book (IRRBB) is the current or prospective risk, to both the Group's capital and earnings, arising from movements in interest rates, which affect the Group's banking book exposures. This includes gap risk, which arises from the term structure of banking book instruments, basis risk, which describes the impact of relative changes in interest rates for financial instruments that are priced using different interest rate curves, as well as option risk, which arises from option derivative positions or from optional elements embedded in financial instruments.

The Group manages its IRRBB exposures using economic value as well as earnings based measures. The Group Treasury function is mandated to manage the interest rate risk centrally, with Market Risk Management acting as "2nd Line of Defense" (LoD) independently assessing and challenging the implementation of the framework and adherence to the risk appetite. Group Audit in its role as the "3rd LoD" is accountable for providing independent and objective assurance on the adequacy of the design, operating effectiveness and efficiency of the risk management system and systems of internal control. The Group Asset & Liability Committee ("ALCo") oversees and steers the Group's structural interest risk position with particular focus on banking book risks and the management of the net interest income. The ALCo monitors the sensitivity of financial resources and associated metrics to key market parameters such as interest rate curves and oversees adherence to divisional/business financial resource limits.

Economic value based measures look at the change in economic value of banking book assets, liabilities and off-balance sheet exposures resulting from interest rate movements, independent of the accounting treatment. Thereby the Group measures the change in economic value of equity (Δ EVE) as the maximum decrease of the banking book economic value under the six standard scenarios defined by the EBA in addition to internal stress scenarios for risk steering purposes. For the reporting of internal stress scenarios and risk appetite the Group applies a few different modelling assumptions as used in this disclosure. When aggregating the economic value of equity Δ EVE across different currencies, DB adds up negative and positive changes without applying weight factors for positive changes. Furthermore, the Group is using behavioral model assumptions about the interest rate duration of own equity capital as well as non-maturity deposits from financial institutions.

Earnings-based measures look at the expected change in net interest income (NII) resulting from interest rate movements over a defined time horizon, compared to a defined benchmark scenario. Thereby the Group measures net interest income Δ NII as the maximum reduction under the six standard scenarios defined by the EBA in addition to internal stress scenarios for risk steering purposes, compared to a market implied curve scenario, over a period of 12 months.

The Group employs mitigation techniques to hedge the interest rate risk arising from non-trading positions within given limits. The interest rate risk arising from non-trading asset and liability positions is managed through Treasury Markets & Investments. Thereby the Group uses derivatives and applies different hedge accounting techniques such as fair value hedge accounting or cash flow hedge accounting. For fair value hedges, the Group uses interest rate swaps and options contracts to manage the fair value movements of fixed rate financial instruments due to changes in benchmark interest. For hedges in the context of the cash flow hedge accounting, the Group uses interest rate swaps to manage the exposure to cash flow variability of the variable rate instruments as a result of changes in benchmark interest rates.

The Group assesses and measures hedge effectiveness of a hedging relationship based on the change in the fair value or cash flows of the derivative hedging instrument relative to the change in the fair value or cash flows of the hedged item attributable to the hedged risk.

The "Model Risk Management" function performs independent validation of models used for IRRBB measurement, as per all market risk models, in line with Deutsche Bank's group-wide risk governance framework.

The calculation of VaR and sensitivities of interest rate risk is performed daily, whereas the measurement and reporting of economic value interest rate and earnings risk is performed on a monthly basis. The Group generally uses the same metrics in its internal management systems as it applies for the disclosure in this report.

Deutsche Bank's key modelling assumptions are applied to the positions in the Private Bank and Corporate Bank divisions. Those positions are subject to risk of changes in client's behavior with regard to their deposits as well as loan products. The Group regularly tests the assumptions and updates them where appropriate following a defined governance process. In particular, the Group has made changes to its assumptions during the early phase of rising interest rates where a slower repricing in deposits was observed than it was anticipated.

The Group manages the interest rate risk exposure of its non-maturity deposits through a replicating portfolio approach to determine the average repricing maturity of the portfolio. For the purpose of constructing the replicating portfolio, the portfolio of non-maturity deposits is clustered by dimensions such as business unit, currency, product and geographical location. The main dimensions influencing the repricing maturity are elasticity of deposit rates to market interest rates, volatility of deposit balances and observable client behavior. For the reporting period the average repricing maturity assigned across all such replicating portfolios is 1.98 years and Deutsche Bank uses 15 years as the longest repricing maturity.

In the loan and some of the term deposit products Deutsche Bank considers early prepayment/withdrawal behavior of its customers. The parameters are based on historical observations, statistical analyses and expert assessments.

Furthermore, the Group generally calculates IRRBB related metrics in contractual currencies and aggregates the resulting metrics for reporting purposes. When calculating economic value based metrics the commercial margin is excluded for material parts of the balance sheet.

Credit Spread Risk in the Banking Book

Deutsche Bank is exposed to credit spread risk of bonds held in the banking book, mainly as part of the Treasury Liquidity Reserves portfolio. The credit spread risk in the banking book is managed by the businesses, with Market Risk Management acting as an independent oversight function ensuring that the exposure is within the approved risk appetite. This risk category is closely associated with interest rate risk in the banking book as changes in the perceived credit quality of individual instruments may result in fluctuations in spreads relative to underlying interest rates. The calculation of credit spread sensitivities and value-at-risk for credit spread exposure is in general performed on a daily basis, the measurement and reporting of economic capital and stress tests are performed on a monthly basis.

Foreign exchange risk

Foreign exchange risk arises from non-trading asset and liability positions that are denominated in currencies other than the functional currency of the respective entity. The majority of this foreign exchange risk is transferred through internal hedges to trading books within the Investment Bank and is therefore reflected and managed via the value-at-risk figures in the trading books. The remaining foreign exchange risks that have not been transferred are mitigated through match funding the investment in the same currency, so that only residual risk remains in the portfolios. Small exceptions to above approach follow the general Market Risk Management monitoring and reporting process, as outlined for the trading portfolio.

The bulk of non-trading open foreign exchange risk arises from the foreign exchange translation of local capital into the reporting currency of DB Group and related capital hedge positions. Thereby structural open long positions are taken for a selected number of relevant currencies to immunize the sensitivity of the capital ratio of the Group against changes in the exchange rates.

Equity and investment risk

Non-trading equity risk is arising predominantly from our non-consolidated investment holdings in the banking book and from our equity compensation plans.

Deutsche Bank's non-consolidated equity investment holdings in the banking book are categorized into strategic and alternative investment assets. Strategic investments typically relate to acquisitions made to support the bank's business franchise and are undertaken with a medium to long-term investment horizon. Alternative assets are comprised of principal investments and other non-strategic investment assets. Principal investments are direct investments in private equity, real estate, venture capital, hedge or mutual funds whereas assets recovered in the workout of distressed positions or other legacy investment assets in private equity and real estate are of a non-strategic nature.

Investment proposals for strategic investments as well as monitoring of progress and performance against committed targets are evaluated by the Group Investment Committee. Depending on size, strategic investments may require approval from the Group Investment Committee, the Management Board or the Supervisory Board.

Credit Risk Management Principal Investments is responsible for the risk-related governance and monitoring of our alternative asset activities. The review of new or increased principal investment commitments is the task of the Principal Investment Commitment Approval Group, established by the Enterprise Risk Committee as a risk management forum for alternative asset investments. The Principal Investment Commitment Approval Group approves investments under its authority or recommends decisions above its authority to the Management Board for approval. The Management Board also sets investment limits for business divisions and various portfolios of risk upon recommendation by the Enterprise Risk Committee.

The equity investment holdings are included in regular group wide stress tests and the monthly market risk economic capital calculations.

Pension risk

The Group is exposed to market risks from defined benefit pension schemes for past and current employees. Market risks in pension plans materialize due to a potential decline in the market value of plan assets or an increase in the present value of the pension liability of each of the pension plans. Market Risk Management is responsible for a regular measurement, monitoring, reporting and control of market risks of the asset and liability side of the defined benefit pension plans. Thereby, market risks in pension plans include but are not restricted to interest rate risk, inflation risk, credit spread risk, equity risk, and longevity risk. For further details on the Group's defined benefit pension obligations and their management, please refer to Note 33 "Employee Benefits" in the "Notes to the Consolidated Financial Statements" section.

Other risks in the Banking Book

Market risks in the Asset Management business primarily result from principal guaranteed funds or accounts, but also from co-investments in the bank's funds.

Non-trading Market Risk Economic Capital

Non-trading market risk economic capital is calculated either by applying the standard traded market risk EC methodology or through the use of non-traded market risk models that are specific to each risk class and which consider, among other factors, historically observed market moves, the liquidity of each asset class, and changes in client's behavior in relation to products with behavioral optionalities.

Operational risk management

Operational Risk Management Framework

Deutsche Bank applies the European Banking Authority's Single Rulebook definition of operational risk: "Operational risk means the risk of losses stemming from inadequate or failed internal processes, people and systems or from external events. Operational risk includes legal risks but excludes business and reputational risk and is embedded in all banking products and activities." Operational risk forms a subset of the bank's non-financial risks.

Deutsche Bank's operational risk appetite sets out the amount of operational risk it is willing to accept as a consequence of doing business. The bank takes on operational risks consciously, both strategically as well as in day-to-day business. While the bank may have no appetite for certain types of operational risk events (such as violations of laws or regulations and misconduct), in other cases a certain amount of operational risk must be accepted if the bank is to achieve its business objectives. In case a residual risk is assessed to be outside risk appetite, risk reducing actions must be undertaken, including remediating the risks, insuring risks or ceasing business.

The Operational Risk Management Framework is a set of interrelated tools and processes that are used to identify, assess, measure, monitor and mitigate the bank's operational risks. Its components have been designed to operate together to provide a comprehensive, risk-based approach to managing the bank's most material operational risks. Operational Risk Management Framework components include the Group's approach to setting and adhering to operational risk appetite, the operational risk type and control taxonomies, the minimum standards for operational risk management processes including the respective tools, and the bank's operational risk capital model.

Organizational & governance structure

While the day-to-day management of operational risk is the primary responsibility of business divisions and infrastructure functions, where these risks are generated, Non-Financial Risk Management (NFRM) oversees the Group-wide management of operational risks, identifies and reports risk concentrations, and promotes a consistent application of the Operational Risk Management Framework across the bank. NFRM is part of the Group risk function, the Chief Risk Office, which is headed by the Chief Risk Officer.

The Chief Risk Officer appoints the Head of NFRM, who is accountable for the design, oversight and maintenance of an effective, efficient and regulatory compliant Operational Risk Management Framework, including the operational risk capital model. The Head of NFRM monitors and challenges the Operational Risk Management Framework's Group wide implementation and monitors overall risk levels against the bank's operational risk appetite.

The Non-Financial Risk Committee, which is chaired by the Chief Risk Officer, is responsible for the oversight, governance and coordination of the management of operational risk in the Group on behalf of the Management Board, by establishing a cross-risk perspective of the key operational risks of the Group. Its decision-making authorities include the review, advice and management of all operational risk issues that may impact the risk profile of business divisions and infrastructure functions. Several sub-fora with attendees from both the 1st LoD and 2nd LoD support the Non-Financial Risk Committee to effectively fulfil its mandate. In addition to the Group level Non-Financial Risk Committee, business divisions have established 1st LoD non-financial risk fora for the oversight and management of operational risks on various levels of the organization.

The governance of operational risks follows the bank's 3LoD approach to managing all of its financial and non-financial risks. The Operational Risk Management Framework establishes the operational risk governance standards including the core 1st and 2nd LoD roles and their responsibilities, to ensure effective risk management and appropriate independent challenge.

Operational risk requirements for the 1st LoD: Risk owners as the 1st LoD have full accountability for their operational risks and manage these against a defined risk appetite.

Risk owners are those roles in the bank whose activities generate - or who are exposed to - operational risks. As heads of business divisions and infrastructure functions, they must determine the appropriate organizational structure to identify their operational risk profile, actively manage these risks within their organization, take business decisions on the mitigation or acceptance of operational risks to ensure they remain within risk appetite, and establish and maintain 1st LoD controls.

Operational risk requirements for the 2nd LoD: Risk Type Controllers act as the 2nd LoD control functions for all sub-risk types under the overarching risk type "operational risk".

Risk Type Controllers establish the framework and define Group level risk appetite statements for the specific operational risk type they oversee. Risk Type Controllers define the minimum risk management and control standards and independently monitor and challenge risk owners' implementation of these standards in their day-to-day processes, as well as their risk-taking and risk management activities. Risk Type Controllers provide independent operational risk oversight and prepare aggregated risk type profile reporting. Risk Type Controllers monitor the risk type's profile against risk appetite and have a right to veto risk decisions leading to foreseeable risk appetite breaches. As risk type experts, Risk Type Controllers define the risk type and its taxonomy and support and facilitate the implementation of the risk type framework in the 1st LoD. To maintain their independence, Risk Type Controller roles are located only in infrastructure functions.

Operational risk requirements for NFRM as the Risk Type Controller for the overarching risk type "operational risk": As the Risk Type Controller / risk control function for operational risk, NFRM establishes and maintains the overarching Operational Risk Management Framework and determines the appropriate level of capital to underpin the Group's operational risk.

- As the 2nd LoD risk control function, NFRM defines the bank's approach to operational risk appetite and monitors its adherence, breaches and consequences; NFRM is the independent reviewer and challenger of the 1st LoD's risk and control assessments and risk management activities relating to the holistic operational risk profile of a unit (while Risk Type Controllers monitor and challenge activities related to their specific risk types); NFRM provides the oversight of risk and control mitigation plans to return the bank's operational risk to its risk appetite, where required; it also establishes and regularly reports the bank's operational risk profile and operational top risks, i.e. the bank's material operational risks which are outside of risk appetite
- As the subject matter expert for operational risk, NFRM provides independent risk views to facilitate forward-looking management of operational risks, actively engages with risk owners (1st LoD) and facilitates the implementation of risk management and control standards across the bank
- NFRM is accountable for the design, implementation and maintenance of the approach to determine the adequate level of capital required for operational risk, for recommendation to the Management Board; this includes the calculation and allocation of operational risk capital demand and expected loss under the Advanced Measurement Approach (AMA)

Managing operational risk

To manage the broad range of sub-risk types underlying operational risk, the Operational Risk Management Framework provides a set of tools and processes that apply to all operational risk types across the bank. These enable the bank to determine its operational risk profile in relation to risk appetite for operational risk, to systematically identify operational risk themes and concentrations, and to define risk mitigating measures and priorities.

In 2022, the bank continued to mature the management of operational risks by further integrating and simplifying the risk management processes, by enhancing the bank's central controls inventory, by upgrading systems to capture and analyze operational risk loss events, by enhancing governance around risk appetite, and by strengthening control activities conducted by both 1st LoD and 2nd LoD functions at various levels across the bank.

Loss data collection: Data on internal and relevant external operational risk events (with a P&L impact \geq €10,000) is independently validated in a timely manner. Material operational risk events trigger clearly defined lessons learned and read-across analyses, which are performed in the 1st LoD in close collaboration between business partners, risk control and other infrastructure functions. Lessons learned reviews analyze the reasons for significant operational risk events, identify their root causes, and document appropriate remediation actions to reduce the likelihood of their reoccurrence. Read across reviews take the conclusions of the lessons learned process and seek to analyze whether similar risks and control weaknesses identified in a lessons learned review exist in other areas of the bank, even if they have not yet resulted in problems. This allows preventative actions to be undertaken. In 2022, the bank implemented a new system (Event Management Application 'EMApp') for capturing and managing operational risk events to replace dbIRS. The historical data on loss events has been migrated from dbIRS to EMApp, and its completeness and potential impacts on the operational risk model were tested and documented.

Scenario analysis: The operational risk profile is complemented by incorporating exploratory scenario analysis into day-to-day risk management activities. Scenario analysis is used as a risk identification and management tool that enables risk owners and Risk Type Controllers to explore potential exposure to risk as the basis for identifying potential gaps in the banks existing operational risk profile. Scenario storylines build on internal losses, emerging risk reviews, top risk concentrations, and the review of external peer operational risk loss events. Information from actual and potential future loss events are systematically utilized to identify thematic susceptibilities and actively seek to reduce the likelihood of similar incidents, for example through deep dive analyses or risk profile reviews. In 2022, the scenario analysis process has been strengthened by further tightening the roles and responsibilities within the 1st LoD and 2nd LoD in executing scenarios. Furthermore, scenario analysis continues to play an important role in operational resilience exercises particularly in assessing impacts on emerging risk themes such as the Ukraine/Russia conflict, energy shortage etc., to assist the bank to prepare for crisis management decisions.

Risk & Control Assessment: The risk and control assessment process comprises of a series of bottom-up assessments of the risks generated by business divisions and infrastructure functions (1st LoDs), the effectiveness of the controls in place to manage them, and the remediation actions required to bring the risks outside of risk appetite back into risk appetite. This enables both the 1st and 2nd LoDs to have a clear view of the bank's material operational risks. In 2022, the bank continued to embed the dynamic, trigger-based approach to the risk and control assessment to review the bank's risk profile on a real time basis through non-financial risk governance meetings. In addition, the bank has continued to mature its central control inventory as well as assurance and assessment activities to provide greater transparency to the risk owners on the effectiveness of the control environments mitigating their risks.

Top risks: The bank regularly reports and performs analyses on top risks to establish that they are appropriately mitigated. As all risks, top risks are rated in terms of both the likelihood that they could occur and the impact on the bank should they do so, and through this assessment they are identified to be particularly material for the bank. The reporting provides a forward-looking perspective on the impact of planned remediation and control enhancements. It also contains emerging risks and themes that have the potential to evolve as top risks in the future. Top risk reduction programs comprise the most significant risk reduction activities that are key to bringing operational top risk themes back within risk appetite. In 2022, the frequency of Group top risk reporting was changed from monthly to quarterly to align with divisional top risk reporting cadence, noting that any risk and remediation updates may be reflected dynamically via the risk and control assessment process.

Transformation Risk Assessment: To appropriately identify and manage risks from material change initiatives within the bank, a transformation risk assessment process is in place to assess the impact of transformations on the bank's risk profile and control environment. This process considers impacts to both financial and non-financial risk types and is applicable to initiatives including regulatory initiatives, technology migrations, risk remediation projects, strategy changes, organizational changes, and real estate moves within the bank. In 2022, a number of changes were introduced in order to improve the robustness of the assessment. To that end, the timeframe to finalize the assessment has been extended, the template has been enhanced, and the role of 2nd LoD functions to challenge and input into the assessment was further strengthened.

Risk appetite: Non-financial risk appetite is the amount of non-financial risk the bank is willing to accept as a consequence of doing business. The non-financial risk appetite framework provides a common approach to measure and monitor the level of risk appetite across the firm. NFR appetite metrics are used to monitor the operational risk profile against the bank's defined risk appetite, and to alert the organization to impending problems in a timely fashion. In 2022, the design of an enhanced risk appetite framework was developed and tested for a subset of risk types. Further refinements to the approach and a fuller implementation plan will be a focus for 2023.

Findings and issue management: The findings and issue management process facilitates the bank in mitigating the risks associated with known control weaknesses and deficiencies, and enables management to make risk-based decisions over the need for further remediation or risk acceptance. Outputs from the findings management process must be able to demonstrate to internal and external stakeholders that the bank is actively identifying its control weaknesses and taking steps to manage associated risks within acceptable levels of risk appetite.

Operational risk type frameworks

Operational risk is a risk type on the Group's Risk Type Taxonomy. Together with Reputational Risk it forms Non-Financial risk. The Operational Risk Management Framework is a set of interrelated tools and processes that are used to identify, assess, measure, monitor and mitigate Deutsche Bank Group's operational risks according to regulatory and industry-established definition of operational risk. It applies to the operational sub-risk types on a more granular level and enables the bank to aggregate and monitor its operational risk profile. These operational sub-risk types are controlled by various infrastructure functions and include the following:

- The Compliance department performs an independent 2nd level control function that protects the bank's license to operate by promoting and enforcing compliance with the law and driving a culture of compliance and ethical conduct in the bank; the Compliance department assists and challenges the business divisions and works with other infrastructure functions and regulators to establish and maintain a risk-based approach to the management of the bank's compliance risks in accordance with the bank's risk appetite and to help the bank detect, mitigate and prevent breaches of laws and regulations; the Compliance department performs the following principal activities: the identification, assessment, mitigation, monitoring and reporting on compliance risk; performs second level controls; the results of these assessments and controls are regularly reported to the Management Board and Supervisory Board. The Compliance department also assists the Regulatory Management team with regulatory engagement
- Financial crime risks are managed by the Anti-Financial Crime (AFC) function via maintenance and development of a dedicated program; the AFC program is based on regulatory and supervisory requirements; AFC has defined roles and responsibilities and established dedicated functions for the identification and management of financial crime risks resulting from money laundering, terrorism financing, compliance with sanctions and embargoes, the facilitation of tax evasion as well as other criminal activities including fraud, bribery and corruption and other crimes; AFC updates its strategy for financial crime prevention via regular development of internal policies processes and controls, institution-specific risk assessment and staff training
- The Legal department (including Group Governance and Group Data Privacy) is an independent infrastructure function mandated to provide legal advice to the Management Board, the Supervisory Board (to the extent it does not give rise to conflict of interest), business divisions and infrastructure functions, and to support the Management Board in setting up and guarding the Group's governance and control frameworks in respect of the bank's legal, internal corporate governance and data privacy risks; this includes in particular, but is not limited to:
 - Advising the Management Board and Supervisory Board on legal aspects of their activities
 - Providing legal advice to all Deutsche Bank units to facilitate adherence to legal and regulatory requirements in relation to their activities respectively, including to support their interactions with regulatory authorities
 - Engaging and managing external lawyers used by Deutsche Bank Group
 - Managing Deutsche Bank Group's litigation and contentious regulatory matters, (including contentious HR matters), and managing Deutsche Bank Group's response to external regulatory enforcement investigations
 - Advising on legal aspects of internal investigations
 - Setting the global governance framework for Deutsche Bank Group, facilitating its cross-unit application and assessing its implementation
 - Developing and safeguarding efficient corporate governance structures suitable to support efficient decision-making, to align risk and accountability based on clear and consistent roles and responsibilities
 - Maintaining Deutsche Bank Group's framework for policies, procedures and framework documents and acting as guardian for Group policies and procedures as well as framework documents
 - Advising on data privacy laws, rules and regulation and maintaining Deutsche Bank Group's data privacy risk and control framework
 - Ensuring appropriate quality assurance in relation to all of the above
- NFRM Product Governance oversees Product Lifecycle risk and manages the New Product Approval (NPA) and Systematic Product Review (SPR) cross-risk processes. These processes are central to the control framework designed to manage risks associated with the implementation of new products and services, and changes in products and services during their lifecycles. Applicable bank-wide, the cross-risk processes cover different stages of the product lifecycle with NPA focusing on pre-implementation and Systematic Product Review on post-implementation; pre-implementation, the primary objective of the NPA process is to ensure proper assessment of all risks, both financial and non-financial, in NPA relevant products and services, as well as related processes and infrastructure; post-implementation, the Systematic Product Review process focuses on the periodic review of all products to determine if they are to remain live or need to be modified or withdrawn. In 2022, NFRM Product Governance has continued to develop its Future State operating model, an ongoing multi-year program to improve the risk management of new products. NFRM Product Governance also continues to monitor emerging risks, such as ESG, to ensure their appropriate consideration.

- NFRM is the Risk Type Controller for a number of operational resilience risks; its mandate includes second line oversight of controls over transaction processing activities, as well as infrastructure risks to prevent technology or process disruption, maintain the confidentiality, integrity and availability of data, records and information security, and ensure business divisions and infrastructure functions have robust plans in place to recover critical business processes and functions in the event of disruption including technical or building outage, or the effects of cyber-attack or natural disaster as well as any physical security or safety risk; NFRM Risk Type Controller also manages the risks arising from the bank's internal and external vendor engagements via the provision of a comprehensive third party risk management framework

Measuring Operational Risks

Deutsche Bank calculates and measures the regulatory and economic capital requirements for operational risk using the AMA methodology. The AMA capital calculation is based upon the loss distribution approach. Gross losses from historical internal and external loss data (Operational Riskdata eXchange Association consortium data) complemented by scenario data are used to estimate the risk profile (i.e., a loss frequency and a loss severity distribution). The loss distribution approach model includes conservatism by recognizing losses on events that arise over multiple years as single events in the historical loss profile.

Within the loss distribution approach model, the frequency and severity distributions are combined in a Monte Carlo simulation to generate potential losses over a one-year time horizon. Finally, the risk mitigating benefits of insurance are applied to each loss generated in the Monte Carlo simulation. Correlation and diversification benefits are applied to the net losses in a manner compatible with regulatory requirements to arrive at a net loss distribution at Group level, covering expected and unexpected losses. Capital is then allocated to each of the business divisions considering qualitative adjustments after deducting expected loss.

The regulatory and economic capital requirements for operational risk is derived from the 99.9% percentile; see the section "Internal Capital Adequacy" for details. Both regulatory and economic capital requirements are calculated for a time horizon of one year.

The regulatory and economic capital demand calculations are performed on a quarterly basis. NFRM establishes and maintains the approach for capital demand quantification and ensures that appropriate development, validation and change governance processes are in place, whereby the validation is performed by an independent validation function and in line with the Group's model risk management process.

Drivers for operational risk capital development

As of December 31, 2022, operational losses for the Group were € 528 million. Losses from "Clients, Products and Business Practices" and "Others" contributed to 80% of operational risk regulatory and economic capital demand.

In view of the relevance of legal risks within the bank's operational risk profile, specific attention is dedicated to the management and measurement of open civil litigation and regulatory enforcement matters where the bank relies both on information from internal as well as external data sources to consider developments in legal matters that affect the bank specifically but also the banking industry as a whole. Reflecting the multi-year nature of legal proceedings the measurement of these risks furthermore takes into account changing levels of certainty by capturing the risks at various stages throughout the lifecycle of a legal matter.

Conceptually, the bank measures operational risk including legal risk by determining the annual operational risk loss that will not be exceeded with a given probability. This loss amount is driven by a component that due to the IFRS criteria is reflected in the bank's financial statements and a component beyond the amount reflected as provisions within the bank's financial statements.

The legal losses which the bank expects with a likelihood of more than 50% are already reflected in the IFRS group financial statements. These losses include net changes in provisions for existing and new cases in a specific period where the loss is deemed probable and is reliably measurable in accordance with IAS 37.

Uncertain legal losses which are not reflected in the bank's financial statements as provisions because they do not meet the recognition criteria under IAS 37 are considered within "regulatory or economic capital demand".

To quantify the litigation losses in the AMA model, the bank takes into account historical losses, provisions, contingent liabilities and legal forecasts. Legal forecasts generally comprise ranges of potential losses from legal matters that are not deemed probable but are reasonably possible. Reasonably possible losses may result from ongoing and new legal matters which are reviewed at least quarterly by the attorneys handling the legal matters.

The legal forecasts are included in the “relevant loss data” used in the AMA model. The projection range of the legal forecasts is not restricted to the one year capital time horizon but goes beyond and conservatively assumes early settlement of the underlying losses in the reporting period - thus considering the multi-year nature of legal matters.

Liquidity risk management

Liquidity risk arises from DB Group's potential inability to meet payment obligations when they come due or without incurring excessive costs. The Group's liquidity risk management framework ensures that all necessary guidance and controls are established within the Group to fulfil its payment obligations at all times (including intraday) and to manage its liquidity and funding risks within the MB approved risk appetite, when executing the strategic plan. The framework considers relevant and significant drivers of liquidity risk, whether on-balance sheet or off-balance sheet.

Liquidity risk management framework

The Group's liquidity risk management principles are documented in the global Liquidity Risk Management Policy” (LRMP) and the framework is described in the Liquidity Risk Management Framework” document. They adhere to the eight key risk management practices, namely risk governance, risk organization (3 LoD), risk culture, risk appetite and -strategy, risk identification and -assessment, risk mitigation and controls, risk measurement and reporting, stress planning and -execution. All additional policies and procedures (both global and local) issued by the liquidity risk management functions further define the requirements specific to liquidity risk practices. They are subordinate to the LRMP and are subject to the standards the LRMP sets forth. The liquidity managing functions are organized in alignment with the three lines of defense structure, which is described in the Risk Management Policy”. The lines of business and Treasury comprise the 1LoD is responsible for executing the steps needed to manage the bank's liquidity position. Risk comprises the 2LoD, responsible for providing independent risk oversight, challenge, and validation of activities conducted by the 1LoD including establishing the risk appetite and Group level control standards. Group Audit comprises the 3LoD, responsible for overseeing the activities of both the 1LoD and 2LoD. The individual roles and responsibilities within the liquidity risk management framework are laid out and documented in the global responsibility matrix, which provides further clarity and transparency across all involved stakeholders.

In accordance with the ECB's SREP (and revised ILAAP requirement issued in November 2018), the Group has implemented an Internal Liquidity Adequacy Assessment Process (ILAAP), which is reviewed at least annually and approved by the MB. Liquidity Risk Management undertakes ongoing oversight on activities conducted within the mandate of Treasury Liquidity Management to most effectively manage the liquidity of the Group and steer business activities, while ensuring the bank's risk appetite is adhered to. The Internal Liquidity Adequacy Assessment Process provides comprehensive documentation and assessment of the bank's liquidity risk management framework, which includes the identification of key liquidity and funding risks to which the Group is exposed; describing how these risks are identified, monitored and measured; and describing the techniques and resources used to manage and mitigate these risks.

The MB defines the liquidity and funding risk strategy for the Group as well as the risk appetite, based on recommendations made by the Group Asset and Liability Committee (ALCO) and Group Risk Committee. The MB reviews and approves the risk appetite at least annually. The risk appetite is applied to the Group and its key liquidity entities e.g., DB AG to monitor and control liquidity risk as well as the Group's long-term funding and issuance plan.

The Group's liquidity risk appetite, which is defined through qualitative principles and supporting quantitative metrics, is laid out in the Risk Appetite Statement” and is subject to the standards defined in the Risk Appetite Policy”. This Risk Appetite Statement is further underpinned by the liquidity risk controls framework consisting of risk appetite limits, as well as a suite of non-risk appetite limits, thresholds and early warning indicators, which are defined in the Liquidity Risk Controls Policy”.

Deutsche Bank implemented a dedicated stress testing and risk appetite Framework defined by Liquidity Risk Management, which ensures its liquidity position is balanced across the Group, its KLEs and across currencies.

Treasury manages liquidity and funding, in accordance with the MB-approved risk appetite across a range of relevant metrics and implements several tools including business level limits, to ensure compliance. As such, Treasury works closely with Liquidity Risk Management and the business divisions to identify, analyze and monitor underlying liquidity risk characteristics within business portfolios. These parties are engaged in regular dialogue regarding changes in the Group's liquidity position arising from business activities and market circumstances.

Furthermore, the Group ensures at the level of each liquidity relevant entity that all local liquidity metrics are managed in compliance with the defined risk appetite. Local liquidity surpluses are pooled in DB AG hubs and local liquidity shortfalls can be met through support from DB AG hubs. Transfers of liquidity capacity between entities are subject to the approval framework outlined in the Intercompany Funding Policy” involving the Group’s liquidity steering function as well as the local liquidity managers considering the compliance of metrics like LCR, NSFR (Pillar 1) and sNLP (Pillar 2). Available surplus that resides in entities with restriction to transfer liquidity to other Group entities, for example due to regulatory lending requirements, is treated as trapped and as such not considered in the calculation of the consolidated group liquidity surplus.

The MB is informed about the Group’s performance against the key liquidity metrics, including the risk appetite and internal and market indicators, via a weekly liquidity dashboard. Liquidity & Treasury Reporting & Analysis (LTRA) has overall accountability for the accurate and timely production of both external regulatory liquidity reporting (Pillar 1) as well as internal management reporting (Pillar 2) for liquidity risk of the Group. In addition, LTRA is responsible for the development of management information systems and the related analysis to support the liquidity risk framework and its governance for Treasury and LRM.

As part of the annual strategic planning process, Treasury projects the development of the key liquidity and funding metrics including the USD currency exposure based on anticipated business activities to ensure that the strategic plan can be executed in accordance with the Group’s risk appetite.

Deutsche Bank has a wide range of funding sources, including retail and institutional deposits, unsecured and secured wholesale funding, as well as debt issuance in the capital markets. Group ALCo is the Group’s decisive governing body mandated by the MB to optimize the sourcing and deployment of the Group’s balance sheet and financial resources in line with the MB’s risk appetite and strategy. The Group ALCo has the overarching responsibility to define, approve and optimize the Group’s funding strategy.

Deutsche Bank’s Group Contingency Funding Plan outlines, how the Group would respond to an actual or anticipated liquidity stress event. It includes a decisive set of actions that can be taken to raise cash and recover the Group’s key liquidity metrics in times of liquidity stress. The Contingency Funding Plan includes a clear governance structure and well-defined liquidity risk indicators to ensure timely escalation and effective decision-making, communication, and coordination during a liquidity stress event. Deutsche Bank has established the Financial Resource Management Council, which is responsible for oversight of capital and liquidity across contingency, recovery, and resolution scenarios in a defined crisis situation.

Short-term liquidity and wholesale funding

The Group tracks all contractual cash flows from wholesale funding sources on a daily basis, over a twelve-month horizon. For this purpose, the Group considers wholesale funding to include unsecured liabilities largely raised by Treasury Markets Pool, as well as secured liabilities primarily raised by the Investment Bank division. Wholesale funding counterparties typically include corporates, banks and other financial institutions, governments, and sovereigns.

The Group has implemented a set of limits and thresholds to restrict its exposure to wholesale counterparties, which have historically demonstrated the most susceptibility to market stress. Wholesale funding limits are monitored daily and apply to the total outstanding volume of wholesale funding across all currencies, for both secured and unsecured funding with specific tenor limits. Liquidity reserves constitute the primary mitigant against potential stress in the short-term.

The tables in the section Liquidity Risk Exposure: Funding Diversification” show the contractual maturity of the Group’s short-term wholesale funding and capital markets issuance.

Liquidity stress testing and scenario analysis

Global internal liquidity stress testing and scenario analysis is used for measuring liquidity risk and evaluating the Group’s short-term liquidity position within the liquidity framework. This complements the daily operational cash management process. The long-term liquidity strategy based on contractual and behavioral modelled cash flow information is represented by a long-term metric known as the Funding Matrix (refer to Funding Risk Management below).

The global liquidity stress testing process is managed by Treasury in accordance with the MB approved risk appetite. Treasury is responsible for the design of the overall methodology, the choice of liquidity risk drivers and the determination of appropriate assumptions (parameters) to translate input data into stress testing output. Liquidity Risk Management is responsible for the definition of the stress scenarios. Under the principles and policy requirements laid out by Model Risk Management, Liquidity Risk Management and Model Risk Management perform the independent validation of liquidity risk models and non-model estimates. LTRA is responsible for implementing these methodologies and performing the stress test calculation in conjunction with Treasury, Liquidity Risk Management and IT.

Stress testing and scenario analysis are used to describe and evaluate the impact of sudden and severe stress events on the Group's liquidity position. Deutsche Bank has selected four scenarios to calculate the Group's stressed Net Liquidity Position (sNLP[®]). These scenarios are designed to capture potential outcomes which may be experienced by the Group. The most severe scenario assesses the potential consequences of a combined market-wide and idiosyncratic stress event, including downgrades of our credit rating. Under each of the scenarios, the impact of a liquidity stress event over different time horizons and across multiple liquidity risk drivers, covering all business lines and product areas is considered. The output from this scenario analysis feeds the Group Wide Stress Test, which considers the impact of scenarios across all risk stripes.

In addition, potential funding requirements from contingent liquidity risks which can arise under stress, including drawdowns on facilities, increased collateral requirements under derivative agreements, and outflows from deposits with a contractual rating linked trigger are included in the analysis. Subsequently, countermeasures, which are the actions the Group would take to counterbalance the outflows incurred during a stress event, are taken into consideration. Those countermeasures include the usage of the Group's Liquidity Reserve and generating liquidity from other unencumbered, marketable assets without causing any material impact on the Group's business model.

Stress testing is conducted at a global level and for defined entities relevant for liquidity risk management. The stress analysis covers an eight-week stress horizon which is considered to be the most critical time span during a liquidity crisis requiring that liquidity is actively assessed and steered on a Group level. In addition to the consolidated currency stress test, further stress tests are performed for material currencies (EUR, USD and GBP). On a global level and in the U.S. liquidity stress tests a twelve-months period is covered. Additionally, stress test results are monitored over a twelve-month period with specific risk limits, if required by local regulators. Ad-hoc analysis may be conducted to reflect the impact of potential downside events that could affect the Group such as climate / ESG-related events. Relevant stress assumptions are applied to reflect liquidity flows from risk drivers and on-balance sheet and off-balance sheet products. The suite of stress testing scenarios and assumptions are reviewed on a regular basis and are updated when enhancements are made to stress testing methodologies.

Complementing the daily liquidity stress testing, the Group also conducts regular group-wide stress tests run by Enterprise Risk Management, which analyze liquidity risks in conjunction with the other defined risk types and evaluate their impact and interplay to both capital and liquidity positions as described in Risk and Capital Framework Stress testing.

The tables in the section "Liquidity Risk Exposure: Stress Testing and Scenario Analysis" show the results of the internal global liquidity stress test under the various scenarios.

Liquidity Coverage Ratio

In addition to the internal stress test results, the Group implemented a MB-approved risk appetite for its Liquidity Coverage Ratio (LCR). The LCR is intended to promote the short-term resilience of a bank's liquidity risk profile over a 30-day stress scenario. The ratio is defined as the amount of High-Quality Liquid Assets (HQLA) that could be used to raise liquidity in a stressed scenario, measured against the total volume of net cash outflows, arising from both contractual and modelled exposures over a 30-day time horizon.

The LCR complements the internal stress testing framework. By maintaining a ratio in excess of the minimum regulatory requirements, the LCR seeks to ensure that the Group holds adequate liquidity resources to mitigate a short-term liquidity stress.

Key differences between the internal liquidity stress test and the LCR include the time horizon (eight weeks versus 30 days), the classification and haircut differences between Liquidity Reserves and the LCR HQLA, outflow rates for various categories of funding, as well as inflow assumption for various assets (for example, loan repayments). The Group's internal liquidity stress test also includes outflows related to intraday liquidity assumptions, which are not explicitly reflected in the LCR.

Funding Risk Management and Funding Diversification

In line with regulatory guidelines, Deutsche Bank has developed a set of internal indicators to measure its inherent funding risks. These are considered for steering purposes in addition to the regulatory metric Net Stable Funding Ratio (NSFR).

The Group's primary internal tool for monitoring and managing structural funding risk is the Funding Matrix. The Funding Matrix assesses the Group's structural funding profile over a time horizon beyond one year. To produce the Funding Matrix, all funding-relevant assets and liabilities are mapped into time buckets corresponding to their contractual or modeled maturities. This allows the Group to identify expected excesses and shortfalls in term liabilities over assets in each time bucket, facilitating the management of potential liquidity exposures.

The liquidity profile is based on contractual cash flow information. If the contractual maturity profile of a product does not adequately reflect the liquidity profile, it is replaced by modeling assumptions. Short-term balance sheet items (<1yr) or matched funded structures (asset and liabilities directly matched with no liquidity risk) are excluded from the term analysis.

The bottom-up assessment by individual business line is combined with a top-down reconciliation against the Group's IFRS balance sheet. From the cumulative term profile of assets and liabilities beyond 1 year, long-funded surpluses or short-funded gaps in the Group's maturity structure can be identified. The cumulative profile is thereby built up starting from the greater than ten-year" bucket down to the greater than one-year" bucket. The Funding Matrix is also undertaken for material foreign currencies (USD and GBP).

The Group relies on a vast range of funding sources. These protect its liquidity position twofold. Firstly, since stress events may impact funding markets differently, maintaining a well-diversified funding portfolio will lower the average impact for the Group. Secondly, when experiencing liquidity stress, having access to a wide range of funding sources significantly improves the Group's ability to tap different funding markets. The diversification across products is complemented by explicit thresholds for selected, less stable products. Additionally, insufficient counterparty diversification can adversely impact the stability of the Group's liquidity and funding position, in particular when those funds have a shorter duration. As such, Treasury monitors the development of the Group's top funding counterparties.

The stability of DB Group's funding position can be negatively impacted by various forms of industry risks. These are typically medium to long term structural trends with potentially significant long-term impact on the economy and consequently on banks' balance sheets. DB is performing ad-hoc analyses on such emerging risks to assess the impact of such trends on its funding position to ensure that mitigating measures will be taken well in time when deemed necessary. In addition, Treasury evaluates current market access information in its significant funding markets on a regular basis. Market access information is compiled quarterly and presented to Group ALCo.

To diversify our refinancing activities, Deutsche Bank holds a license to issue mortgage Pfandbriefe and maintains a program to issue structured covered bonds. Additionally, the Group continues to run a program for the purpose of issuing covered bonds under Spanish law (Cedulas). The Group has also participated in ECB's TLTRO III program. Additionally, the Group expanded its potential investor base through the introduction of its Green Bond framework in 2020. Following the inaugural green issuances in 2020, the Group has continuously expanded its Green Bond issuance activity. Furthermore, multiple green structured notes, first green deposits and first green repurchase agreements (repos) were executed. Various teams within DB continue to work on expanding the Group's green footprint on the asset as well the liability side.

The chart Liquidity Risk Exposure: Funding Diversification" shows the composition of external funding sources that contribute to the liquidity risk position, both in EUR billion and as a percentage of our total external funding sources.

Net Stable Funding Ratio

The Net Stable Funding Ratio (NSFR) is a regulatory metric for assessing a Bank's structural funding profile. The NSFR is intended to reduce medium to long-term funding risks by requiring banks to maintain a stable funding profile in relation to their on- and off-balance sheet activities. The ratio is defined as the amount of Available Stable Funding (the portion of capital and liabilities expected to be a stable source of funding), relative to the amount of Required Stable Funding (a function of the liquidity characteristics of various assets held).

A NSFR risk appetite has been set for Group as well as for the entity DB AG to ensure compliance with this regulatory requirement.

Capital Markets Issuance

Debt issuance, encompassing senior unsecured bonds, covered bonds, and capital securities, is a key source of term funding for the Group and is managed directly by Treasury. At least once a year, following endorsement by ALCO, Treasury submits an annual long-term funding plan to the GRC for recommendation and then to MB for approval. This plan is driven by global and local funding and liquidity requirements based on expected business development. The Group's capital markets issuance portfolio is dynamically managed through annual issuance plans to avoid excessive maturity concentrations.

Funds Transfer Pricing

The funds transfer pricing framework applies to all businesses and regions and promotes pricing of (i) assets in accordance with their underlying liquidity risk, (ii) liabilities in accordance with their liquidity value and (iii) contingent liquidity exposures in accordance with the cost of providing for appropriate Liquidity Reserves.

Within this framework funding and liquidity risk costs and benefits are allocated to the Group's business units based on rates which reflect the economic costs of liquidity for Deutsche Bank. Treasury might set further financial incentives in line with the Group's liquidity risk guidelines. While the framework promotes a diligent Group-wide allocation of its funding costs to the liquidity users, it also provides an incentive-based framework for businesses generating stable long-term and stress compliant funding.

Throughout 2022, the Bank continued to deliver against improvements of the changes to the internal FTP framework started in 2019 aimed at enhancing its effectiveness as a management tool, as well as better supporting funding cost optimization. Additional details are included in Note 4 Business segments and related information of the consolidated financial statements.

Liquidity Reserves

Liquidity Reserves comprise available cash and cash equivalents, unencumbered highly liquid securities (including government and agency bonds and government guarantees) and other unencumbered central bank eligible assets. Certain intraday requirements and mandatory minimum reserves are directly deducted in the calculation of the Liquidity Reserves while other intraday outflows are represented in the Group's internal liquidity model.

The vast majority of the Group's liquidity reserves are held centrally across major currencies at the central bank accounts of the parent entity and foreign branches in the key locations in which we are active and in a dedicated Treasury-owned Strategic Liquidity Reserve (SLR), set up exclusively to serve as a mitigant during periods of stress. To ensure a prudent composition of liquidity reserves across asset classes, minimum cash thresholds for the material currencies are maintained. In-line with our communication to the market, going forward the Bank aims at focusing on its amount of High-quality Liquid Assets, replacing the Liquidity Reserve measure, as it provides greater comparability across the industry.

Asset Encumbrance

Encumbered assets primarily comprise those on- and off-balance sheet assets that are pledged as collateral against secured funding, collateral swaps, and other collateralized obligations. Generally, loans are encumbered to support long-term capital markets secured issuance such as covered bonds or other self-securitization structures, while financing debt and equity inventory on a secured basis is a regular activity for the Investment Bank business. Additionally, in line with the EBA technical standards on regulatory asset encumbrance reporting, assets pledged with settlement systems are considered encumbered assets, including default funds and initial margins, as well as other assets pledged which cannot be freely withdrawn such as mandatory minimum reserves at central banks. Derivative margin receivable assets as encumbered under these EBA guidelines are also included.

Enterprise risk management

Enterprise Risk Management (ERM) is a cross-risk function that drives active portfolio management across all businesses and geographies, including management of risk appetite for industry, country and credit risk. Key responsibilities include:

- Delivering insight through emerging risks and trends analysis, forward-looking stress tests, portfolio concentration, deep-dive analyses and ad-hoc event reporting.
- Overseeing the Bank's internal capital adequacy process, including capital risk appetite.
- Coordinating and implementing the group recovery plan.
- Developing and managing the climate risk management framework.
- Providing risk reporting and analytics to key stakeholders, including senior management and regulators.
- Acting as risk controlling function for credit risk.

Strategic risk

Strategic risk is the risk of a shortfall in earnings (excluding other material risks) due to incorrect business plans (owing to flawed assumptions), ineffective plan execution or a lack of responsiveness to material plan deviations. Strategic risk arises from the exposure of the bank to the macroeconomic environment, changes in the competitive landscape, and regulatory and technological developments. Additionally, it could occur due to errors in strategic positioning, the bank's failure to execute its planned strategy and/or a failure to effectively address underperformance versus plan targets.

The strategic plan is developed annually and presented to the Management Board for discussion and approval. The final plan is presented to the Supervisory Board. The plan is challenged in an iterative process with respect to its assumptions, credibility and integrity. During the year, execution of business strategies is regularly monitored to assess the performance against targets. A more comprehensive description of this process is detailed in the section 'Strategic and Capital Plan'.

Strategic risk is measured through a dedicated risk model that quantifies potential losses caused by unexpected pre-tax earnings shortfalls that cannot be offset by cost reductions under extreme but plausible market conditions over a 12-month period.

The 2nd LoD for strategic risk is the Risk Governance & Strategy function. Finance, together with the divisions, is the 1st LoD and acts as key risk managers of the associated risk.

Capital risk

Capital risk is defined as the risk that Deutsche Bank has an insufficient level or composition of capital supply to support its current and planned business activities and associated risks during normal and stressed conditions.

The bank's capital risk framework consists of several elements which aim to ensure that Deutsche Bank maintains on an ongoing basis an adequate capitalization to cover the risks to which is exposed. The framework is strongly integrated with the bank-wide strategic planning process and closely linked to Deutsche Bank's internal capital adequacy assessment process (see section "Internal Capital Adequacy Assessment Process" for further details). Treasury together with the divisions is the key risk manager of the associated risks and represents the 1st LoD. ERM acts as the 2nd LoD for capital risk.

Treasury function manages capital risk at group level and locally in each region, as applicable. This includes managing issuances and repurchases of capital instruments (see section on "Capital management" for details). Additionally, divisional limits for key capital resources are approved by the Group Asset and Liability Committee to ensure alignment with the capital risk appetite (see section on "Resource limit setting" for details).

ERM sets the capital risk framework, assesses the capital risk profile and provides independent challenge. This includes setting of risk appetite thresholds for key capital ratios. Threshold breaches are subject to a dedicated governance framework triggering management actions up to the execution of Deutsche Bank's recovery plan. Thresholds also provide boundaries to the capital plan and are fully integrated into the regular assessment of capital risk under stress scenarios.

Portfolio concentration risk

Risk concentrations refer to clusters of the same or similar risk drivers within specific risk types (intra-risk concentrations in credit, market, operational and strategic risks) as well as across different risk types (inter-risk concentrations). They occur within and across counterparties, businesses, regions/countries, industries and products. The management and monitoring of risk concentrations is achieved through a quantitative and qualitative approach, as follows:

- Intra-risk concentrations are assessed, monitored and mitigated by the individual risk functions (enterprise, credit, market, operational, liquidity and strategic risk management). This is supported by limit setting on different levels and/or management according to each risk type
- Inter-risk concentrations are managed through quantitative top-down stress-testing and qualitative bottom-up reviews, identifying and assessing risk themes independent of any risk type and providing a holistic view across the bank. The diversification effects between credit, market, operational and strategic risk are measured through a dedicated risk model that quantifies the diversification benefit caused by non-perfect correlations between these risk types. The calculation of the risk type diversification benefit is intended to ensure that the standalone economic capital figures for the individual risk types are aggregated in an economically meaningful way

The most senior governance body for the oversight of risk concentrations throughout 2022 was the Group Risk Committee (GRC).

Environmental, social and governance risk

The impacts of rising global temperatures, the enhanced focus on climate change and the transition to a net-zero economy from society, regulators and the banking sector have led to the emergence of new and increasing sources of financial and non-financial risks. These include the physical risks arising from extreme weather events, which are growing in frequency and severity, as well as transition risks as carbon intensive sectors are faced with higher taxation, reduced demand and potentially restricted access to financing. These risks can impact Deutsche Bank across a broad range of financial and non-financial risk types.

Financial institutions are facing increased scrutiny on climate and broader ESG-related issues from governments, regulators, shareholders and other bodies, leading to reputational risks if the Group is not seen to support the transition to a lower carbon economy, to protect biodiversity and human rights. Deutsche Bank is reviewing and enhancing its ESG risk management frameworks in alignment with regulatory guidance and to ensure that we actively manage ESG risks and prevent greenwashing. There is a lack of consistent and comprehensive ESG data and methodologies available today which means that the bank is heavily reliant on proxy estimates and qualitative approaches when assessing these risks and introduce a high degree of uncertainty into climate-related disclosures.

Deutsche Bank is committed to managing business activities and operations in a sustainable manner, including aligning its portfolios with net zero emissions by 2050. In October 2022 Deutsche Bank announced net zero aligned interim (2030) and final (2050) targets for four key carbon intensive sectors: Oil and Gas (upstream), Power Generation, Automotives (light duty vehicles) and Steel. Targets are fully embedded into internal risk management frameworks and processes.

Deutsche Bank's Group Sustainability Committee, which is chaired by the Chief Executive Officer, decides on all important sustainability initiatives. In 2022 the bank appointed its first Chief Sustainability Officer and established a Sustainability Steering Committee responsible for ESG transformation management and oversight. The Group Risk Committee, chaired by the Chief Risk Officer, is established by the Management Board to serve as the central forum for review and decision making on matters related to risk, capital, and liquidity. This includes the responsibility for developing the bank's Climate and broader ESG Risk Frameworks. A dedicated ESG Risk Forum oversees the integration of ESG risks into the bank's existing financial and non-financial risk management frameworks.

Deutsche Bank's business activities are governed by a dedicated Climate and Environmental Risk Policy outlining roles, responsibilities as well as qualitative risk appetite principles and quantitative risk-appetite thresholds and KPIs. In addition, the bank's Environmental and Social policy outlines specific restrictions for certain sectors. Deutsche Bank uses a number of complementary tools to identify and assess risks including the Group's risk identification process, an internal climate risk taxonomy and regular internal reporting of portfolio financed emissions and intensities and progress against net zero targets.

Model Risk Management

Introduction

Model risk is the potential for adverse consequences from decisions based on incorrect or misused model (and non-model estimate) outputs. Model risk can lead to financial loss, poor business or strategic decision making, or damage to its reputation. Deutsche Bank recognizes the use of models and non-model estimates (collectively known as 'estimation approaches') can affect other risk-types, and that model risk is a distinct risk that can increase or decrease aggregate risk across other risk-types.

Deutsche Bank uses estimation approaches for a broad range of decision-making activities, such as: underwriting credits; valuing exposures, instruments, and positions; measuring risk; managing and safeguarding client assets and determining capital and reserve adequacy. The term 'estimation approach' refers to a 'model' or 'non-model estimate' that is a quantitative or qualitative method, system, or approach that applies expert judgement, statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates. Estimation approaches are simplified representations of real-world relationships and are based on assumptions and judgment. Accordingly, the bank is exposed to model risk, which must be identified, measured, and controlled appropriately.

Model risk management oversight is provided by all levels of management, including the Management Board. Management of model risk is underpinned by a framework designed and monitored by 2nd Line of Defence.

Model Risk Management Framework and Governance

Model risk is one of the bank's level 1 risks, and is overseen by the Chief Risk Officer through the setting of a quantitative and qualitative risk appetite statement, and managed through:

- The model risk policy and procedure, and supporting documents aligned to risk appetite, regulatory requirements, and industry best practice, with clear roles and responsibilities for stakeholders
- Inventorization of all sources of model risk, supporting ongoing model risk framework components including risk assessments and attestations
- Key controls for all sources of model risk from development through to decommissioning, including validation, approval, deployment and monitoring
 - Independent Validations, and subsequent 2LoD approvals, verify that models and non-model estimates have been appropriately designed and implemented for their intended scope and purpose, and that respective controls are in place to assure that they continue to perform as expected during their use
 - The controls identify limitations and weaknesses, resulting in findings and compensating controls, these may be conditions for use, such as adjustments or overlays and
- Model risk governance, including senior forums for monitoring and escalation of model risk related topics, as well as monthly updates to the Management Board on the model risk appetite metrics, and periodic model risk updates to the Supervisory Board.

Developments during the reporting period:

In 2022, Deutsche Bank implemented a new model risk management policy covering all aspects of the model risk framework and aligning practices across the bank, including identification, measurement, monitoring, reporting, controls, and mitigation of model risks.

This new framework is supported by the development of an enhanced Model Inventory System which will be the sole strategic bank-wide model risk platform, replacing all other current inventories. The system continues to be enhanced to ensure effective and efficient management of model risk across the bank.

Reputational Risk Management

Within the group's risk management process, reputational risk is defined as the risk of possible damage to Deutsche Bank's brand and reputation, and the associated risk to earnings, capital or liquidity arising from any association, action or inaction which could be perceived by stakeholders to be inappropriate, unethical or inconsistent with the Deutsche Bank's values and beliefs.

Deutsche Bank has limited appetite for transactions or relationships with material reputational risk or in areas which inherently pose a higher reputational risk such as the defence, gaming, or adult entertainment sectors, or where there are certain environmental concerns. Reputational risk cannot be precluded as it can be driven by unforeseeable changes in perception of its practices by its various stakeholders (e.g. public, clients, shareholders and regulators). Deutsche Bank strives to promote sustainable standards that will enhance profitability and minimize reputational risk.

The Reputational Risk Framework (the Framework) is in place to manage the process through which active decisions are taken on matters which may pose a reputational risk, before the event, and in doing so to prevent damage to Deutsche Bank's reputation wherever possible. The Framework provides consistent standards for the identification, assessment and management of reputational risk issues. Reputational impacts which may arise as a consequence of a failure from another risk type, control or process are addressed separately via the associated risk type framework and are therefore not addressed in this section.

The reputational risk could arise from multiple sources including, but not limited to, potential issues with the profile of the counterparty, the business purpose / economic substance of the transaction or product, high risk industries, environmental and social considerations, and the nature of the transaction or product or its structure and terms.

The modelling and quantitative measurement of reputational risk internal capital is implicitly covered in the bank's economic capital framework primarily within strategic risk.

Governance and Organizational Structure

The Framework is applicable across all Business Divisions and Regions. DWS-specific matters are reviewed by a DWS-dedicated reputational risk committee and escalated to the DWS Executive Board where required.

Whilst every employee has a responsibility to protect the bank's reputation, the primary responsibility for the identification, assessment, management, monitoring and, if necessary, referring or reporting of reputational risk matters lies with Deutsche Bank's Business Divisions as the primary risk owners. Each Business Division has an established process through which matters, which are deemed to be a moderate or greater reputational risk are assessed, the Unit Reputational Risk Assessment Process.

The Unit RRAP is required to refer any material reputational risk matters to the respective Regional Reputational Risk Committee. The Framework also sets out a number of matters which are considered inherently higher risk from a reputational risk perspective and are therefore mandatory referrals to the Regional Reputational Risk Committees. The Regional Reputational Risk Committees, which are 2nd LoD Committees, are responsible for ensuring the oversight, governance and coordination of the management of reputational risk in the respective region of Deutsche Bank. The Regional Reputational Risk Committees meet, as a minimum, on a quarterly basis with ad hoc meetings as required. The Group Reputational Risk Committee (GRRRC) is responsible for ensuring the oversight, governance and coordination of the management of reputational risk at Deutsche Bank on behalf of the Group Risk Committee and the Management Board. Additionally, the Group Reputational Risk Committee reviews cases with a Group wide impact and in exceptional circumstances, those that could not be resolved at a regional level.

Risk and capital performance

Capital, Leverage Ratio, TLAC and MREL

Own Funds

The calculation of Deutsche Bank's own funds incorporates the capital requirements following the "Regulation (EU) No 575/2013 on prudential requirements for credit institutions" CRR and the "Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions" "CRD", which have been further amended with subsequent Regulations and Directives. The CRD has been implemented into German law. The information in this section as well as in the section "Development of risk-weighted assets" is based on the regulatory principles of consolidation.

This section refers to the capital adequacy of the group of entities consolidated for banking regulatory purposes pursuant to the CRR and the German Banking Act ("Kreditwesengesetz" or "KWG"). Therein not included are insurance companies or companies outside the finance sector.

The total own funds pursuant to the effective regulations as of year-end 2022 comprises Tier 1 and Tier 2 capital. Tier 1 capital is subdivided into Common Equity Tier 1 capital and Additional Tier 1 capital.

CET 1 capital consists primarily of common share capital (reduced by own holdings) including related share premium accounts, retained earnings (including losses for the financial year, if any) and accumulated other comprehensive income, subject to regulatory adjustments (i.e., prudential filters and deductions), as well as minority interests qualifying for inclusion in consolidated CET 1 capital. Prudential filters for CET 1 capital, according to Articles 32 to 35 CRR, include (i) securitization gains on sale, (ii) cash flow hedges and changes in the value of own liabilities, and (iii) additional value adjustments. CET 1 capital deductions for instance includes (i) intangible assets (exceeding their prudential value), (ii) deferred tax assets that rely on future profitability, (iii) negative amounts resulting from the calculation of expected loss amounts, (iv) net defined benefit pension fund assets, (v) reciprocal cross holdings in the capital of financial sector entities and, (vi) significant and non-significant investments in the capital (CET 1, AT1, Tier 2) of financial sector entities above certain thresholds. All items not deducted (i.e., amounts below the threshold) are subject to risk-weighting.

Additional Tier 1 capital consists of AT1 capital instruments and related share premium accounts as well as noncontrolling interests qualifying for inclusion in consolidated AT1 capital. To qualify as AT1 capital under CRR/CRD, instruments must have principal loss absorption through a conversion to common shares or a write-down mechanism allocating losses at a trigger point and must also meet further requirements (perpetual with no incentive to redeem; institution must have full dividend/coupon discretion at all times, etc.).

Tier 2 capital comprises eligible capital instruments, the related share premium accounts and subordinated long-term debt, certain loan loss provisions and noncontrolling interests that qualify for inclusion in consolidated Tier 2 capital. To qualify as Tier 2 capital, capital instruments or subordinated debt must have an original maturity of at least five years. Moreover, eligible capital instruments may inter alia not contain an incentive to redeem, a right of investors to accelerate repayment, or a credit sensitive dividend feature.

In the comparison period of this report Deutsche Bank presents certain figures based on the CRR definition of own fund instruments applicable for Additional Tier 1 and Tier 2 instruments.

Starting with the first quarter of 2022, CET 1, Tier 1 Capital and Total Capital is presented as reported. The fully loaded definition has been discontinued in the first quarter 2022 due to immaterial differences.

Capital instruments

The Management Board received approval from the 2021 Annual General Meeting to buy back up to 206.7 million shares before the end of April 2026. Thereof 103.3 million shares can be purchased by using derivatives, this includes 41.3 million derivatives with a maturity exceeding 18 months. During the period from the 2021 Annual General Meeting until the 2022 Annual General Meeting (May 19, 2022), 59.8 million shares were purchased. A total amount of 33.3 million shares was purchased for equity compensation purposes in the same period or upcoming periods. The remaining amount of 26.5 million shares was bought back for cancellation with the purpose of distributing capital to shareholders. In addition, 48.8 million call options were purchased for equity compensation purposes in upcoming periods. The number of shares held in Treasury from buybacks amounted to 34.8 million as of the 2022 Annual General Meeting, thereof 26.5 million shares for cancellation and 8.3 million shares for equity compensation purposes.

The 2022 Annual General Meeting granted the Management Board the approval to buy back up to 206.7 million shares before the end of April 2027. Thereof 103.3 million shares can be purchased by using derivatives, this includes 41.3 million derivatives with a maturity exceeding 18 months. These authorizations substitute the authorizations of the previous year. During the period from the 2022 Annual General Meeting until December 31, 2022, no shares or call options were purchased. The number of shares held in Treasury from buybacks amounted to 28.9 million as of December 31, 2022. Thereof 26.5 million relate to shares bought back for cancellation. The remaining amount of 2.4 million relates to shares to be used for equity compensation purposes in upcoming periods.

Since the 2017 Annual General Meeting, renewed at the 2021 Annual General Meeting, and as of December 31, 2022, authorized capital available to the Management Board is € 2,560 million (1,000 million shares). On 30 April 2022, the conditional capital against cash of € 512 million (200 million shares) and for equity compensation of € 51.2 million (20 million shares) expired unused.

Further, the 2022 Annual General Meeting authorized the issuance of participatory notes and other hybrid debt securities that fulfill the regulatory requirements to qualify as Additional Tier 1 capital with an equivalent value of € 9.0 billion on or before April 30, 2027.

Transitional agreements for AT1 and Tier 2 instruments were applicable until 1 January 2022. Capital instruments issued on or prior to December 31, 2011, that no longer qualify as AT1 or Tier 2 capital under the fully loaded CRR/CRD as currently applicable were subject to grandfathering rules during the transitional period and were phased out from 2013 to 2022 with their recognition capped at 20% in 2020 and 10% in 2021 (in relation to the portfolio eligible for grandfathering which was outstanding on December 31, 2012). The grandfathering no longer applies as of January 1, 2022.

The current CRR as applicable since June 27, 2019, provides further grandfathering rules for AT1 and Tier 2 instruments issued prior to June 27, 2019. AT1 and Tier 2 instruments issued through special purpose entities were grandfathered until December 31, 2021. In 2022, transitional arrangements only exist for AT1 and Tier 2 instruments which continue to qualify until June 26, 2025, even if they do not meet certain new requirements that apply since June 27, 2019. Deutsche Bank had an immaterial amount of instruments that qualified during 2022, which resulted in there being no material difference between the “fully loaded” and “transitional” amounts.

Based on the current CRR, the Group has eligible AT1 instruments of € 8.6 billion outstanding as of December 2022. In 2022, the bank issued AT1 notes amounting to € 2.0 billion and redeemed AT1 instruments with a notional of € 1.75 billion.

As of December 31, 2022, Tier 2 capital instruments amounted to € 9.5 billion (nominal value of € 11.7 billion). In 2022, the bank issued Tier 2 capital instruments with a nominal value of € 1.5 billion and U.S. \$ 1.25 billion (equivalent amount of € 1.2 billion) and a notional of € 15 million Tier 2 capital instruments matured.

Minimum capital requirements and additional capital buffers

The Pillar 1 CET 1 minimum capital requirement applicable to the Group is 4.50% of RWA. The Pillar 1 total capital requirement of 8.00% demands further resources that may be met with up to 1.50% Additional Tier 1 capital and up to 2.00% Tier 2 capital.

Failure to meet minimum capital requirements can result in supervisory measures such as restrictions of profit distributions or limitations on certain businesses such as lending. Deutsche Bank complied with the minimum regulatory capital adequacy requirements in 2022.

In addition to these minimum capital requirements, the following combined capital buffer requirements were fully effective beginning 2022 onwards. These buffer requirements must be met in addition to the Pillar 1 minimum capital requirements but can be drawn down in times of economic stress.

The capital conservation buffer is implemented in Section 10c German Banking Act, based on Article 129 CRD and equals a requirement of 2.50% CET 1 capital of RWA in 2022 and onwards.

The countercyclical capital buffer is deployed in a jurisdiction when excess credit growth is associated with an increase in system-wide risk. It may vary between 0% and 2.50% CET 1 capital of RWA. In exceptional cases, it could also be higher than 2.50%. The institution-specific countercyclical buffer that applies to Deutsche Bank is the weighted average of the countercyclical capital buffers that apply in the jurisdictions where our relevant credit exposures are located. As per December 31, 2022, the institution-specific countercyclical capital buffer was at 0.07%.

In addition to the aforementioned buffers, national authorities, such as the BaFin, may require a systemic risk buffer to prevent and mitigate long-term non-cyclical systemic or macro-prudential risks that are not covered by the CRR. They can require an additional buffer of up to 5.00% CET 1 capital of RWA. As of the year end 2022, no systemic risk buffer applied to Deutsche Bank.

Deutsche Bank continues to be designated as a global systemically important institution (G-SII) by the BaFin in agreement with the Deutsche Bundesbank, resulting in a G-SII buffer requirement of 1.50% CET 1 capital of RWA in 2022 based on the indicators as published in 2019. This assessment has been confirmed by the FSB in 2022. Further, BaFin has announced that the G-SII buffer requirement for Deutsche Bank will remain unchanged for the years 2023 and 2024. Deutsche Bank continues to publish the indicators on the bank's website.

Additionally, Deutsche Bank has been classified by BaFin in agreement with the Deutsche Bundesbank as an "other systemically important institution" (O-SII) with an additional capital buffer requirement of 2.00% in 2022 that has to be met on a consolidated level. Hence, for Deutsche Bank, the O-SII buffer amounts to 2.00% in 2022. BaFin has announced O-SII buffer requirement for Deutsche bank remain unchanged for the year 2023. The higher of the buffers for systemically important institutions (G-SII buffer or O-SII buffer) must be applied.

In addition, pursuant to the Pillar 2 SREP, the ECB may impose capital requirements on individual banks which are more stringent than statutory requirements (so-called Pillar 2 requirement).

In February 2022, the ECB informed the Deutsche Bank of its decision effective 1 March 2022 that the bank's Pillar 2 requirement remains unchanged compared to 2021. This result in ECB's Pillar 2 requirement to 2.50% of RWA. As of December 31, 2022, Deutsche Bank needs to maintain on a consolidated basis a CET 1 ratio of at least 10.48%, a Tier 1 ratio of at least 12.45% and a Total Capital ratio of at least 15.07%. The CET 1 requirement comprises the Pillar 1 minimum capital requirement of 4.50%, the Pillar 2 requirement (SREP add-on) of 1.41%, the capital conservation buffer of 2.50%, the countercyclical buffer (subject to changes throughout the year) of 0.07% and the higher of our G-SII/O-SII buffer of 2.00%. Correspondingly, the Tier 1 capital requirement includes additionally a Tier 1 minimum capital requirement of 1.50% plus a Pillar 2 requirement of 0.47%, and the Total Capital requirement includes further a Tier 2 minimum capital requirement of 2.00% and a Pillar 2 requirement of 0.63%. Also, the ECB communicated to Deutsche Bank that its individual expectation to hold a further Pillar 2 CET 1 capital add-on, commonly referred to as 'Pillar 2 guidance' will be seen as guidance only and until at least year-end 2022, a breach of this guidance will not trigger the need to provide a capital restoration plan or a need to execute measures to re-build CET 1 capital.

On December 22, 2022, Deutsche Bank was informed by the ECB of its decision regarding prudential minimum capital requirements for 2023 that applied from January 1, 2023 onwards, following the results of the 2022 SREP. The decision set ECB's Pillar 2 requirement to 2.70% of RWA, effective as of January 1, 2023, of which at least 1.52% must be covered by CET 1 capital and 2.03% by Tier 1 capital.

In January 2022, the BaFin announced a countercyclical buffer of 0.75% for Germany effective February 1, 2023, which translates into approximately 30bps CET 1 capital requirement for Deutsche Bank Group given the current share of German credit exposures. Additionally, the BaFin announced a sectoral systemic risk buffer of 2% for German residential real estate exposures effective February 1, 2023, which translates into approximately 20bps CET 1 capital requirement for Deutsche Bank Group considering our current German residential real estate exposure.

The following table gives an overview of the different Pillar 1 and Pillar 2 minimum capital requirements (but excluding the Pillar 2 guidance) as well as capital buffer requirements applicable to Deutsche Bank for years 2022 and 2023.

Overview total capital requirements and capital buffers

	2022	2023
Pillar 1		
Minimum CET 1 requirement	4.50 %	4.50 %
Combined buffer requirement	4.57 %	5.07 %
Capital Conservation Buffer	2.50 %	2.50 %
Countercyclical Buffer ¹	0.07 %	0.37 %
Systemic Risk Buffer ²	0.00 %	0.20 %
Maximum of:	2.00 %	2.00 %
G-SII Buffer	1.50 %	1.50 %
O-SII Buffer	2.00 %	2.00 %
Pillar 2		
Pillar 2 SREP Add-on of CET 1 capital (excluding the "Pillar 2" guidance)	2.50 %	2.70 %
of which covered by CET 1 capital	1.41 %	1.52 %
of which covered by Tier 1 capital	1.88 %	2.03 %
of which covered by Tier 2 capital	0.63 %	0.68 %
Total CET 1 requirement from Pillar 1 and 2³	10.48 %	11.09 %
Total Tier 1 requirement from Pillar 1 and 2	12.45 %	13.10 %
Total capital requirement from Pillar 1 and 2	15.07 %	15.77 %

¹ Deutsche Bank's countercyclical buffer requirement is subject to country-specific buffer rates decreed by EBA and the Basel Committee of Banking Supervision (BCBS) as well as Deutsche Bank's relevant credit exposures as per respective reporting date; the countercyclical buffer rate for 2023 has been calculated to be 0.37% based on known countercyclical buffer changes in 2023. The countercyclical buffer is subject to changes throughout the year depending on its constituents

² The systemic risk buffer has been calculated at 0.20% for the projected year 2023, subject to changes based on further directives

³ The total Pillar 1 and Pillar 2 CET 1 requirement (excluding the "Pillar 2" guidance) is calculated as the sum of the SREP requirement, the systemic risk buffer requirement, the capital conservation buffer requirement and countercyclical buffer requirement as well as the higher of the G-SII, O-SII

Development of Own Funds

Deutsche Bank's Total Regulatory capital as of December 31, 2022, amounted to € 66.1 billion compared to € 62.7 billion at the end of December 31, 2021. Tier 1 capital as of December 31, 2022, amounted to € 56.6 billion, consisting of CET 1 capital of € 48.1 billion and AT1 capital of € 8.5 billion. The Tier 1 capital was € 1.2 billion higher than at the end of December 31, 2021, driven by an increase in CET 1 capital of € 1.6 billion and decrease in AT1 capital of € 0.4 billion since year end 2021. Tier 2 Capital as of December 31, 2022 amounted to € 9.5 billion compared to € 7.4 billion at the end of December 31, 2021.

The CET 1 capital increase of € 1.6 billion was largely the result of the positive net profit of € 5.5 billion for the year ended December 31, 2022, which includes a positive year end deferred tax valuation adjustment of € 1.4 billion. This was partially offset by regulatory deductions for future common share dividend and AT1 coupon payments of € 1.3 billion which is in line with the ECB Decision (EU) (2015/656) on the recognition of interim or year-end profits in CET 1 capital in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4). In addition, CET 1 capital increased as a result of positive effects from currency translation adjustments of € 0.8 billion net of foreign exchange counter-effects of capital deduction items of € 0.2 billion and actuarial gains of € 0.6 billion due to mark-to-market movements.

These positive impacts were partially offset by deductions from deferred tax assets of € 1.8 billion which include a positive deferred tax asset valuation adjustment of € 1.4 billion in the US, as well as unrealized losses from financial instruments at fair value through other comprehensive income of € 1.3 billion (€ 0.8 billion driven mainly by rising EUR and USD interest rates and € 0.5 billion driven by fair value loss on cash flow hedges as USD rates went up), share buyback of € 0.3 billion, increased regulatory adjustments from prudential filters of € 0.2 billion (additional value adjustments) predominantly from market price dispersions and risk profile changes and pension plans of € 0.2 billion mainly due to rising discount rates.

The AT1 capital decrease of € 0.4 billion was mainly due to the redemption of an AT1 capital instrument with a notional amount of € 1.75 billion during the first quarter of 2022 and € 0.6 billion grandfathered AT1 instruments not eligible from January 1, 2022, partially offset by a newly issued AT1 capital instrument with a notional amount of € 0.75 billion in the second quarter of 2022 and another AT1 capital instrument with a notional amount of € 1.25 billion in the fourth quarter.

The Tier 2 capital increase of € 2.2 billion was mainly due to the issue of new Tier 2 capital instruments with a notional amount of € 2.7 billion in the first quarter of 2022 and € 0.3 billion due to foreign exchange effects partially offset by amortization of € 0.8 billion Tier 2 capital instruments.

Own Funds Template (including RWA and capital ratios)

in € m.	Dec 31, 2022 ³	Dec 31, 2021	
	CRR/CRD	CRR/CRD fully loaded	CRR/CRD
Common Equity Tier 1 (CET 1) capital: instruments and reserves			
Capital instruments, related share premium accounts and other reserves	45,458	45,864	45,864
Retained earnings	12,305	10,506	10,506
Accumulated other comprehensive income (loss), net of tax	(1,314)	(444)	(444)
Independently reviewed interim profits net of any foreseeable charge or dividend ¹	4,183	1,379	1,379
Other	1,002	910	910
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	61,634	58,215	58,215
Common Equity Tier 1 (CET 1) capital: regulatory adjustments			
Additional value adjustments (negative amount)	(2,026)	(1,812)	(1,812)
Other prudential filters (other than additional value adjustments)	600	(14)	(14)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(5,024)	(4,897)	(4,897)
Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (negative amount)	(3,244)	(1,466)	(1,466)
Negative amounts resulting from the calculation of expected loss amounts	(466)	(573)	(573)
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	(1,149)	(991)	(991)
Direct, indirect and synthetic holdings by an institution of own CET 1 instruments (negative amount)	(0)	0	0
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above the 10 % / 15 % thresholds and net of eligible short positions) (negative amount)	0	0	0
Deferred tax assets arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (amount above the 10 % / 15 % thresholds) (negative amount)	0	(151)	(151)
Other regulatory adjustments ²	(2,225)	(1,805)	(1,805)
Total regulatory adjustments to Common Equity Tier 1 (CET 1) capital	(13,536)	(11,709)	(11,709)
Common Equity Tier 1 (CET 1) capital	48,097	46,506	46,506
Additional Tier 1 (AT1) capital: instruments			
Capital instruments and the related share premium accounts	8,578	8,328	8,328
Amount of qualifying items referred to in Art. 484 (4) CRR and the related share premium accounts subject to phase out from AT1	0	N/M	600
Additional Tier 1 (AT1) capital before regulatory adjustments	8,578	8,328	8,928
Additional Tier 1 (AT1) capital: regulatory adjustments			
Direct, indirect and synthetic holdings by an institution of own AT1 instruments (negative amount)	(60)	(60)	(60)
Residual amounts deducted from AT1 capital with regard to deduction from CET 1 capital during the transitional period pursuant to Art. 472 CRR	0	0	0
Other regulatory adjustments	0	0	0
Total regulatory adjustments to Additional Tier 1 (AT1) capital	(60)	(60)	(60)
Additional Tier 1 (AT1) capital	8,518	8,268	8,868
Tier 1 capital (T1 = CET 1 + AT1)	56,616	54,775	55,375
Tier 2 (T2) capital	9,531	7,328	7,358
Total capital (TC = T1 + T2)	66,146	62,102	62,732
Total risk-weighted assets	360,003	351,629	351,629
Capital ratios			
Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets)	13.4	13.2	13.2
Tier 1 capital ratio (as a percentage of risk-weighted assets)	15.7	15.6	15.7
Total capital ratio (as a percentage of risk-weighted assets)	18.4	17.7	17.8

N/M – Not meaningful

¹ Full year profit is recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4)

² Includes capital deductions of € 1.2 billion (Dec 2021: € 1.1 billion) based on ECB guidance on irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme, € 1.0 billion (Dec 2021: € 0.7 billion) based on ECB's supervisory recommendation for a prudential provisioning of non-performing exposures, € 7.4 million (Dec 2021: € 17 million) resulting from minimum value commitments as per Article 36 (1)(n) of the CRR and CET 1 decrease of € 14.7 million (Dec 2021: € 39 million) from IFRS 9 transitional provision as per Article 473a of the CRR

³ Starting with the first quarter of 2022, information is presented as reported as the fully loaded definition has been eliminated as resulting only in an immaterial difference; comparative information for earlier periods is unchanged and based on Deutsche Bank's earlier fully loaded definition

⁴ Numbers may not add up due to rounding

Reconciliation of shareholders' equity to Own Funds

in € m.	CRR/CRD	
	Dec 31, 2022	Dec 31, 2021
Total shareholders' equity per accounting balance sheet (IASB IFRS)	61,772	58,096
Difference between equity per IASB IFRS / EU IFRS ³	187	(68)
Total shareholders' equity per accounting balance sheet (EU IFRS)	61,959	58,027
Deconsolidation/Consolidation of entities	29	265
Of which:		
Additional paid-in capital	0	0
Retained earnings	29	265
Accumulated other comprehensive income (loss), net of tax	0	0
Total shareholders' equity per regulatory balance sheet	61,988	58,292
Minority Interests (amount allowed in consolidated CET 1)	1,002	910
AT1 coupon and shareholder dividend deduction ¹	(1,342)	(987)
Capital instruments not eligible under CET 1 as per CRR 28(1) (22) 0	(14)	0
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	61,634	58,215
Additional value adjustments	(2,026)	(1,812)
Other prudential filters (other than additional value adjustments)	600	(14)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(5,024)	(4,897)
Deferred tax assets that rely on future profitability	(3,244)	(1,617)
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	(1,149)	(991)
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities	0	0
Other regulatory adjustments ²	(2,691)	(2,378)
Common Equity Tier 1 capital⁴	48,097	46,506

¹ Full year profit is recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4)

² Includes capital deductions of € 1.2 billion (Dec 2021: € 1.1 billion) based on ECB guidance on irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme, € 1.0 billion (Dec 2021: € 0.7 billion) based on ECB's supervisory recommendation for a prudential provisioning of non-performing exposures, € 7.4 million (Dec 2021: € 17 million) resulting from minimum value commitments as per Article 36 (1)(n) of the CRR and CET 1 decrease of € 14.7 million (Dec 2021: € 39 million) from IFRS 9 transitional provision as per Article 473a of the CRR

³ Differences in "equity per balance sheet" result entirely from deviations in profit (loss) after taxes due to the application of EU carve-out rules as set forth in the chapter "Basis of preparation/impact of changes in accounting principles". These rules were initially applied in the first quarter 2020.

⁴ Numbers may not add up due to rounding

Development of Own Funds

in € m.	CRR/CRD	
	twelve months ended Dec 31, 2022	twelve months ended Dec 31, 2021
Common Equity Tier 1 (CET 1) capital - opening amount	46,506	44,885
Common shares, net effect	(2)	0
Additional paid-in capital	(79)	(26)
Retained earnings	5,945	2,834
Common shares in treasury, net effect/(+) sales (-) purchase	(325)	1
Movements in accumulated other comprehensive income	(870)	675
AT1 coupon and shareholder dividend deduction ¹	(1,342)	(987)
Additional value adjustments	(215)	(381)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(127)	(262)
Deferred tax assets that rely on future profitability (excluding those arising from temporary differences)	(1,779)	(113)
Negative amounts resulting from the calculation of expected loss amounts	107	(474)
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	(158)	(219)
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities	0	0
Deferred tax assets arising from temporary differences (amount above 10 % and 15 % threshold, net of related tax liabilities where the conditions in Art. 38 (3) CRR are met)	151	(77)
Other, including regulatory adjustments	285	650
Common Equity Tier 1 (CET 1) capital - closing amount	48,097	46,506
Additional Tier 1 (AT1) Capital - opening amount	8,868	6,848
New Additional Tier 1 eligible capital issues	1,967	2,487
Matured and called instruments	(2,350)	(500)
Other, including regulatory adjustments	33	33
Additional Tier 1 (AT1) Capital - closing amount	8,518	8,868
Tier 1 capital	56,616	55,375
Tier 2 (T2) capital - closing amount	9,531	7,358
Total regulatory capital²	66,146	62,732

¹ Full year profit is recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4)

² Numbers may not add up due to rounding

Minimum loss coverage for Non Performing Exposure (NPE)

In April 2019, the EU published requirements Regulation (EU) 2019/630 amending the CRR (Regulation (EU) No 575/2013) for a prudential backstop reserve for non-performing exposure (NPE). This regulation results in a Pillar 1 deduction from CET 1 capital when a minimum loss coverage requirement is not met. It is applied to exposures originated and defaulted after April 25, 2019.

In addition, in March 2018, the ECB published its “Addendum to the ECB Guidance to banks on non-performing loans: supervisory expectations for prudential provisioning of non-performing exposures” and in August 2019, its “Communication on supervisory coverage expectations for NPEs”.

The ECB guidance issued is applicable to all newly defaulted loans after April 1, 2018 (ECB - new NPE's after April 1, 2018) and, similar to the EU rules, it requires banks to take measures in case a minimum impairment coverage requirement is not met. Within the annual SREP discussions ECB may impose Pillar 2 measures on banks in case ECB is not confident with measure taken by the individual bank.

For the year end 2020, we introduced a framework to determine the prudential provisioning of non-performing exposure as a Pillar 2 measure as requested in the before mentioned ECB's guidance and SREP recommendation.

For the minimum loss coverage expectation for NPE's arising from clients defaulted before April 1, 2018 (ECB – NPE Stock) a phase-in path to 100 % coverage expectation was envisaged with an annual increase of 10 %. In a first step, banks were allocated to three comparable groups on the basis of the bank's net NPL ratios as of end-2017 and in a second step an assessment of capacity regarding the potential impact was carried out for each individual bank with a horizon of end-2026. Deutsche Bank has been assigned to Group 1 which requires a full applicability of 100 % minimum loss coverage by year end 2024 for secured loans respectively by year end 2023 for unsecured loans.

The shortfall between the minimum loss coverage requirements for non-performing exposure and the risk reserves recorded in line with the IFRS 9 for defaulted (Stage 3) assets amounted to € 1.048 million as of December 31, 2022 and was deducted from CET 1. This additional CET 1 charge can be considered as additional loss reserve and leads to a € 933 million RWA relief.

Non-performing exposure loss coverage

in € m. (unless stated otherwise)	Dec 31, 2022			
	Exposure value ¹	Total minimum coverage requirement	Available coverage	Applicable amount of insufficient coverage
Corporate Bank	4,378	795	1,176	316
Investment Bank	14,665	8,182	10,117	383
Private Bank	6,101	1,250	2,202	315
Asset Management	0	0	0	0
Capital Release Unit	142	64	41	32
Corporate & Other	140	2	0	2
Total	25,426	10,294	13,535	1,048

¹ Exposure value in accordance with Article 47c CRR.

in € m. (unless stated otherwise)	Dec 31, 2021			
	Exposure value ¹	Total minimum coverage requirement	Available coverage	Applicable amount of insufficient coverage
Corporate Bank	3,746	626	1,109	119
Investment Bank	14,671	7,823	10,155	273
Private Bank	7,119	1,263	2,449	311
Asset Management	0	0	0	0
Capital Release Unit	253	120	102	42
Corporate & Other	22	3	0	3
Total	25,811	9,835	13,816	748

¹ Exposure value in accordance with Article 47c CRR.

Development of risk-weighted assets

The table below provides an overview of RWA broken down by risk type and business division. It includes the aggregated effects of the segmental reallocation of infrastructure related positions, if applicable, as well as reallocations between the segments.

Risk-weighted assets by risk type and business division

	Dec 31, 2022						
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total
Credit Risk	68,022	93,184	79,865	9,417	3,141	15,585	269,214
Settlement Risk	0	63	0	0	0	61	124
Credit Valuation Adjustment (CVA)	130	5,144	29	4	812	65	6,184
Market Risk	847	17,895	72	28	1,493	5,796	26,131
Operational Risk	5,304	23,155	7,637	3,414	18,839	0	58,349
Total	74,303	139,442	87,602	12,864	24,284	21,508	360,003

	Dec 31, 2021						
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total
Credit Risk	59,588	93,125	77,632	11,017	5,426	16,964	263,752
Settlement Risk	0	1	0	0	10	49	60
Credit Valuation Adjustment (CVA)	120	4,879	167	9	1,098	55	6,327
Market Risk	128	17,565	40	33	1,293	715	19,773
Operational Risk	5,571	25,031	7,527	3,357	20,232	0	61,718
Total	65,406	140,600	85,366	14,415	28,059	17,783	351,629

The RWA of Deutsche Bank were € 360.0 billion as of December 31, 2022, compared to € 351.6 billion at the end of 2021. The increase of € 8.4 billion was driven by market risk RWA and credit risk RWA, and was partially offset by operational risk RWA. Higher market risk RWA by € 6.4 billion was primarily driven by increases in the VaR and SVaR components through a combination of a higher capital multiplier, following backtesting outliers and higher VaR due to more volatile data in the last one-year window. The increase in credit risk RWA by € 5.5 billion was primarily driven by foreign exchange movements, ECB mandated model adjustments and other methodological updates, impacts on the back of market uncertainties and business growth within Core businesses. This was partially offset by RWA decreases within the Capital Release Unit and Asset Management as well as an updated treatment for hedged exposures and equity investments. The operational risk RWA reduction of € 3.4 billion was mainly driven by a more favorable development of Deutsche Bank's internal loss profile feeding into the capital model.

The tables below provide an analysis of key drivers for risk-weighted asset movements observed for credit risk, credit valuation adjustments as well as market and operational risk in the reporting period. They also show the corresponding movements in capital requirements, derived from the RWA by an 8% capital ratio.

Development of risk-weighted assets for Credit Risk including Counterparty Credit Risk

	Dec 31, 2022		Dec 31, 2021	
in € m.	Credit risk RWA	Capital requirements	Credit risk RWA	Capital requirements
Credit risk RWA balance, beginning of year	263,752	21,100	222,708	17,817
Book size	(6,254)	(500)	4,719	378
Book quality	(478)	(38)	(899)	(72)
Model updates	(179)	(14)	(97)	(8)
Methodology and policy	8,244	659	30,172	2,414
Acquisition and disposals	0	0	131	10
Foreign exchange movements	5,320	426	6,431	514
Other	(1,191)	(95)	587	47
Credit risk RWA balance, end of year	269,214	21,537	263,752	21,100

Of which: Development of risk-weighted assets for Counterparty Credit Risk

	Dec 31, 2022		Dec 31, 2021	
in € m.	Counterparty credit risk RWA	Capital requirements	Counterparty credit risk RWA	Capital requirements
Counterparty credit risk RWA balance, beginning of year	24,780	1,982	23,814	1,905
Book size	(1,734)	(139)	(4,527)	(362)
Book quality	(41)	(3)	(422)	(34)
Model updates	0	0	125	10
Methodology and policy	0	0	4,805	384
Acquisition and disposals	0	0	0	0
Foreign exchange movements	584	47	986	79
Other	0	0	0	0
Counterparty credit risk RWA balance, end of year	23,589	1,887	24,780	1,982

The classifications of key drivers for the RWA credit risk development table are fully aligned with the recommendations of the Enhanced Disclosure Task Force (EDTF). Organic changes in the Group's portfolio size and composition are considered in the category "book size". The category "book quality" mainly represents the effects from portfolio rating migrations, loss given default, model parameter recalibrations as well as collateral and netting coverage activities. "Model updates" include model refinements and advanced model roll out. RWA movements resulting from externally, regulatory-driven changes, e.g. applying new regulations, are considered in the "methodology and policy" section. "Acquisition and disposals" is reserved to show significant exposure movements which can be clearly assigned to new businesses or disposal-related activities. Changes that cannot be attributed to the above categories are reflected in the category "other".

The increase in RWA for credit risk by 2.1% or € 5.5 billion since December 31, 2021, is mainly driven by the categories "methodology and policy" and FX related movements. This is partially offset by changes shown in the categories "book size", "other", "book quality" and "model updates". The category "methodology and policy" mainly reflects impacts driven by the introduction of the EBA Guidelines, partly offset by an updated treatment for equity investments. These increases were partly offset by a decrease in category "book size", which reflects a change in composition of Deutsche Bank's portfolio, as an effect of balance sheet management. The decrease in the category "book quality" reflects an updated treatment for hedged exposures and impacts for rating changes, partly offset by impacts on the back of market uncertainties and an updated treatment for certain guarantees. Additionally, the decrease in category "other" reflects a reduction in RWA for deferred tax assets. Furthermore, the reduction in category "model updates" is driven by refinements on Deutsche Bank's IRBA model.

The decrease in RWA for counterparty credit risk by 4.8% or € 1.2 billion since December 31, 2021, is mainly driven by the decrease in category "book size" driven by a reduction in trading activities as part of balance sheet management as well as a decrease in category "book quality" particularly stemming from rating change impacts. This was partly offset by FX movements over the year.

Based on the CRR/CRD regulatory framework, we are required to calculate RWA using the CVA which takes into account the credit quality of our counterparties. RWA for CVA covers the risk of mark-to-market losses on the expected counterparty risk in connection with OTC derivative exposures. We calculate the majority of the CVA based on our own internal model as approved by the BaFin.

Development of risk-weighted assets for Credit Valuation Adjustment

in € m.	Dec 31, 2022		Dec 31, 2021	
	CVA RWA	Capital requirements	CVA RWA	Capital requirements
CVA RWA balance, beginning of year	6,327	506	8,392	671
Movement in risk levels	1,217	97	(450) ¹	(36)
Market data changes and recalibrations	(200)	(16)	(1,581)	(126)
Model updates	(1,160)	(93)	0	0
Methodology and policy	0	0	0	0
Acquisitions and disposals	0	0	(33)	(3) ¹
Foreign exchange movements	0	0	0	0
CVA RWA balance, end of year	6,184	495	6,327¹	506

¹ Prior year's (or: years') comparatives aligned to presentation in the current year.

The development of CVA RWA is broken down into a number of categories: "Movement in risk levels", which includes changes to the portfolio size and composition; "Market data changes and calibrations", which includes changes in market data levels and volatilities as well as recalibrations; "Model updates" refers to changes to either the IMM credit exposure models or the value-at-risk models that are used for CVA RWA; "Methodology and policy" relates to changes to the regulation. Any significant business acquisitions or disposals would be presented in the category with that name.

As of December 31, 2022, the RWA for CVA amounted to € 6.2 billion, representing a decrease of € 0.1 billion (-2%) compared to December 31, 2021. The small decrease is primarily a net effect of methodology refinements resulting in a decrease in Q2 offset by an increase from business activities throughout the year.

Development of risk-weighted assets for Market Risk

in € m.						Dec 31, 2022
	VaR	SVaR	IRC	Other	Total RWA	Total capital requirements
Market risk RWA balance, beginning of year	3,538	9,360	3,657	3,219	19,773	1,582
Movement in risk levels	(175)	1,986	(17)	266	2,061	165
Market data changes and recalibrations	2,651	(617)	0	(593)	1,441	115
Model updates/changes	100	(650)	0	0	(550)	(44)
Methodology and policy	1,299	2,142	0	0	3,441	275
Acquisitions and disposals	0	0	0	0	0	0
Foreign exchange movements	0	0	0	113	113	9
Other	0	0	0	0	0	0
Market risk RWA balance, end of year	7,413	12,221	3,639	2,857	26,131	2,091

	Dec 31, 2021					
in € m.	VaR	SVaR	IRC	Other	Total RWA	Total capital requirements
Market risk RWA balance, beginning of year	12,109	6,983	7,005	2,799	28,897	2,312
Movement in risk levels	(1,067)	537	(3,349)	28	(3,850)	(308)
Market data changes and recalibrations	(4,943)	0	0	334	(4,609)	(369)
Model updates/changes	(2,196)	2,675	0	0	479	38
Methodology and policy	(366)	(835)	0	0	(1,201)	(96)
Acquisitions and disposals	0	0	0	0	0	0
Foreign exchange movements	0	0	0	57	57	5
Other	0	0	0	0	0	0
Market risk RWA balance, end of year	3,538	9,360	3,657	3,219	19,773	1,582

The analysis for market risk covers movements in the bank's internal models for value-at-risk (VaR), stressed value-at-risk (SVaR), incremental risk charge (IRC) as well as results from the market risk standardized approach (MRSA), which is captured in the table under the category "Other". MRSA is used to determine the regulatory capital charge for the specific market risk of trading book securitizations, for certain types of investment funds and for longevity risk as set out in CRR/CRD regulations.

The market risk RWA movements due to changes in market data levels, volatilities, correlations, liquidity and ratings are included under the "Market data changes and recalibrations" category. Changes to our market risk RWA internal models, such as methodology enhancements or risk scope extensions, are included in the category of "Model updates". In the "Methodology and policy" category we reflect regulatory driven changes to our market risk RWA models and calculations. Significant new businesses and disposals would be assigned to the line item "Acquisition and disposals". The impacts of "Foreign exchange movements" are only calculated for the CRM and Standardized approach methods.

As of December 31, 2022 the RWA for market risk was € 26.1 billion which has grown by € 6.4 billion (+32%) since December 31, 2021. The growth was driven by the "Methodology and policy" category following an increase in the capital multiplier on the back of an increase in backtesting outliers during the year; and by the "Market data changes and recalibrations" category impacting value-at-risk due to inclusion of increased market volatility in the rolling 1yr period. Additionally, stressed value-at-risk increased due to a change in the 1-year window used in the calculation following the regular stress period selection review.

Development of risk-weighted assets for operational risk

	Dec 31, 2022		Dec 31, 2021	
in € m.	Operational risk RWA	Capital requirements	Operational risk RWA	Capital requirements
Operational risk RWA balance, beginning of year	61,718	4,937	68,899	5,512
Loss profile changes (internal and external)	(3,405)	(272)	(8,000)	(640)
Expected loss development	(166)	(13)	(113)	(9)
Forward looking risk component	794	63	(278)	(22)
Model updates	(669)	(54)	1,210	97
Methodology and policy	78	6	0	0
Acquisitions and disposals	0	0	0	0
Operational risk RWA balance, end of year	58,349	4,668	61,718	4,937

Changes in internal and external loss events are reflected in the category "Loss profile changes". The category "Expected loss development" is based on divisional business plans as well as historical losses and is deducted from the AMA capital figure within certain constraints. The category "Forward looking risk component" reflects qualitative adjustments and, as such, the effectiveness and performance of the day-to-day operational risk management activities via NFR appetite metrics and RCA scores, focusing on the business environment and internal control factors. The category "Model updates" covers model refinements, such as the implementation of model changes. The category "Methodology and policy" represents externally driven changes such as regulatory add-ons. The category "Acquisition and disposals" represents significant exposure movements which can be clearly assigned to new or disposed businesses.

The overall decrease of the RWA for operational risk by € 3.4 billion was mainly driven by lower loss frequencies feeding into our capital model.

A minor loss deductible increase led to an RWA decrease of € 0.2 billion while the forward-looking component was impacted by small changes to RCA scores, resulting in an RWA increase of € 0.8 billion.

The RWA decrease of € 0.7 billion from model updates was driven by two process changes. The first one comprised a refined reflection of the input into the forward-looking risk component. The second change was a consequence of the enhanced scenario analysis component within the bank's risk management process.

Economic Capital

Economic capital adequacy

Deutsche Bank's internal capital adequacy assessment process (ICAAP) aims at maintaining the continuity of the bank on an ongoing basis. Internal capital adequacy is assessed from an economic perspective as the ratio of economic capital supply divided by economic capital demand as shown in the table below.

Total economic capital supply and demand

in € m. (unless stated otherwise)	Dec 31, 2022	Dec 31, 2021
Components of economic capital supply		
Shareholders' equity	61,959	58,027
Noncontrolling interests ¹	897	858
AT1 coupons deduction	(319)	(298)
Gain on sale of securitizations, cash flow hedges	790	42
Fair value gains on own debt and debt valuation adjustments, subject to own credit risk	(190)	(56)
Additional valuation adjustments	(2,026)	(1,812)
Intangible assets	(3,677)	(3,583)
IFRS deferred tax assets excl. temporary differences	(3,937)	(1,653)
Expected loss shortfall	(466)	(573)
Defined benefit pension fund assets	(1,176)	(991)
Other adjustments	(1,864)	(1,492)
Economic capital supply	49,989	48,470
Components of economic capital demand		
Credit risk	11,802	11,725
Market risk	6,355	7,920
Operational risk	4,668	4,937
Strategic risk	1,854	3,173
Diversification benefit	(3,778)	(4,213)
Total economic capital demand	20,900	23,542
Economic capital adequacy ratio	239 %	206 %

¹ Includes noncontrolling interest up to the economic capital requirement for each subsidiary

The economic capital adequacy ratio was 239% as of December 31, 2022, compared with 206% as of December 31, 2021. The improvement in the ratio was due to a decrease in economic capital demand and an increase in economic capital supply. The economic capital supply increased by € 1.5 billion compared to year-end 2021 mainly driven by higher shareholders' equity of € 3.9 billion. The increase in shareholders' equity was due to net income of € 5.5 billion, which was partly offset by higher unrealized losses of € 1.3 billion and share buybacks of € 0.3 billion. This positive impact was partly offset by higher capital deduction of € 2.3 billion related to a valuation adjustment for IFRS deferred tax assets excl. temporary differences. The decrease in economic capital demand is explained in the section "Risk Profile".

Leverage Ratio

Deutsche Bank manages its balance sheet on a Group level and, where applicable, locally in each region. In the allocation of financial resources, the Group favors business portfolios with the highest positive impact on its profitability and shareholder value. The Group monitors and analyzes balance sheet developments and tracks certain market-observed balance sheet ratios. Based on this the Group triggers discussion and management action by the Group Risk Committee.

Leverage Ratio according to CRR/CRD framework

The non-risk-based leverage ratio is intended to act as a supplementary measure to the risk-based capital requirements. Its objectives are to constrain the build-up of leverage in the banking sector, helping avoid destabilizing deleveraging processes which can damage the broader financial system and the economy, and to reinforce the risk-based requirements with a simple, non-risk based "backstop" measure.

A minimum leverage ratio requirement of 3% was introduced effective starting with June 28, 2021. From January 1, 2023, an additional leverage ratio buffer requirement of 50% of the applicable G-SII buffer rate will apply. This additional requirement will equal 0.75% for Deutsche Bank.

Deutsche Bank calculates its leverage ratio exposure in accordance with Articles 429 to 429g of the CRR.

The Group's total leverage ratio exposure includes derivatives, securities financing transactions (SFTs), off-balance sheet exposure and other on-balance sheet exposure (excluding derivatives and SFTs).

The leverage exposure for derivatives is calculated by using a modified version of the standardized approach for counterparty credit risk (SA-CCR), comprising the current replacement cost plus a regulatory defined add-on for the potential future exposure. The effective notional amount of written credit derivatives, i.e., the notional reduced by any negative fair value changes that have been incorporated in Tier 1 capital is included in the leverage ratio exposure measure; the resulting exposure measure is further reduced by the effective notional amount of purchased credit derivative protection on the same reference name provided certain conditions are met.

The SFT component includes the gross receivables for SFTs, which are netted with SFT payables if specific conditions are met. In addition to the gross exposure a regulatory add-on for the counterparty credit risk is included.

The off-balance sheet exposure component follows the credit risk conversion factors (CCF) of the standardized approach for credit risk (0%, 20%, 50%, or 100%), which depend on the risk category subject to a floor of 10%.

The on-balance sheet exposures (excluding derivatives and SFTs) component reflects the accounting values of the assets (excluding derivatives, SFTs and regular-way purchases and sales awaiting settlement) as well as regulatory adjustments for asset amounts deducted in determining Tier 1 capital. The exposure value of regular-way purchases and sales awaiting settlement is determined as offset between those cash receivables and cash payables where the related regular-way sales and purchases are both settled on a delivery-versus-payment basis.

The following tables show the leverage ratio exposure and the leverage ratio. The Leverage ratio common disclosure table provides the leverage ratio on a fully loaded and phase-in basis with the fully loaded and phase-in Tier 1 Capital, respectively, in the numerator. For further details on Tier 1 capital please also refer to the section "Development of Own Funds".

Summary reconciliation of accounting assets and leverage ratio exposures

in € bn.	Dec 31, 2022	Dec 31, 2021 ¹
Total assets as per published financial statements	1,337	1,324
Adjustment for entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation	2	1
Adjustments for derivative financial instruments	(171)	(163)
Adjustment for securities financing transactions (SFTs)	1	2
Adjustment for off-balance sheet items (i.e. conversion to credit equivalent amounts of off-balance sheet exposures)	128	115
Other adjustments	(57)	(154)
Leverage ratio total exposure measure	1,240	1,125

¹ Since April 1, 2022, Deutsche Bank no longer excludes certain central bank exposures (amounting to € 99 billion as of December 31, 2021), based on Article 429a (1) (n) CRR and the ECB decision 2021/1074 as this temporary exemption during the COVID-19 pandemic ended on March 31, 2021; not applying the temporary exclusion of certain central bank exposures the leverage exposure was € 1,223 billion as of December 31, 2021

Leverage ratio common disclosure

in € bn. (unless stated otherwise)	Dec 31, 2022	Dec 31, 2021 ¹
Total derivative exposures	130	138
Total securities financing transaction exposures	96	91
Total off-balance sheet exposures	128	115
Other Assets	897	791
Asset amounts deducted in determining Tier 1 capital	(11)	(9)
Tier 1 capital (fully loaded)²	N/M	54.8
Leverage ratio total exposure measure²	N/M	1,125
Leverage ratio (fully loaded, in %)²	N/M	4.9
Tier 1 capital (phase-in)	56.6	55.4
Leverage ratio total exposure measure	1,240	1,125
Leverage ratio (phase-in, in %)	4.6	4.9

¹ Since April 1, 2022, Deutsche Bank no longer excludes certain central bank exposures (amounting to € 99 billion as of December 31, 2021), based on Article 429a (1) (n) CRR and the ECB decision 2021/1074 as this temporary exemption during the COVID-19 pandemic ended on March 31, 2021; not applying the temporary exclusion of certain central bank exposures the leverage exposure was € 1,223 billion as of December 31, 2021, corresponding to a leverage ratio of 4.5%.

² Starting with first quarter of 2022, leverage numbers are presented as reported as the fully loaded definition has been eliminated as resulting only in an immaterial difference; comparative information of earlier periods is based on Deutsche Bank's earlier fully loaded definition.

Description of the factors that had an impact on the leverage ratio in 2022

Since April 1, 2022, Deutsche Bank no longer excludes certain central bank exposures from its leverage exposure. This temporary exemption during the COVID-19 pandemic, which was based on Article 429a (1) (n) CRR and the ECB Decision 2021/1074, ended on March 31, 2022. As a consequence, also the applicable minimum leverage ratio no longer has to be increased and is therefore at 3.0%.

As of December 31, 2022, the leverage ratio was 4.6% compared to 4.9% as of December 31, 2021. This takes into account a Tier 1 capital of € 56.6 billion over an applicable exposure measure of € 1,240 billion as of December 31, 2022 (€ 55.4 billion and € 1,125 billion as of December 31, 2021, respectively). Not applying the temporary exclusion of certain central bank exposures amounting to € 99 billion the leverage exposure was € 1,223 billion as of December 31, 2021, corresponding to a leverage ratio of 4.5%.

Not considering the temporary exclusion of certain central bank balance for December 31, 2021, over the year 2022 the leverage exposure increased by € 17 billion to € 1,240 billion, largely driven by off-balance sheet leverage exposures which increased by € 13 billion corresponding to higher notional amounts for irrevocable lending commitments. The leverage exposure for the asset items not related to derivatives and SFTs increased by € 8 billion. This reflects the development of the balance sheet (for additional information please refer to section "Movements in assets and liabilities" in this report): loans grew by € 14 billion, cash and central bank/interbank balances decreased by € 13 billion and non-derivative trading assets decreased by € 7 billion. Pending settlements decreased by € 1 billion on a net basis in line with the € 1 billion decrease on a gross basis. The remaining asset items increased by € 15 billion, largely related to Held-to-collect debt securities. Furthermore, SFT-related items (securities purchased under resale agreements, securities borrowed and receivables from prime brokerage) increased by € 6 billion, in line with the development on the balance sheet. In addition, the leverage exposure related to derivatives decreased by € 8 billion. The € 2 billion reduction in Asset amounts deducted in determining Tier 1 capital mainly reflects higher capital deductions for deferred tax assets.

The increase in leverage exposure in 2022 included a positive foreign exchange impact of € 22 billion mainly due to the strengthening of the U.S. Dollar versus the Euro. The effects from foreign exchange rate movements are embedded in the movement of the leverage exposure items discussed in this section.

For main drivers of the Tier 1 capital development please refer to section "Development of Own Funds".

Minimum Requirement of Own Funds and Eligible Liabilities and Total Loss Absorbing Capacity

MREL Requirements

The minimum requirement for own funds and eligible liabilities (MREL) requirement was introduced by the European Union's Regulation establishing uniform rules and a uniform procedure for the resolution of credit institutions (Single Resolution Mechanism Regulation or SRMR) and the European Union's Directive establishing a framework for the recovery and resolution of credit institutions (Bank Recovery and Resolution Directive or BRRD) as implemented into German law by the German Recovery and Resolution Act.

The currently required level of MREL is determined by the competent resolution authorities for each supervised bank individually on a case-by-case basis, depending on the respective preferred resolution strategy. In the case of Deutsche Bank AG, MREL is determined by the Single Resolution Board. While there is no statutory minimum level of MREL, the SRMR, BRRD and a delegated regulation set out criteria which the resolution authority must consider when determining the relevant required level of MREL. Guidance is provided through an MREL policy published annually by the SRB. Any binding MREL ratio determined by the SRB is communicated to Deutsche Bank via the German Federal Financial Supervisory Authority (BaFin).

The SRB has revised Deutsche Bank AG's binding MREL ratio requirement in the last quarter of 2021 applicable immediately. These new requirements for the first time reflect the legal changes of the banking reform package via amendments to the SRMR and the BRRD provided in June 2019 with the publication of Regulation (EU) 2019/877 and Directive (EU) 2019/879. As a result, the MREL and subordinated MREL requirement will no longer be expressed as a percentage of TLOF but as a percentage of RWA and LRE. The MREL ratio requirement on a consolidated basis was set at 24.05% of RWA and 6.88% of LRE of which 20.27% of RWA and 6.88% of LRE must be met with own funds and subordinated instruments.

As a result of its regular annual review and based on an extraordinary assessment of the impact on the MREL requirements from the European Central Bank ending its temporary relief measure to exclude certain exposures to central banks from LRE, the SRB has updated Deutsche Bank AG's binding MREL ratio requirements in the second quarter of 2022 applicable immediately. The MREL ratio requirement on a consolidated basis is now 24.89% of RWA and 7.01% of LRE of which 20.28% of RWA and 7.01% of LRE must be met with own funds and subordinated instruments.

The combined buffer requirements of 4.57% as of December 31, 2022 must be met in addition to the RWA based MREL and subordinated MREL requirements.

TLAC Requirements

Since June 27, 2019, Deutsche Bank, as a global systemically important bank, has also become subject to global minimum standards for its Total Loss-Absorbing Capacity (TLAC). The TLAC requirement was implemented via amendments to the Capital Requirements Regulation and the Capital Requirements Directive provided in June 2019 with the publication of Regulation (EU) 2019/876 and Directive (EU) 2019/878.

This TLAC requirement is based on both risk-based and non-risk-based denominators and set at the higher-of 16% of RWA plus the combined buffer requirements and 6.00% of LRE for a transitional period until December 31, 2021. Since January 1, 2022, the requirement is set at the higher-of 18% of RWA plus the combined buffer requirements and 6.75% of LRE.

MREL ratio development

As of December 31, 2022, available MREL were € 123.7 billion, corresponding to a ratio of 34.35% of RWA. This means that Deutsche Bank has a comfortable MREL surplus of € 17.6 billion above Deutsche Bank's MREL requirement of € 106.1 billion (i.e. 29.46% of RWA including combined buffer requirement). € 115.9 billion of Deutsche Bank's available MREL were own funds and subordinated liabilities, corresponding to a MREL subordination ratio of 32.20% of RWA, a buffer of € 26.4 billion over Deutsche Bank's subordination requirement of € 89.5 billion (i.e. 24.85% of RWA including combined buffer requirements). Compared to December 31, 2021 the surpluses above both Deutsche Bank's MREL requirement and Deutsche Bank's subordinated MREL requirement have increased mainly driven by both higher own funds and higher eligible liabilities. This was partially offset by increases in Deutsche Bank's MREL requirement. These developments also impacted Deutsche Bank's TLAC ratio. Both Deutsche Bank's MREL and MREL subordination surplus over the requirement remain constrained by RWA.

TLAC ratio development

As of December 31, 2022, TLAC was € 115.9 billion and the corresponding TLAC ratios were 32.20% of RWA and 9.34% of LRE. This means that Deutsche Bank has a comfortable TLAC surplus of € 32.2 billion over its TLAC requirement of € 83.7 billion (6.75% of LRE).

MREL and TLAC disclosure

in € m.

(unless stated otherwise)

	Dec 31, 2022	Dec 31, 2021
Regulatory capital elements of TLAC/MREL		
Common Equity Tier 1 capital (CET 1)	48,097	46,506
Additional Tier 1 (AT1) capital instruments eligible under TLAC/MREL	8,518	8,868
Tier 2 (T2) capital instruments eligible under TLAC/MREL		
Tier 2 (T2) capital instruments before TLAC/MREL adjustments	9,531	7,358
Tier 2 (T2) capital instruments adjustments for TLAC/MREL	1,898	1,208
Tier 2 (T2) capital instruments eligible under TLAC/MREL	11,429	8,566
Total regulatory capital elements of TLAC/MREL	68,045	63,941
Other elements of TLAC/MREL		
Senior non-preferred plain vanilla	47,862	45,153
Holdings of eligible liabilities instruments of other G-SIIs (TLAC only)	0	0
Total Loss Absorbing Capacity (TLAC)	115,907	109,094
Add back of holdings of eligible liabilities instruments of other G-SIIs (TLAC only)	0	0
Available Own Funds and subordinated Eligible Liabilities (subordinated MREL)	115,907	109,094
Senior preferred plain vanilla	4,552	5,759
Senior preferred structured products	3,215	0
Available Minimum Own Funds and Eligible Liabilities (MREL)	123,674	114,853
Risk Weighted Assets (RWA)	360,003	351,629
Leverage Ratio Exposure (LRE)	1,240,483	1,124,667
TLAC ratio		
TLAC ratio (as percentage of RWA)	32.20	31.03
TLAC requirement (as percentage of RWA)	22.57	20.53
TLAC ratio (as percentage of Leverage Exposure)	9.34	9.70
TLAC requirement (as percentage of Leverage Exposure)	6.75	6.00
TLAC surplus over RWA requirement	34,638	36,919
TLAC surplus over LRE requirement	32,174	41,614
MREL subordination		
MREL subordination ratio (as percentage of RWA)	32.20	31.03
MREL subordination requirement (as percentage of RWA)	24.85	24.79
Surplus over MREL subordination requirement	26,430	21,909
MREL ratio		
MREL ratio (as percentage of RWA)	34.35	32.66
MREL requirement (as percentage of RWA)	29.46	28.58
MREL surplus over requirement	17,600	14,372

Own Funds and Eligible Liabilities

To meet the MREL and TLAC requirement, Deutsche Bank needs to ensure that enough eligible liabilities instruments are maintained. Instruments eligible for MREL and TLAC are regulatory capital instruments (own funds) and liabilities that meet certain criteria, which are referred to as eligible liabilities.

Own funds used for MREL and TLAC include the full amount of Tier 2 capital instruments with a remaining maturity of greater than 1 year and less than 5 years which are reflected in regulatory capital on a pro-rata basis only.

Eligible liabilities are liabilities issued out of the resolution entity Deutsche Bank AG that meet eligibility criteria which are supposed to ensure that they are structurally suited as loss-absorbing capital. As a result, eligible liabilities exclude deposits which are covered by an insurance deposit protection scheme or which are preferred under German insolvency law (e.g., deposits from private individuals as well as small and medium-sized enterprises). Among other things, secured liabilities and derivatives liabilities are generally excluded as well. Debt instruments with embedded derivative features can be included under certain conditions (e.g. a known and fixed or increasing principal). In addition, eligible liabilities must have a remaining time to maturity of at least one year and must either be issued under the law of a Member State of the European Union or must include a bail-in clause in their contractual terms to make write-down or conversion effective. The SRB has granted a transitional period for liabilities issued under UK law on or before November 15, 2018, which do not include an enforceable and effective bail-in clause but can still be included in eligible liabilities after Brexit until June 28, 2025.

In addition, eligible liabilities need to be subordinated to be counted against the TLAC and MREL subordination requirements. Effective January 1, 2017, the German Banking Act provided for a new class of statutorily subordinated debt securities that rank as senior non-preferred below the bank's other senior liabilities (but in priority to the bank's contractually subordinated liabilities, such as those qualifying as Tier 2 instruments). Following a harmonization effort by the European Union implemented in Germany effective July 21, 2018, banks are permitted to now decide if a specific issuance of eligible senior debt will be in the non-preferred or in the preferred category. Any such senior non-preferred debt instruments issued by Deutsche Bank AG under such rules rank on parity with its outstanding debt instruments that were classified as senior non-preferred under the prior rules. All these senior non-preferred issuances meet the TLAC and MREL subordination criteria.

Credit Risk Exposure

Deutsche Bank defines its credit exposure by taking into account all transactions where losses might occur due to the fact that counterparties may not fulfill their contractual payment obligations as defined under 'Credit Risk Framework'.

Maximum Exposure to Credit Risk

The maximum exposure to credit risk table shows the direct exposure before consideration of associated collateral held and other credit enhancements (netting and hedges) that do not qualify for offset in the financial statements for the periods specified. The netting credit enhancement component includes the effects of legally enforceable netting agreements as well as the offset of negative mark-to-markets from derivatives against pledged cash collateral. The collateral credit enhancement component mainly includes real estate, collateral in the form of cash as well as securities-related collateral. In relation to collateral, the Group applies internally determined haircuts and additionally cap all collateral values at the level of the respective collateralized exposure.

Maximum Exposure to Credit Risk

	Dec 31, 2022					
	Credit Enhancements					
in € m.	Maximum exposure to credit risk ¹	Subject to impairment	Netting	Collateral	Guarantees and Credit derivatives ²	Total credit enhancements
Financial assets at amortized cost³						
Cash and central bank balances	178,897	178,897	–	0	–	0
Interbank balances (w/o central banks)	7,199	7,199	–	0	0	0
Central bank funds sold and securities purchased under resale agreements	11,479	11,479	700	10,771	–	11,471
Securities borrowed	0	0	–	0	–	0
Loans	495,979	495,979	–	269,428	38,899	308,327
Other assets subject to credit risk ^{4,5}	98,336	93,221	29,171	871	317	30,359
Total financial assets at amortized cost³	791,891	786,776	29,871	281,070	39,216	350,158
Financial assets at fair value through profit or loss⁶						
Trading assets	90,180	–	–	1,573	1,264	2,837
Positive market values from derivative financial instruments	299,856	–	227,361	53,290	6	280,657
Non-trading financial assets mandatory at fair value through profit or loss	88,799	–	2,480	78,920	69	81,469
Of which:						
Securities purchased under resale agreement	63,855	–	2,480	61,376	0	63,855
Securities borrowed	17,414	–	–	17,300	0	17,300
Loans	1,037	–	–	78	46	124
Financial assets designated at fair value through profit or loss	168	–	–	0	94	94
Total financial assets at fair value through profit or loss	479,002	–	229,841	133,783	1,433	365,057
Financial assets at fair value through OCI	31,675	31,675	0	2,622	879	3,500
Of which:						
Securities purchased under resale agreement	2,156	2,156	–	1,732	0	1,732
Securities borrowed	0	0	–	0	0	0
Loans	4,069	4,069	–	11	879	890
Total financial assets at fair value through OCI	31,675	31,675	–	2,622	879	3,500
Financial guarantees and other credit related contingent liabilities ⁷	67,214	67,214	–	4,738	7,482	12,220
Revocable and irrevocable lending commitments and other credit related commitments ⁷	251,021	249,959	–	24,769	5,694	30,463
Total off-balance sheet	318,234	317,173	–	29,507	13,176	42,683
Maximum exposure to credit risk	1,620,803	1,135,624	259,712	446,982	54,704	761,398

¹ Does not include credit derivative notional sold (€ 738,733 million) and credit derivative notional bought protection

² Bought Credit protection is reflected with the notional of the underlying

³ All amounts at gross value before deductions of allowance for credit losses

⁴ All amounts at amortized cost (gross) except for qualifying hedge derivatives, which are reflected at Fair value through P&L

⁵ Includes Asset Held for Sale regardless of accounting classification

⁶ Excludes equities, other equity interests and commodities

⁷ Figures are reflected at notional amounts

	Dec 31, 2021					
			Credit Enhancements			
in € m.	Maximum exposure to credit risk ¹	Subject to impairment	Netting	Collateral	Guarantees and Credit derivatives ²	Total credit enhancements
Financial assets at amortized cost ³						
Cash and central bank balances	192,025	192,025	–	0	–	0
Interbank balances (w/o central banks)	7,345	7,345	–	0	0	0
Central bank funds sold and securities purchased under resale agreements	8,370	8,370	–	8,070	–	8,070
Securities borrowed	63	63	–	63	–	63
Loans	476,827	476,827	–	247,109	33,353	280,462
Other assets subject to credit risk ^{4,5}	83,313	79,669 ⁶	30,639	709	206	31,555
Total financial assets at amortized cost³	767,942	764,298	30,639	255,951	33,559	320,149
Financial assets at fair value through profit or loss ⁶						
Trading assets	97,080	–	–	2,217	1,091	3,308
Positive market values from derivative financial instruments	299,732	–	238,412	41,692	37	280,140
Non-trading financial assets mandatory at fair value through profit or loss	87,873	–	2,176	75,960	187	78,324
Of which:						
Securities purchased under resale agreement	59,931	–	2,176	57,755	0	59,931
Securities borrowed	18,355	–	–	17,978	0	17,978
Loans	895	–	–	190	187	378
Financial assets designated at fair value through profit or loss	140	–	–	0	82	82
Total financial assets at fair value through profit or loss	484,825	–	240,588	119,869	1,398	361,854
Financial assets at fair value through OCI	28,979	28,979	0	2,097 ⁸	891	2,988
Of which:						
Securities purchased under resale agreement	1,231	1,231	–	1,186 ⁸	0	1,186
Securities borrowed	0	0	–	0	0	0
Loans	4,370	4,370	–	20 ⁸	891	911
Total financial assets at fair value through OCI	28,979	28,979	–	2,097	891	2,988
Financial guarantees and other credit related contingent liabilities ⁷	59,394	59,394	–	3,077	6,857	9,934
Revocable and irrevocable lending commitments and other credit related commitments ⁷	234,432 ⁸	233,754 ⁸	–	18,545	5,888	24,433
Total off-balance sheet	293,825	293,148	–	21,622	12,746	34,368
Maximum exposure to credit risk	1,575,572	1,086,425	271,227	399,538	48,593	719,359

¹ Does not include credit derivative notional sold (€ 491,407 million) and credit derivative notional bought protection

² Bought Credit protection is reflected with the notional of the underlying

³ All amounts at gross value before deductions of allowance for credit losses

⁴ All amounts at amortized cost (gross) except for qualifying hedge derivatives, which are reflected at Fair value through P&L

⁵ Includes Asset Held for Sale regardless of accounting classification

⁶ Excludes equities, other equity interests and commodities

⁷ Figures are reflected at notional amounts

⁸ Prior year's comparatives aligned to presentation in the current year

The overall increase in maximum exposure to credit risk for December 31, 2022, was € 45.2 billion mainly driven by an increase of € 19.2 billion in loans at amortized cost, € 15.0 billion in other assets subject to credit risk, € 7.0 billion in central bank funds sold, securities purchased under resale agreements and securities borrowed across all applicable measurement categories and € 24.4 billion in irrevocable commitments and financial guarantees. These increases were partly offset by reductions in cash and central bank and interbank balances by € 13.3 billion and trading assets by € 6.9 billion.

Trading assets as of December 31, 2022, includes traded bonds of € 80.2 billion (€ 85.5 billion as of December 31, 2021) of which over 83 % were investment-grade (over 83 % as of December 31, 2021).

Credit Enhancements are split into three categories: netting, collateral and guarantees / credit derivatives. Haircuts, parameter setting for regular margin calls as well as expert judgments for collateral valuation are employed to prevent market developments from leading to a build-up of uncollateralized exposures. All categories are monitored and reviewed regularly. Overall credit enhancements received are diversified and of adequate quality being largely cash, highly rated government bonds and third-party guarantees mostly from well rated banks and insurance companies. These financial institutions are domiciled mainly in European countries and the United States. Furthermore, the bank has collateral pools of highly liquid assets and mortgages (principally consisting of residential properties mainly in Germany) for the homogeneous retail portfolio.

Main Credit Exposure Categories

The tables in this section show details about several of Deutsche Bank's main credit exposure categories, namely Loans, Revocable and Irrevocable Lending Commitments, Contingent Liabilities Over-The-Counter ("OTC") Derivatives, Debt Securities and Repo and repo-style transactions:

- "Loans" are gross loans as reported on our balance sheet at amortized cost, loans at fair value through profit and loss and loans at fair value through other comprehensive income before deduction of allowance for credit losses. This includes "Traded loans" that are bought and held for the purpose of selling them in the near term, or the material risks of which have all been hedged or sold. From a regulatory perspective the latter category principally covers trading book positions.
- "Revocable and irrevocable lending commitments" consist of the undrawn portion of revocable and irrevocable lending-related commitments.
- "Contingent liabilities" consist of financial and performance guarantees, standby letters of credit and other similar arrangements (mainly indemnity agreements).
- "OTC derivatives" are the bank's credit exposures from over-the-counter derivative transactions that the Group has entered into, after netting and cash collateral received. On the bank's balance sheet, these are included in financial assets at fair value through profit or loss or, for derivatives qualifying for hedge accounting, in other assets, in either case only applying cash collateral received and netting eligible under IFRS.
- "Debt securities" include debentures, bonds, deposits, notes or commercial paper, which are issued for a fixed term and redeemable by the issuer, as reported on our balance sheet within accounting categories at amortized cost and at fair value through other comprehensive income before deduction of allowance for credit losses, it also includes category at fair value through profit and loss. This includes "Traded bonds", which are bonds, deposits, notes or commercial paper that are bought and held for the purpose of selling them in the near term. From a regulatory perspective the latter category principally covers trading book positions.
- "Repo and repo-style transactions" consist of reverse repurchase transactions, as well as securities or commodities borrowing transactions, only applying collateral received and netting eligible under IFRS.

Although considered in the monitoring of maximum credit exposures, the following are not included in the details of the Group's main credit exposure: brokerage and securities related receivables, cash and central bank balances, interbank balances (without central banks), assets held for sale, accrued interest receivables, traditional securitization positions.

Unless stated otherwise, the tables below reflect credit exposure before the consideration of collateral and risk mitigation or structural enhancements, except for OTC derivatives wherein they are post credit enhancements.

Main Credit Exposure Categories by Business Divisions

Dec 31, 2022							
in € m.	Loans				Off-balance sheet		OTC derivatives
	at amortized cost ¹	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI ²	Revocable and irrevocable lending commitments ³	Contingent liabilities	at fair value through P&L ⁴
Corporate Bank	121,543	497	312	3,797	155,299	61,134	72
Investment Bank	103,072	7,198	883	272	51,299	3,515	24,353
Private Bank	264,893	7	7	0	43,737	2,503	388
Asset Management	23	0	0	0	92	9	0
Capital Release Unit	1,753	253	3	0	39	25	3,767
Corporate & Other	4,694	0	0	0	555	27	387
Total	495,979	7,955	1,205	4,069	251,021	67,214	28,967

Dec 31, 2022							
in € m.	Debt Securities			Repo and repo-style transactions ⁷			Total
	at amortized cost ⁵	at fair value through P&L	at fair value through OCI ⁶	at amortized cost	at fair value through P&L	at fair value through OCI	
Corporate Bank	617	12	0	1,042	0	0	344,326
Investment Bank	4,800	82,947	1,606	10,437	74,662	0	365,045
Private Bank	804	3	2	0	0	0	312,345
Asset Management	0	3,728	80	0	0	0	3,932
Capital Release Unit	0	141	0	0	103	0	6,083
Corporate & Other	19,375	1,193	23,763	0	6,504	2,156	58,655
Total	25,596	88,025	25,450	11,479	81,270	2,156	1,090,386

¹ Includes stage 3 and stage 3 POCI loans at amortized cost amounting to € 12.2 billion as of December 31, 2022

² Includes stage 3 and stage 3 POCI loans at fair value through OCI amounting to € 54.9 million as of December 31, 2022

³ Includes stage 3 and stage 3 POCI off-balance sheet exposure amounting to € 2.6 billion as of December 31, 2022

⁴ Includes the effect of netting agreements and cash collateral received where applicable. Excludes derivatives qualifying for hedge accounting

⁵ Includes stage 3 and stage 3 POCI debt securities at amortized cost amounting to € 327.6 million as of December 31, 2022

⁶ Includes stage 3 and stage 3 POCI debt securities at fair value through OCI amounting to € 15.1 million as of December 31, 2022

⁷ Before reflection of collateral and limited to securities purchased under resale agreements and securities borrowed

	Dec 31, 2021						
	Loans				Off-balance sheet		OTC derivatives
in € m.	at amortized cost ¹	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI ²	Revocable and irrevocable lending commitments ³	Contingent liabilities	at fair value through P&L ⁴
Corporate Bank	122,310	255	311	4,169	143,244 ⁸	55,560	190
Investment Bank	92,966	8,590	702	202	50,768	1,764	17,416
Private Bank	254,439	0	7	0	39,660	1,883	524
Asset Management	23	0	1	0	110	9	0
Capital Release Unit	2,222	344	15	0	41	31	5,813
Corporate & Other	4,867	0	0	0	608	146	203
Total	476,827	9,189	1,035	4,370	234,432	59,394	24,146

	Dec 31, 2021						
	Debt Securities			Repo and repo-style transactions ⁷			Total
in € m.	at amortized cost ⁵	at fair value through P&L	at fair value through OCI ⁶	at amortized cost	at fair value through P&L	at fair value through OCI	
Corporate Bank	839	15	0	862	0	0	327,753
Investment Bank	3,332	88,692	1,045	6,692	74,441	0	346,609
Private Bank	525	1	2	0	0	0	297,041
Asset Management	0	3,582	154	0	0	0	3,879
Capital Release Unit	0	625	0	0	3,397	0	12,489
Corporate & Other	10,154	2,452	22,177	879	448	1,231	43,166
Total	14,849	95,367	23,377	8,433	78,286	1,231	1,030,937

¹ Includes stage 3 and stage 3 POCI loans at amortized cost amounting to € 12.4 billion as of December 31, 2021

² Includes stage 3 and stage 3 POCI loans at fair value through OCI amounting to € 28.1 million as of December 31, 2021

³ Includes stage 3 and stage 3 POCI off-balance sheet exposure amounting to € 2.6 billion as of December 31, 2021

⁴ Includes the effect of netting agreements and cash collateral received where applicable. Excludes derivatives qualifying for hedge accounting

⁵ Includes stage 3 and stage 3 POCI debt securities at amortized cost amounting to € 368.2 million as of December 31, 2021

⁶ Includes stage 3 and stage 3 POCI debt securities at fair value through OCI amounting to € 15.8 million as of December 31, 2021

⁷ Before reflection of collateral and limited to securities purchased under resale agreements and securities borrowed

⁸ Prior year's comparatives aligned to presentation in the current year

Deutsche Bank's total main credit exposure increased by € 59.4 billion year-on-year.

- In terms of business divisions, total main credit exposure increased by € 18.4 billion in the Investment Bank, € 16.6 billion in the Corporate Bank, € 15.5 billion in Corporate & Other and € 15.3 billion in the Private Bank, partially offset by decrease in Capital Release Unit of € 6.4 billion. The business division Corporate & Other primarily contains exposures in Treasury.
- From a product perspective, exposure increases have been observed for all the products included in main credit exposures by business division.

Main Credit Exposure Categories by Industry Sectors

The below tables give an overview of the bank's credit exposure by industry based on the NACE code of the counterparty. NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) is a standard European industry classification system and does not have to be congruent with an internal risk based view applied elsewhere in this report.

	Dec 31, 2022						
	Loans				Off-balance sheet		OTC derivatives
in € m.	at amortized cost ¹	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI ²	Revocable and irrevocable lending commitments ³	Contingent liabilities	at fair value through P&L ⁴
Agriculture, forestry and fishing	524	2	0	0	275	17	2
Mining and quarrying	2,392	248	40	0	5,636	2,644	41
Manufacturing	30,534	380	7	1,431	58,584	13,053	1,863
Electricity, gas, steam and air conditioning supply	4,893	107	75	28	6,479	3,779	145
Water supply, sewerage, waste management and remediation activities	725	0	0	0	457	158	245
Construction	4,239	233	0	21	3,198	2,927	75
Wholesale and retail trade, repair of motor vehicles and motorcycles	21,535	224	39	806	16,947	6,795	570
Transport and storage	5,547	409	22	90	6,254	1,061	170
Accommodation and food service activities	1,965	7	0	0	1,137	110	14
Information and communication	7,002	489	62	231	14,567	3,317	960
Financial and insurance activities ⁸	116,558	3,186	620	969	74,787	28,173	22,881
Real estate activities ⁹	47,973	1,556	101	41	7,251	192	452
Professional, scientific and technical activities	7,013	124	0	0	5,070	2,309	108
Administrative and support service activities	7,470	199	192	62	5,101	1,062	413
Public administration and defense, compulsory social security	5,287	552	10	128	6,767	60	398
Education	249	0	0	0	125	53	169
Human health services and social work activities	4,523	31	0	0	1,898	146	36
Arts, entertainment and recreation	1,128	1	0	50	1,507	106	83
Other service activities	5,324	206	39	210	4,037	793	68
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	221,098	0	0	1	30,943	455	189
Activities of extraterritorial organizations and bodies	1	0	0	0	0	2	85
Total	495,979	7,955	1,205	4,069	251,021	67,214	28,967

	Dec 31, 2022						
	Debt Securities			Repo and repo-style transactions ⁷			Total
in € m.	at amortized cost ⁵	at fair value through P&L	at fair value through OCI ⁶	at amortized cost	at fair value through P&L	at fair value through OCI	
Agriculture, forestry and fishing	0	8	0	0	0	0	828
Mining and quarrying	34	362	2	0	0	0	11,398
Manufacturing	64	983	41	0	0	0	106,939
Electricity, gas, steam and air conditioning supply	78	732	35	1,515	0	0	17,867
Water supply, sewerage, waste management and remediation activities	0	23	0	0	0	0	1,609
Construction	29	621	1	0	0	0	11,344
Wholesale and retail trade, repair of motor vehicles and motorcycles	0	357	2	0	0	0	47,275
Transport and storage	117	537	14	0	0	0	14,220
Accommodation and food service activities	0	26	0	0	0	0	3,259
Information and communication	108	579	2	0	0	0	27,317
Financial and insurance activities ⁸	4,669	18,440	4,421	9,965	75,497	2,156	362,322
Real estate activities ⁹	405	1,703	548	0	0	0	60,222
Professional, scientific and technical activities	27	206	115	0	0	0	14,973
Administrative and support service activities	39	268	5	0	0	0	14,811
Public administration and defense, compulsory social security	19,782	59,291	19,991	0	5,768	0	118,034
Education	0	113	17	0	0	0	727
Human health services and social work activities	88	49	12	0	0	0	6,783
Arts, entertainment and recreation	0	125	0	0	0	0	3,001
Other service activities	115	2,636	18	0	4	0	13,449
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	0	0	0	0	0	0	252,687
Activities of extraterritorial organizations and bodies	40	964	229	0	0	0	1,322
Total	25,596	88,025	25,450	11,479	81,270	2,156	1,090,386

¹ Includes stage 3 and stage 3 POCI loans at amortized cost amounting to € 12.2 billion as of December 31, 2022

² Includes stage 3 and stage 3 POCI loans at fair value through OCI amounting to € 54.9 million as of December 31, 2022

³ Includes stage 3 and stage 3 POCI off-balance sheet exposure amounting to € 2.6 billion as of December 31, 2022

⁴ Includes the effect of netting agreements and cash collateral received where applicable. Excludes derivatives qualifying for hedge accounting

⁵ Includes stage 3 and stage 3 POCI debt securities at amortized cost amounting to € 327.6 million as of December 31, 2022

⁶ Includes stage 3 and stage 3 POCI debt securities at fair value through OCI amounting to € 15.1 million as of December 31, 2022

⁷ Before reflection of collateral and limited to securities purchased under resale agreements and securities borrowed

⁸ Includes exposure to Corporates including Holding Companies of € 85 billion, Asset-Backed Securities of € 43 billion, Banks of € 54 billion, Insurance of € 15 billion, Financial Intermediaries of € 22 billion and Public Sector of € 13 billion, all based on internal client classification

⁹ Non-recourse Commercial Real Estate 'focus' portfolio is € 33 billion

	Dec 31, 2021						
	Loans				Off-balance sheet		OTC derivatives
in € m.	at amortized cost ¹	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI ²	Revocable and irrevocable lending commitments ³	Contingent liabilities	at fair value through P&L ⁴
Agriculture, forestry and fishing	645	2	0	0	593	36	3
Mining and quarrying	2,783	190	0	33	5,220	1,893	32
Manufacturing	35,404	348	26	1,042	51,706	11,612	5,034
Electricity, gas, steam and air conditioning supply	4,548	226	46	0	5,068	2,807	360
Water supply, sewerage, waste management and remediation activities	681	0	0	0	484	175	67
Construction	4,374	234	2	40	2,939	2,714	256
Wholesale and retail trade, repair of motor vehicles and motorcycles	21,285	196	34	930	16,368	7,135	298
Transport and storage	5,330	334	87	316	5,729	947	515
Accommodation and food service activities	2,259	5	0	8	1,308	136	7
Information and communication	6,363	286	80	658	13,837	2,896	924
Financial and insurance activities ⁸	106,343	3,219	578	1,099	68,414 ¹⁰	24,361	13,369
Real estate activities ⁹	40,629	2,478	30	83	6,486	208	822
Professional, scientific and technical activities	6,959	63	0	0	5,245	2,147	85
Administrative and support service activities	9,759	472	71	22	5,114	816	496
Public administration and defense, compulsory social security	6,183	757	12	124	6,519 ¹⁰	105	1,037
Education	225	0	0	0	132	56	255
Human health services and social work activities	3,869	111	25	0	1,646	141	157
Arts, entertainment and recreation	1,062	6	0	0	1,899	88	56
Other service activities	4,941	262	44	14	4,790	810	91
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	213,184	0	0	1	30,934	311	253
Activities of extraterritorial organizations and bodies	1	0	0	0	0	2	31
Total	476,827	9,189	1,035	4,370	234,432	59,394	24,146

	Dec 31, 2021						
	Debt Securities			Repo and repo-style transactions ⁷			Total
in € m.	at amortized cost ⁵	at fair value through P&L	at fair value through OCI ⁶	at amortized cost	at fair value through P&L	at fair value through OCI	
Agriculture, forestry and fishing	0	12	0	0	0	0	1,291
Mining and quarrying	4	371	2	0	0	0	10,529
Manufacturing	4	1,746	37	0	0	0	106,960
Electricity, gas, steam and air conditioning supply	15	601	1	0	0	0	13,669
Water supply, sewerage, waste management and remediation activities	0	22	0	0	0	0	1,429
Construction	60	456	10	0	0	0	11,086
Wholesale and retail trade, repair of motor vehicles and motorcycles	6	335	2	0	0	0	46,589
Transport and storage	306	888	1	0	0	0	14,452
Accommodation and food service activities	0	91	0	0	0	0	3,814
Information and communication	78	1,007	9	0	0	0	26,137
Financial and insurance activities ⁸	3,542	18,588	4,511	8,428	76,317	1,231	330,001
Real estate activities ⁹	381	2,405	129	0	0	0	53,650
Professional, scientific and technical activities	28	176	157	0	0	0	14,860
Administrative and support service activities	27	323	3	0	0	0	17,103
Public administration and defense, compulsory social security	10,185	63,108	18,216	0	1,957	0	108,203
Education	0	275	0	0	0	0	942
Human health services and social work activities	0	468	0	0	0	0	6,417
Arts, entertainment and recreation	0	131	0	0	0	0	3,241
Other service activities	174	2,693	14	5	12	0	13,849
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	0	0	0	0	0	0	244,683
Activities of extraterritorial organizations and bodies	40	1,671	287	0	0	0	2,032
Total	14,849	95,367	23,377	8,433	78,286	1,231	1,030,937

¹ Includes stage 3 and stage 3 POCI loans at amortized cost amounting to € 12.4 billion as of December 31, 2021

² Includes stage 3 and stage 3 POCI loans at fair value through OCI amounting to € 28.1 million as of December 31, 2021

³ Includes stage 3 and stage 3 POCI off-balance sheet exposure amounting to € 2.6 billion as of December 31, 2021

⁴ Includes the effect of netting agreements and cash collateral received where applicable. Excludes derivatives qualifying for hedge accounting

⁵ Includes stage 3 and stage 3 POCI debt securities at amortized cost amounting to € 368.2 million as of December 31, 2021

⁶ Includes stage 3 and stage 3 POCI debt securities at fair value through OCI amounting to € 15.8 million as of December 31, 2021

⁷ Before reflection of collateral and limited to securities purchased under resale agreements and securities borrowed

⁸ Includes exposure to Corporates including Holding Companies of € 79 billion, Asset-Backed Securities of € 37 billion, Banks of € 49 billion, Insurance of € 11 billion, Financial Intermediaries of € 23 billion and Public Sector of € 11 billion, all based on internal client classification

⁹ Non-recourse Commercial Real Estate 'focus' portfolio is € 31 billion

¹⁰ Prior year's comparatives aligned to presentation in the current year

The portfolio is subject to the same credit underwriting requirements stipulated in the bank's "Principles for Managing Credit Risk", including various controls according to single name, country, industry and product/asset class-specific concentration.

Material transactions, such as loans underwritten with the intention to sell down or distribute part of the risk to third parties, are subject to review and approval by senior credit risk management professionals and (depending upon size) an underwriting committee and/or the Management Board. High emphasis is placed on structuring and pricing such transactions so that de-risking can be achieved in a timely manner and – where Deutsche Bank takes market price risk – to mitigate such market risk.

The Group's amortized cost loan exposure within above categories is mostly to good quality borrowers. Moreover, with the focus on the Corporate Bank and Investment Bank, loan exposure is subject to further risk mitigation through the bank's e.g. Strategic Corporate Lending unit.

Deutsche Bank's household loan exposure is principally associated with Private Bank portfolios.

The bank's amortized cost loan exposure of € 48.0 billion to Real Estate activities above is based on NACE code classification. The Commercial Real Estate ("CRE") 'focus' portfolio of € 33 billion is included in the bank's loan portfolio and is comprised of non-recourse CRE lending in the core CRE business units within the Investment Bank and Corporate Bank.

The Group's commercial real estate loans, primarily originated in the U.S. and Europe, are generally secured by first mortgages on the underlying real estate property. Deutsche Bank originates fixed and floating rate loans and selectively acquires (generally at substantial discount) sub- /non-performing loans sold by financial institutions. The underwriting process is stringent and the exposure is managed under separate portfolio limits. Credit underwriting policy guidelines provide that LTV ratios of generally less than 75 % are adhered to at loan origination. Additionally, given the significance of the underlying collateral, independent external appraisals are commissioned for all secured loans by a valuation team (part of the independent Credit Risk Management function) which is also responsible for reviewing and challenging the reported real estate values regularly. Deutsche Bank originates loans for distribution in the banking market or via securitization. In this context Deutsche Bank frequently retains a portion of the syndicated loans while securitized positions may be entirely sold (except where regulation requires retention of economic risk). Mezzanine or other junior tranches of debt are retained only in exceptional cases. The bank also participates in conservatively underwritten unsecured lines of credit to well-capitalized real estate investment trusts and other real estate operating companies.

Commercial real estate property valuations and rental incomes can be significantly impacted by macro-economic conditions and idiosyncratic events affecting the underlying properties. Accordingly, the portfolio is categorized as higher risk and hence subject to the aforementioned tight restrictions on concentration.

The Group's credit exposure to the ten largest counterparties accounted for 11 % of the bank's aggregated total credit exposure in these categories as of December 31, 2022, compared with 8 % as of December 31, 2021. The top ten counterparty exposures were well-rated counterparties or otherwise related to structured trades which show high levels of risk mitigation.

Deutsche Bank's exposure to Financial and Insurance Activities is € 362.3 billion as of December 31, 2022 which also includes exposures to Asset Backed Securities, Banks, Insurance, Financial intermediaries, Public Sector as well as to Corporates including Holding Companies. Exposures are managed using bespoke risk management frameworks, trade-by-trade approvals and relevant risk appetite metrics.

Total loans across all applicable measurement categories amounted to € 121.3 billion, total repo and repo style transactions across all applicable measurement categories amounted to € 87.6 billion and off-balance sheet activities amounted to € 103.0 billion as of December 31, 2022 and were principally associated with Investment Bank and Corporate Bank portfolios, which were majorly held in North America and Europe.

Main credit exposure categories by geographical region

Dec 31, 2022							
	Loans				Off-balance sheet		OTC derivatives
in € m.	at amortized cost ¹	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI ²	Revocable and irrevocable lending commitments ³	Contingent liabilities	at fair value through P&L ⁴
Europe	346,395	2,647	724	1,708	142,035	41,773	19,294
Of which:							
Germany	242,180	444	42	462	80,857	16,364	4,872
United Kingdom	7,937	184	229	329	9,759	4,067	6,673
France	3,696	99	75	70	7,264	2,095	1,364
Luxembourg	15,472	400	67	124	7,525	747	855
Italy	24,578	145	8	25	3,709	5,354	291
Netherlands	9,009	165	45	200	8,279	2,519	1,404
Spain	17,429	326	8	107	3,460	4,037	503
Ireland	5,234	125	234	129	3,234	266	565
Switzerland	6,772	32	0	117	7,277	2,897	294
Poland	2,324	0	0	26	758	190	7
Belgium	1,532	12	0	77	1,730	571	193
Russian Federation ⁸	537	18	0	41	75	64	0
Ukraine ⁸	44	270 ⁹	0	0	3	5	0
Other Europe ⁸	9,650	428	16	0	8,105	2,598	2,274
North America	101,736	2,998	350	1,687	98,137	11,766	5,542
Of which:							
U.S.	87,794	2,713	290	1,520	92,551	10,585	4,485
Cayman Islands	5,202	103	4	23	2,026	445	419
Canada	1,919	78	2	118	1,884	463	372
Other North America	6,821	104	54	25	1,676	274	266
Asia/Pacific	39,502	1,517	109	602	9,268	12,507	3,910
Of which:							
Japan	1,349	120	46	22	589	487	374
Australia	2,964	196	0	0	2,478	769	259
India	7,861	27	3	23	1,154	3,408	179
China	4,189	3	12	3	407	1,583	591
Singapore	5,402	390	22	164	1,408	1,258	277
Hong Kong	2,525	84	0	40	695	846	357
Other Asia/Pacific	15,213	698	25	351	2,537	4,154	1,873
Other geographical areas	8,346	793	22	72	1,580	1,168	222
Total	495,979	7,955	1,205	4,069	251,021	67,214	28,967

	Dec 31, 2022						
	Debt Securities			Repo and repo-style transactions ⁷			Total
in € m.	at amortized cost ⁵	at fair value through P&L	at fair value through OCI ⁶	at amortized cost	at fair value through P&L	at fair value through OCI	
Europe	10,218	40,948	7,321	4,912	26,494	418	644,886
Of which:							
Germany	701	7,968	672	1,795	3,035	12	359,403
United Kingdom	1,212	8,399	708	585	8,519	0	48,598
France	0	6,161	870	6	7,337	0	29,038
Luxembourg	0	1,816	702	0	549	0	28,257
Italy	4,868	3,570	953	200	480	0	44,180
Netherlands	0	2,057	24	177	212	0	24,091
Spain	1,486	3,390	1	1,485	24	0	32,256
Ireland	1,270	1,543	4	0	1,346	0	13,948
Switzerland	0	491	2	0	215	0	18,096
Poland	0	113	2,944	0	149	0	6,511
Belgium	40	2,271	342	0	1	0	6,769
Russian Federation ⁸	0	15	0	0	0	0	750
Ukraine ⁹	0	17	0	0	0	0	339
Other Europe ⁹	643	3,139	99	664	4,628	406	32,651
North America	12,359	24,416	14,616	4,365	43,893	0	321,863
Of which:							
U.S.	12,340	23,644	14,359	976	21,484	0	272,741
Cayman Islands	0	276	0	3,389	17,904	0	29,790
Canada	0	350	180	0	4,494	0	9,859
Other North America	19	146	77	0	11	0	9,473
Asia/Pacific	2,878	19,347	3,344	2,126	10,652	1,301	107,063
Of which:							
Japan	25	2,759	481	284	6,374	0	12,909
Australia	1,989	1,328	315	0	946	0	11,243
India	481	4,856	49	0	6	1,012	19,058
China	0	1,384	209	0	292	0	8,675
Singapore	0	847	159	0	210	0	10,136
Hong Kong	186	559	254	0	64	0	5,611
Other Asia/Pacific	196	7,613	1,877	1,842	2,761	290	39,430
Other geographical areas	141	3,314	170	77	232	437	16,573
Total	25,596	88,025	25,450	11,479	81,270	2,156	1,090,386

¹ Includes stage 3 and stage 3 POCI loans at amortized cost amounting to € 12.2 billion as of December 31, 2022

² Includes stage 3 and stage 3 POCI loans at fair value through OCI amounting to € 54.9 million as of December 31, 2022

³ Includes stage 3 and stage 3 POCI off-balance sheet exposure amounting to € 2.6 billion as of December 31, 2022

⁴ Includes the effect of netting agreements and cash collateral received where applicable. Excludes derivatives qualifying for hedge accounting

⁵ Includes stage 3 and stage 3 POCI debt securities at amortized cost amounting to € 327.6 million as of December 31, 2022

⁶ Includes stage 3 and stage 3 POCI debt securities at fair value through OCI amounting to € 15.1 million as of December 31, 2022

⁷ Before reflection of collateral and limited to securities purchased under resale agreements and securities borrowed

⁸ Thematic addition on back of the ongoing border conflict between the Russian Federation and Ukraine

⁹ Ukraine trading loan exposure driven by financing, materially guaranteed by supranational development bank. Net exposure considering broader risk mitigation structure is de minimis

Dec 31, 2021							
in € m.	Loans				Off-balance sheet		OTC derivatives
	at amortized cost ¹	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI ²	Revocable and irrevocable lending commitments ³	Contingent liabilities	at fair value through P&L ⁴
Europe	342,179	3,411	702	1,365	136,446	35,814	13,525
Of which:							
Germany	236,139	407	20	173	79,787 ¹⁰	14,388	1,535
United Kingdom	6,331	529	243	297	8,851	2,796	4,480
France	3,581	59	2	55	6,840	2,179	925
Luxembourg	14,195	517	82	53	7,743 ¹⁰	713	646
Italy	24,316	227	9	0	3,484	4,510	398
Netherlands	9,383	137	102	384	8,391	2,237	1,226
Spain	16,283	246	0	43	3,215	3,464	668
Ireland	4,652	262	234	72	2,687	210	549
Switzerland	13,083	34	0	110	6,156	2,710	145
Poland	2,293	0	0	16	401	116	14
Belgium	1,426	5	0	76	1,724	578	212
Russian Federation ⁸	806	54	0	51	629	209	27
Ukraine ⁸	109	441 ⁹	0	0	3	22	0
Other Europe ^{8 11}	9,583	492	10	37	6,535	1,683	2,700
North America	87,628	3,904	132	2,060	87,422	9,411	7,853
Of which:							
U.S.	73,007	3,156	91	1,836	83,050 ¹⁰	8,685	6,839
Cayman Islands	5,709	157	3	0	1,555	80	396
Canada	935	291	0	200	1,977	419	218
Other North America	7,976	301	37	24	839	227	401
Asia/Pacific	40,093	944	185	874	9,151	12,786	2,605
Of which:							
Japan	1,921	62	108	48	608	519	656
Australia	2,112	264	25	0	2,248	532	257
India	7,948	4	6	18	920	3,440	95
China	5,606	9	0	42	480	1,913	554
Singapore	5,750	127	23	135	1,157	1,566	157
Hong Kong	3,146	89	0	51	1,258	752	181
Other Asia/Pacific	13,610	390	23	581	2,480	4,064	706
Other geographical areas	6,926	931	16	71	1,414	1,383	163
Total	476,827	9,189	1,035	4,370	234,432	59,394	24,146

	Dec 31, 2021						
	Debt Securities			Repo and repo-style transactions ⁷			Total
in € m.	at amortized cost ⁵	at fair value through P&L	at fair value through OCI ⁶	at amortized cost	at fair value through P&L	at fair value through OCI	
Europe	3,464	45,063	7,578	2,745	32,525	484	625,300
Of which:							
Germany	548	7,152	932	274	3,301	32	344,687
United Kingdom	951	8,604	1,151	571	8,824	0	43,628
France	0	6,482	1,411	5	12,910	0	34,448
Luxembourg	57	2,471	497	0	971	0	27,944
Italy	314	3,655	315	85	729	0	38,042
Netherlands	212	2,157	51	29	38	0	24,347
Spain	74	7,193	199	1,126	500	0	33,012
Ireland	1,143	1,264	3	2	3,158	0	14,237
Switzerland	3	583	4	0	140	0	22,968
Poland	0	73	1,870	0	76	0	4,859
Belgium	33	1,932	805	0	7	0	6,798
Russian Federation ⁸	0	14	36	0	0	0	1,826
Ukraine ⁸	0	2	29	0	0	0	606
Other Europe ^{8 11}	130	3,481	274	653	1,870	452	27,900
North America	8,618	26,899	10,363	2,551	38,688	0	285,528
Of which:							
U.S.	8,600	25,959	10,059	517	26,173	0	247,972
Cayman Islands	0	238	0	2,034	11,679	0	21,851
Canada	0	476	235	0	834	0	5,586
Other North America	18	225	69	0	3	0	10,119
Asia/Pacific	2,718	21,369	5,053	2,868	7,000	508	106,154
Of which:							
Japan	25	2,951	556	0	3,672	0	11,127
Australia	1,597	1,726	510	0	515	0	9,787
India	617	5,067	944	0	253	360	19,670
China	16	1,576	560	0	594	0	11,349
Singapore	9	860	246	0	107	0	10,136
Hong Kong	213	742	246	0	184	0	6,861
Other Asia/Pacific	242	8,447	1,990	2,868	1,675	147	37,224
Other geographical areas	49	2,037	384	268	72	240	13,954
Total	14,849	95,367	23,377	8,433	78,286	1,231	1,030,936

¹ Includes stage 3 and stage 3 POCI loans at amortized cost amounting to € 12.4 billion as of December 31, 2021

² Includes stage 3 and stage 3 POCI loans at fair value through OCI amounting to € 28.1 million as of December 31, 2021

³ Includes stage 3 and stage 3 POCI off-balance sheet exposure amounting to € 2.6 billion as of December 31, 2021

⁴ Includes the effect of netting agreements and cash collateral received where applicable. Excludes derivatives qualifying for hedge accounting

⁵ Includes stage 3 and stage 3 POCI debt securities at amortized cost amounting to € 368.2 million as of December 31, 2021

⁶ Includes stage 3 and stage 3 POCI debt securities at fair value through OCI amounting to € 15.8 million as of December 31, 2021

⁷ Before reflection of collateral and limited to securities purchased under resale agreements and securities borrowed

⁸ Thematic addition on back of the ongoing border conflict between the Russian Federation and Ukraine

⁹ Ukraine trading loan exposure driven by financing, materially guaranteed by supranational development bank. Net exposure considering broader risk mitigation structure is de minimis

¹⁰ Prior year's comparatives aligned to presentation in the current year

¹¹ Other Europe included Belarus with a total exposure of less than € 2 million

The tables above give an overview of Deutsche Bank's credit exposure by geographical region, allocated based on the counterparty's country of domicile. Aforementioned domicile view does not have to be congruent with an internal risk based view applied elsewhere in this report.

The Group's largest concentration of credit risk within loans from a regional perspective is in its home market Germany, with a significant share in households, which includes the majority of the mortgage lending and home loan business.

Within OTC derivatives, tradable assets as well as repo and repo-style transactions, the largest concentrations from a regional perspective were in Europe and North America.

Credit Exposure Classification

Deutsche Bank also classifies its credit exposure along business divisions, which is in line with the divisionally aligned chief risk officer mandates. The section below discloses the credit exposure of the Corporate Bank and the Investment Bank together. The subsequent section provides the credit exposure for the Private Bank.

Corporate Bank and Investment Bank credit exposure

The tables below show the main Corporate Bank and Investment Bank Credit Exposure by product types and internal rating bands. Please refer to section "Measuring Credit Risk" for more details about the bank's internal ratings.

Main Corporate Bank and Investment Bank credit exposure categories according to the bank's internal creditworthiness categories of the counterparties – gross

								Dec 31, 2022
in € m. (unless stated otherwise)								
		Loans			Off-balance sheet		OTC derivatives	
Ratingband	Probability of default in % ¹	at amortized cost	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI	Revocable and irrevocable lending commitments	Contingent liabilities	at fair value through P&L ²
iAAA–iAA	> 0.00 ≤ 0.04	22,753	179	128	137	32,252	6,145	8,138
iA	> 0.04 ≤ 0.11	43,603	344	282	1,481	56,873	28,877	9,535
iBBB	> 0.11 ≤ 0.5	58,909	974	249	1,476	64,674	17,103	4,040
iBB	> 0.5 ≤ 2.27	59,719	2,446	143	744	30,618	7,168	2,179
iB	> 2.27 ≤ 10.22	30,926	2,196	101	141	19,330	3,589	478
iCCC and below	> 10.22 ≤ 100	8,706	1,555	291	89	2,851	1,767	55
Total		224,616	7,694	1,195	4,069	206,598	64,649	24,425

Dec 31, 2022

in € m.
(unless stated otherwise)

Ratingband	Probability of default in % ¹	Debt Securities			Repo and repo-style transactions			Total
		at amortized cost	at fair value through P&L	at fair value through OCI	at amortized cost	at fair value through P&L	at fair value through OCI	
iAAA–iAA	> 0.00 ≤ 0.04	1,565	45,619	150	1,110	33,990	–	152,166
iA	> 0.04 ≤ 0.11	1,850	10,753	217	3,366	14,134	–	171,315
iBBB	> 0.11 ≤ 0.5	661	11,597	75	2,884	9,435	–	172,078
iBB	> 0.5 ≤ 2.27	664	12,999	727	2,714	16,825	–	136,946
iB	> 2.27 ≤ 10.22	347	1,502	421	1,404	279	–	60,714
iCCC and below	> 10.22 ≤ 100	331	489	15	0	0	–	16,150
Total		5,417	82,960	1,606	11,479	74,662	–	709,370

¹ Reflects the probability of default for a one year time horizon

² Includes the effect of netting agreements and cash collateral received where applicable

Main Corporate Bank and Investment Bank credit exposure categories according to the bank's internal creditworthiness categories of the counterparties – net

								Dec 31, 2022 ¹
in € m. (unless stated otherwise)								OTC derivatives
		Loans			Off-balance sheet			
Ratingband	Probability of default in % ²	at amortized cost	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI	Revocable and irrevocable lending commitments	Contingent liabilities	at fair value through P&L
iAAA–iAA	> 0.00 ≤ 0.04	12,790	179	100	24	31,486	4,128	3,414
iA	> 0.04 ≤ 0.11	32,026	87	282	1,354	55,080	26,877	7,069
iBBB	> 0.11 ≤ 0.5	29,648	592	134	1,020	60,166	13,600	2,779
iBB	> 0.5 ≤ 2.27	24,889	1,479	101	538	27,922	5,724	1,831
iB	> 2.27 ≤ 10.22	9,078	1,553	51	132	17,751	2,262	424
iCCC and below	> 10.22 ≤ 100	4,025	1,047	123	89	2,765	984	49
Total		112,456	4,936	791	3,157	195,169	53,576	15,566

Dec 31, 2022¹

in € m.
(unless stated otherwise)

Ratingband	Probability of default in % ²	Debt Securities			Repo and repo-style transactions			Total
		at amortized cost	at fair value through P&L	at fair value through OCI	at amortized cost	at fair value through P&L	at fair value through OCI	
iAAA–iAA	> 0.00 ≤ 0.04	1,565	45,619	150	11	0	–	99,465
iA	> 0.04 ≤ 0.11	1,850	10,753	217	180	47	–	135,823
iBBB	> 0.11 ≤ 0.5	661	11,263	75	0	174	–	120,113
iBB	> 0.5 ≤ 2.27	391	12,687	202	171	1,909	–	77,845
iB	> 2.27 ≤ 10.22	143	922	368	0	0	–	32,682
iCCC and below	> 10.22 ≤ 100	120	394	15	0	0	–	9,611
Total		4,730	81,638	1,028	362	2,130	–	475,539

¹ Net of eligible collateral, guarantees and hedges based on IFRS requirements

² Reflects the probability of default for a one year time horizon

The tables below show the main Corporate Bank and Investment Bank credit exposure for 2021 by product types and internal rating bands.

Main Corporate Bank and Investment Bank credit exposure categories according to the bank's internal creditworthiness categories of the counterparties – gross

								Dec 31, 2021
in € m. (unless stated otherwise)								OTC derivatives
		Loans			Off-balance sheet			
Ratingband	Probability of default in % ¹	at amortized cost	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI	Revocable and irrevoca- ble lending commitments	Contingent liabilities	at fair value through P&L ²
iAAA–iAA	> 0.00 ≤ 0.04	23,066	130	13	159	26,753 ³	3,545	4,008
iA	> 0.04 ≤ 0.11	41,041	138	202	1,151	57,557 ³	27,267	4,503
iBBB	> 0.11 ≤ 0.5	61,562	789	192	1,967	57,300 ³	14,362	2,710
iBB	> 0.5 ≤ 2.27	51,617	4,058	296	857	26,794	6,799	5,923
iB	> 2.27 ≤ 10.22	29,606	2,333	111	207	22,360	3,479	373
iCCC and below	> 10.22 ≤ 100	8,385	1,397	198	29	3,247	1,872	90
Total		215,276	8,845	1,013	4,370	194,011	57,324	17,606

		Dec 31, 2021						
in € m. (unless stated otherwise)		Debt Securities			Repo and repo-style transactions			Total
Ratingband	Probability of default in % ¹	at amortized cost	at fair value through P&L	at fair value through OCI	at amortized cost	at fair value through P&L	at fair value through OCI	
iAAA–iAA	> 0.00 ≤ 0.04	1,253	49,214	0	473	35,615	–	144,229
iA	> 0.04 ≤ 0.11	1,433	11,698	108	1,127	17,831	–	164,056
iBBB	> 0.11 ≤ 0.5	439	11,786	90	2,035	9,144	–	162,378
iBB	> 0.5 ≤ 2.27	265	13,621	225	1,844	11,363	–	123,659
iB	> 2.27 ≤ 10.22	357	1,745	590	1,475	361	–	62,995
iCCC and below	> 10.22 ≤ 100	423	643	32	600	128	–	17,045
Total		4,171	88,707	1,045	7,554	74,441	–	674,362

¹ Reflects the probability of default for a one year time horizon

² Includes the effect of netting agreements and cash collateral received where applicable

³ Prior year's comparatives aligned to presentation in the current year

Main Corporate Bank and Investment Bank credit exposure categories according to the bank's internal creditworthiness categories of the counterparties – net

in € m. (unless stated otherwise)		Dec 31, 2021 ¹						
		Loans				Off-balance sheet		OTC derivatives
Ratingband	Probability of default in % ²	at amortized cost	trading - at fair value through P&L	Designated / mandatory at fair value through P&L	at fair value through OCI	Revocable and irrevocable lending commitments	Contingent liabilities	at fair value through P&L
iAAA–iAA	> 0.00 ≤ 0.04	16,959	130	13	45	25,562 ³	2,664	2,518
iA	> 0.04 ≤ 0.11	31,570	53	202	998	55,421 ³	24,751	3,087
iBBB	> 0.11 ≤ 0.5	32,646	633	89	1,752	54,126 ³	12,207	2,287
iBB	> 0.5 ≤ 2.27	26,315	2,451	208	435	24,316	5,343	5,843
iB	> 2.27 ≤ 10.22	10,221	1,551	45	167	21,138	2,236	370
iCCC and below	> 10.22 ≤ 100	4,336	961	67	29	3,079	1,095	90
Total		122,047	5,779	624	3,427	183,642	48,295	14,195

		Dec 31, 2021 ¹						
in € m. (unless stated otherwise)		Debt Securities			Repo and repo-style transactions			Total
Ratingband	Probability of default in % ²	at amortized cost	at fair value through P&L	at fair value through OCI	at amortized cost	at fair value through P&L	at fair value through OCI	
iAAA–iAA	> 0.00 ≤ 0.04	1,253	49,214	0	16	0	–	98,375
iA	> 0.04 ≤ 0.11	1,433	11,698	108	0	22	–	129,344
iBBB	> 0.11 ≤ 0.5	439	11,773	90	67	22	–	116,130
iBB	> 0.5 ≤ 2.27	260	13,583	225	14	259	–	79,252
iB	> 2.27 ≤ 10.22	334	1,745	590	0	0	–	38,397
iCCC and below	> 10.22 ≤ 100	361	621	32	0	0	–	10,672
Total		4,080	88,635	1,045	97	304	–	472,169

¹ Net of eligible collateral, guarantees and hedges based on IFRS requirements

² Reflects the probability of default for a one year time horizon

³ Prior year's comparatives aligned to presentation in the current year

The above tables show an overall increase in the Corporate Bank and Investment Bank gross exposure in 2022 of € 35.0 billion or 5%. Loans at amortized cost increased by € 9.3 billion mainly driven by growth across businesses. Off-balance sheet positions increased by € 19.9 billion mainly driven by new commitments and guarantees issued during the period. OTC derivatives increased by € 6.8 billion mainly in interest rate products and Repo and repo-style transactions increased by € 4.1 billion in Investment Bank. From a regional perspective, the increase was primarily attributable to counterparties domiciled in the United States, Germany and United Kingdom. These increases were partly offset by a decrease in Debt securities of € 3.9 billion due to reduction in long bond inventory position.

The Group uses risk mitigation techniques as described above to optimize Corporate Bank and Investment Bank credit exposures and reduce potential credit losses. The tables for “net” exposure disclose the development of the bank’s Corporate Bank and Investment Bank credit exposures net of collateral, guarantees and hedges.

Risk Mitigation for Credit Exposure

Strategic Corporate Lending (“SCL”) unit helps mitigate the risk of the bank’s corporate credit exposures. The notional amount of SCL’s risk reduction activities increased from € 31.7 billion as of December 31, 2021, to € 33.9 billion as of December 31, 2022, mainly driven by new issuance activity in Origination & Advisory business.

As of year-end 2022, SCL mitigated the credit risk of € 27.5 billion of loans and lending-related commitments, through synthetic collateralized loan obligations supported predominantly by financial guarantees. This position totaled € 27.0 billion as of December 31, 2021.

SCL also held credit derivatives with an underlying notional amount of € 6.4 billion as of December 31, 2022. The position totaled € 4.7 billion as of December 31, 2021. The credit derivatives used for the bank’s portfolio management activities are accounted for at fair value.

The bank makes use of hedging also in other businesses to reduce single name concentration risks and utilises private risk insurance and export credit agency cover to manage noncollateralized exposures.

Private Bank credit exposure

Private Bank credit exposure, credit exposure stage 3 and net credit costs

	Total exposure in € m.		of which loan book in € m.		Credit exposure stage 3 in € m.		Net credit costs as a % of total exposure ¹	
	Dec 31, 2022	Dec 31, 2021	Dec 31, 2022	Dec 31, 2021	Dec 31, 2022	Dec 31, 2021	Dec 31, 2022	Dec 31, 2021
PB Germany	198,102	194,486	174,611	169,639	2,632	2,668	0.11%	0.12%
Consumer Finance	29,529	29,638	15,594	15,360	1,373	1,446	0.80%	0.77%
Mortgage	163,611	159,825	155,249	150,082	1,163	1,187	(0.01%)	0.00%
Business Finance	1,292	1,310	898	905	6	7	0.04%	0.07%
Other	3,670	3,713	2,870	3,291	90	27	0.00%	0.01%
International Private								
Bank	114,243	102,556	90,283	84,800	3,401	4,037	0.32%	0.21%
Consumer Finance	10,972	11,007	8,894	8,940	378	435	1.11%	0.71%
Mortgage	12,133	12,950	12,033	12,889	431	701	(0.05%)	0.21%
Business Finance	15,130	13,226	12,898	11,320	1,048	968	0.76%	0.83%
Wealth								
Management	75,214	64,553	56,425	51,570	1,543	1,933	0.17%	0.00%
Other	794	819	33	81	0	0	0.02%	(0.01%)
Total	312,345	297,041	264,893	254,439	6,033	6,705	0.19%	0.15%

¹ Net credit costs for the twelve months period ended at the respective balance sheet date divided by the total exposure at that balance sheet date.

Consumer Finance is divided into personal instalment loans, credit lines and credit cards. Consumer Finance business is uncollateralized, loan risk depends on client quality. Various lending requirements are stipulated, including (but not limited to) client rating, maximum loan amounts and maximum tenors, and are adapted to regional conditions and/or circumstances of the borrower (i.e., for consumer loans a maximum loan amount taking into account customer net income). Given the largely homogeneous nature of this portfolio, counterparty credit-worthiness and ratings are predominately derived by utilizing an automated decision engine.

Mortgage business is the financing of residential properties (primarily owner-occupied) sold by various business channels in Europe, primarily in Germany but also in Spain and Italy. The level of credit risk of the mortgage loan portfolio is determined by assessing the quality of the client and the underlying collateral. The loan amounts are generally larger than Consumer Finance loans and they are extended for longer time horizons. Based on the bank’s underwriting criteria and processes and the diversified portfolio (customers/properties) with respective collateralization, the mortgage portfolio is categorized as lower risk, while consumer finance is categorized as high risk.

Business Finance represents credit products for small businesses, SME up to large corporates. Products range from current accounts and credit lines to investment loans or revolving facilities, factoring, leasing and derivatives. Clients are located primarily in Italy and Spain, but credit can also be extended to subsidiaries abroad, mostly in Europe.

Wealth Management offers customized wealth management solutions and private banking services including discretionary portfolio management and traditional and alternative investment solutions, complemented by structured risk management, wealth planning, lending and family office services for wealth, high-net-worth (HNW) and ultra-high-net-worth (UHNW) individuals and family offices. Wealth Management's total exposure is divided into Lombard Lending (against readily marketable liquid collateral / securities) and Structured Lending (against less liquid collateral). While the level of credit risk for the Lombard portfolio is determined by assessing the quality of the underlying collateral, the level of credit risk for the structured portfolio is determined by assessing both the quality of the client and the collateral. Products range from secured Lombard and mortgage loans to current accounts (Europe only), credit lines and other loans; to a lesser extent derivatives and contingencies. Clients are located globally.

Private Bank mortgage loan-to-value¹

	Dec 31, 2022	Dec 31, 2021
≤ 50 %	63 %	64 %
> 50 ≤ 70 %	17 %	17 %
> 70 ≤ 90 %	11 %	10 %
> 90 ≤ 100 %	3 %	3 %
> 100 ≤ 110 %	2 %	2 %
> 110 ≤ 130 %	2 %	2 %
> 130 %	2 %	2 %

¹ When assigning the exposure to the corresponding LTV buckets, the exposure amounts are distributed according to their relative share of the underlying assessed real estate value.

The LTV expresses the amount of exposure as a percentage of the underlying real estate value.

Our LTV ratios are calculated using the total exposure divided by the current determined value of the respective properties. These values are monitored and updated if necessary, on a regular basis. The exposure of transactions that are additionally backed by liquid collateral is reduced by the respective collateral values, whereas any prior charges increase the corresponding total exposure. The LTV calculation includes exposure which is secured by real estate collateral. Any mortgage lending exposure that is collateralized exclusively by any other type of collateral is not included in the LTV calculation.

The creditor's creditworthiness, the LTV and the quality of collateral is an integral part of our risk management when originating loans and when monitoring and steering our credit risks. In general, we are willing to accept higher LTV's, the better the creditor's creditworthiness is. Nevertheless, restrictions of LTV apply e.g. for countries with negative economic outlook or expected declines of real estate values.

As of December 31, 2022, 63 % of our exposure related to the mortgage lending portfolio had an LTV ratio below or equal to 50 %, slightly lower compared to the prior year.

Credit Exposure from Derivatives

All exchange traded derivatives are cleared through central counterparties ("CCPs"), the rules and regulations of which provide for daily margining of all current and future credit risk positions emerging out of such transactions. To the extent possible, the bank also uses CCP services for OTC derivative transactions ("OTC clearing"); the bank thereby benefits from the credit risk mitigation achieved through the CCP's settlement system.

The Dodd-Frank Act provides for an extensive framework for the regulation of OTC derivatives, including mandatory clearing, platform trading and transaction reporting of certain OTC derivatives, as well as rules regarding registration, capital, margin, business conduct standards, recordkeeping and other requirements for swap dealers, security-based swap dealers, major swap participants and major security-based swap participants. The Dodd-Frank Act and related CFTC rules require OTC clearing in the United States for certain standardized OTC derivative transactions, including certain interest rate swaps and index credit default swaps. Margin requirements for non-cleared derivative transactions in the US started in September 2016. The European Regulation (EU) No 648/2012 on OTC Derivatives, Central Counterparties and Trade Repositories ("EMIR") introduced a number of risk mitigation techniques for non-centrally cleared OTC derivatives in 2013 and the reporting of OTC and exchange traded derivatives in 2014. Mandatory clearing of certain standardized OTC derivatives transactions in the EU began in June 2016, and margin requirements for un-cleared OTC derivative transactions in the EU started in February 2017. Deutsche Bank implemented the exchange of both initial and variation margin in the EU from February 2017 for the first category of counterparties subject to the EMIR margin for un-cleared derivatives requirements.

The CFTC has adopted rules implementing the most significant provisions of the Dodd-Frank Act. More recently, in September 2020, the CFTC issued a final rule on the cross-border application of U.S. swap rules, which builds on, and in some cases supersedes the CFTC's cross-border guidance from 2013 and related no-action relief letters. In October 2020, also pursuant to the Dodd-Frank Act, the CFTC finalized regulations to impose position limits on certain commodities and economically equivalent swaps, futures and options.

The SEC has also finalized rules regarding registration, trade reporting, capital, margin, risk mitigation techniques, business conduct standards, trade acknowledgement and verification, recordkeeping and financial reporting, and cross-border requirements for security-based swap dealers and major security-based swap participants. Compliance with these requirements was generally required as of November 2021.

Finally, U.S. prudential regulators (the Federal Reserve, the FDIC, the Office of the Comptroller of the Currency, the Farm Credit Administration and the Federal Housing Finance Agency) have adopted final rules establishing margin requirements for non-cleared swaps and security-based swaps that are applicable to swap dealers and security-based swap dealers that are subject to U.S. prudential regulations (such as Deutsche Bank) in lieu of the CFTC's and the SEC's margin rules. Deutsche Bank implemented the exchange of both initial and variation margin for uncleared derivatives in the U.S. from September 2016, for the first category of counterparties subject to the U.S. prudential regulators' margin requirements. Additional initial margin requirements for smaller counterparties have been phased in from September 2017 through September 2022, with the relevant compliance dates depending in each case on the transactional volume of the parties and their affiliates.

The following table shows a breakdown of notional amounts and gross market values for assets and liabilities of exchange traded and OTC derivative transactions on the basis of clearing channel.

Notional amounts of derivatives on basis of clearing channel and type of derivative

in € m.	Notional amount maturity distribution				Positive market value	Negative market value	Net market value
	Within 1 year	> 1 and ≤ 5 years	After 5 years	Total			
Interest rate related:							
OTC	14,487,820	10,421,941	7,332,258	32,242,019	144,155	132,350	11,805
Bilateral (Amt)	1,422,223	2,200,127	1,501,758	5,124,107	118,768	107,854	10,914
CCP (Amt)	13,065,597	8,221,814	5,830,501	27,117,911	25,387	24,496	891
Exchange-traded	515,543	117,763	45	633,351	663	624	39
Total Interest rate related	15,003,362	10,539,704	7,332,304	32,875,370	144,818	132,974	11,844
Currency related:							
OTC	6,368,113	1,007,862	403,215	7,779,190	141,531	135,670	5,861
Bilateral (Amt)	6,246,281	998,771	403,037	7,648,090	140,039	134,420	5,619
CCP (Amt)	121,831	9,090	178	131,100	1,492	1,250	242
Exchange-traded	19,869	0	0	19,869	17	20	(3)
Total Currency related	6,387,981	1,007,862	403,215	7,799,058	141,548	135,690	5,858
Equity/index related:							
OTC	14,769	8,447	1,021	24,236	598	2,012	(1,414)
Bilateral (Amt)	14,769	8,447	1,021	24,236	598	2,012	(1,414)
CCP (Amt)	0	0	0	0	0	0	0
Exchange-traded	156,839	44,868	1,078	202,784	3,213	2,978	234
Total Equity/index related	171,607	53,315	2,099	227,021	3,811	4,991	(1,179)
Credit derivatives related							
OTC	193,047	1,238,463	91,903	1,523,414	9,899	8,311	1,589
Bilateral (Amt)	101,699	87,969	30,933	220,600	3,611	2,078	1,533
CCP (Amt)	91,348	1,150,495	60,970	1,302,813	6,288	6,233	55
Exchange-traded	0	0	0	0	0	0	0
Total Credit derivatives related	193,047	1,238,463	91,903	1,523,414	9,899	8,311	1,589
Commodity related:							
OTC	1,827	16,546	1,492	19,865	86	231	(144)
Bilateral (Amt)	1,827	16,546	1,492	19,865	86	230	(145)
CCP (Amt)	0	0	0	0	0	0	0
Exchange-traded	21,943	1,860	0	23,803	177	186	(9)
Total Commodity related	23,770	18,405	1,492	43,668	263	416	(154)
Other:							
OTC	48,427	4,877	106	53,410	752	747	5
Bilateral (Amt)	48,427	4,877	106	53,410	752	747	5
CCP (Amt)	0	0	0	0	0	0	0
Exchange-traded	5,250	0	0	5,250	12	11	1
Total Other	53,676	4,877	106	58,660	764	758	6
Total OTC business	21,114,002	12,698,136	7,829,996	41,642,134	297,022	279,320	17,702
Total bilateral business	7,835,226	3,316,737	1,938,347	13,090,309	263,854	247,341	16,513
Total CCP business	13,278,776	9,381,399	5,891,650	28,551,825	33,168	31,979	1,189
Total exchange-traded business	719,442	164,491	1,123	885,056	4,081	3,819	262
Total	21,833,444	12,862,626	7,831,119	42,527,190	301,103	283,139	17,964
Positive market values after netting and cash collateral received	-	-	-	-	29,744	-	-

Dec 31, 2021

in € m.	Notional amount maturity distribution				Positive market value	Negative market value	Net market value
	Within 1 year	> 1 and ≤ 5 years	After 5 years	Total			
Interest rate related:							
OTC	13,625,153	10,672,998	6,717,198	31,015,349	167,037	154,392	12,645
Bilateral (Amt)	1,541,797	1,976,392	1,542,479	5,060,668	156,247	143,526	12,721
CCP (Amt)	12,083,356	8,696,606	5,174,718	25,954,681	10,790	10,865	(76)
Exchange-traded	730,798	286,032	514	1,017,344	174	131	43
Total Interest rate related	14,355,951	10,959,030	6,717,712	32,032,693	167,211	154,523	12,688
Currency related:							
OTC	5,323,845	847,188	420,701	6,591,734	108,030	108,282	(252)
Bilateral (Amt)	5,220,578	843,099	420,511	6,484,189	107,244	107,347	(103)
CCP (Amt)	103,267	4,088	190	107,545	786	934	(148)
Exchange-traded	20,765	0	0	20,765	2	8	(6)
Total Currency related	5,344,610	847,188	420,701	6,612,499	108,032	108,289	(258)
Equity/index related:							
OTC	25,341	9,272	2,881	37,493	5,595	3,666	1,929
Bilateral (Amt)	25,341	9,272	2,881	37,493	5,595	3,666	1,929
CCP (Amt)	0	0	0	0	0	0	0
Exchange-traded	184,194	44,141	2,286	230,621	3,455	4,723	(1,267)
Total Equity/index related	209,535	53,413	5,167	268,115	9,050	8,388	661
Credit derivatives related							
OTC	129,185	823,005	85,102	1,037,292	15,611	16,359	(748)
Bilateral (Amt)	78,553	71,414	34,561	184,529	2,102	2,466	(364)
CCP (Amt)	50,632	751,591	50,540	852,763	13,509	13,892	(384)
Exchange-traded	0	0	0	0	0	0	0
Total Credit derivatives related	129,185	823,005	85,102	1,037,292	15,611	16,359	(748)
Commodity related:							
OTC	2,764	3,419	1,421	7,605	105	107	(2)
Bilateral (Amt)	2,764	3,419	1,421	7,605	105	107	(2)
CCP (Amt)	0	0	0	0	0	0	0
Exchange-traded	27,241	1,356	0	28,598	218	225	(6)
Total Commodity related	30,006	4,776	1,421	36,203	323	332	(8)
Other:							
OTC	40,047	3,565	157	43,769	606	675	(69)
Bilateral (Amt)	40,047	3,565	157	43,769	606	675	(69)
CCP (Amt)	0	0	0	0	0	0	0
Exchange-traded	8,786	186	0	8,971	5	9	(5)
Total Other	48,832	3,751	157	52,741	610	684	(74)
Total OTC business	19,146,335	12,359,447	7,227,460	38,733,243	296,983	283,480	13,503
Total bilateral business	6,909,080	2,907,161	2,002,011	11,818,253	271,899	257,787	14,111
Total CCP business	12,237,255	9,452,286	5,225,448	26,914,990	25,084	25,692	(608)
Total exchange-traded business	971,784	331,716	2,800	1,306,300	3,854	5,095	(1,241)
Total	20,118,119	12,691,163	7,230,260	40,039,542	300,837	288,575	12,262
Positive market values after netting and cash collateral received	-	-	-	-	25,518	-	-

Equity Exposure

The table below presents the carrying values of equity investments according to IFRS definition split by trading and nontrading for the respective reporting dates. Deutsche Bank manages its respective positions within market risk and other appropriate risk frameworks.

Composition of Equity Exposure

in € m.	Dec 31, 2022	Dec 31, 2021
Trading Equities	2,374	5,094
Nontrading Equities ¹	2,077	2,644
Total Equity Exposure	4,451	7,739

¹ Includes equity investment funds amounting to € 101 million as of December 31, 2022 and € 87 million as of December 31, 2021.

As of December 31, 2022, € 2.1 billion of the Group's trading equities exposure was held by Investment Bank. Overall, trading equities decreased by € 2.7 billion year on year driven mainly due to market volatility, option expiry and increased securitizations.

Trading Market Risk Exposures

Value-at-Risk Metrics of Trading Units of Deutsche Bank Group

The tables and graph below present the Historic Simulation value-at-risk metrics calculated with a 99 % confidence level and a one-day holding period for the Group's trading units.

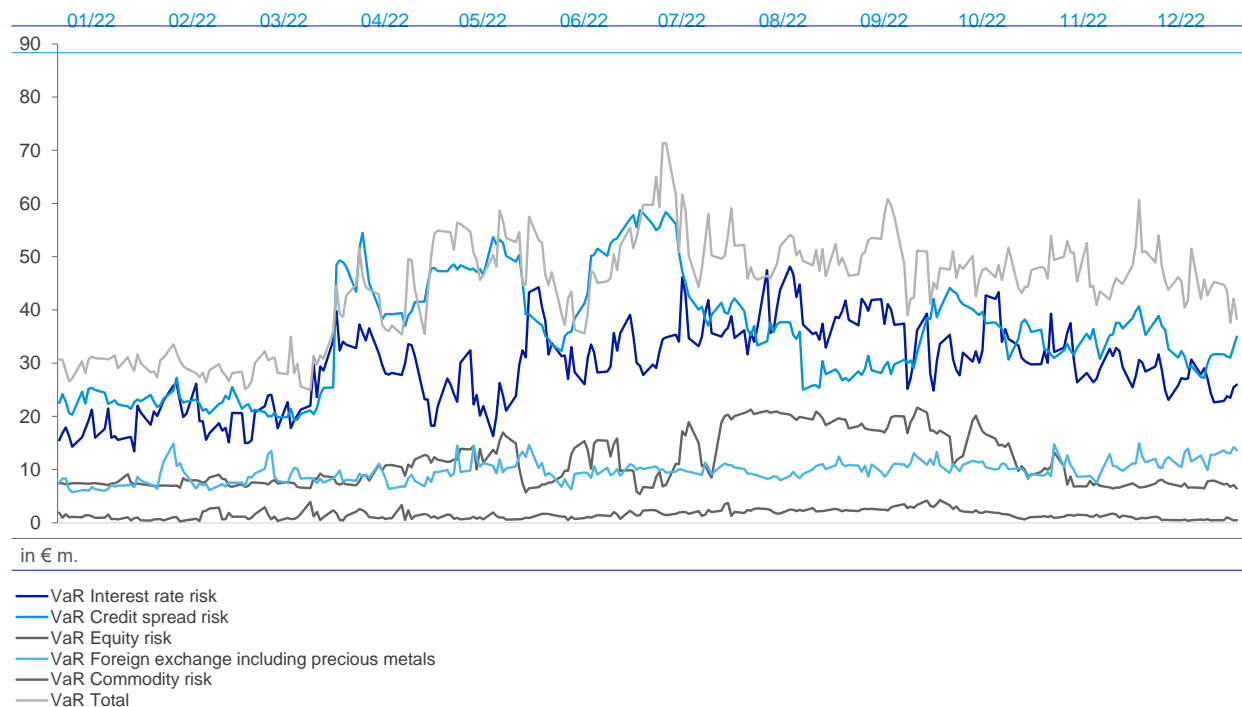
Value-at-Risk of Trading Units by Risk Type¹

in € m.	Total		Diversification effect		Interest rate risk		Credit spread risk		Equity price risk		Foreign exchange risk ²		Commodity price risk	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Average	44.0	37.5	(43.3)	(37.2)	29.4	23.1	35.4	27.9	11.4	13.0	9.7	9.5	1.5	1.1
Maximum	71.4	69.0	(21.7)	(21.0)	48.1	38.5	58.7	60.3	21.7	20.1	15.0	25.2	4.3	7.9
Minimum	24.9	27.7	(67.1)	(76.9)	13.4	11.3	19.3	17.5	5.4	6.8	5.8	4.4	0.3	0.3
Period-end	38.3	31.1	(43.3)	(27.0)	26.0	16.6	35.0	24.1	6.4	8.3	13.6	8.1	0.5	1.0

¹ Figures for 2022 as of December 31, 2022. Figures for 2021 as of December 31, 2021.

² Includes value-at-risk from gold and other precious metal positions.

Development of historic simulation value-at-risk by risk types in 2022



The average value-at-risk over 2022 was € 44 million, which increased by € 6.5 million (+17 %) compared to the average for 2021; this was primarily driven by inclusion of increased market volatility in the rolling 1yr period mainly impacting interest rates exposures.

For regulatory reporting purposes, the incremental risk charge for the respective reporting dates represents the higher of the spot value at the reporting dates, and their preceding 12-week average calculation.

Average, Maximum and Minimum Incremental Risk Charge of Trading Units (with a 99.9 % confidence level and one-year capital horizon)^{1,2,3}.

in € m.	Total		Credit Trading		Core Rates		Emerging Markets		Other ⁴	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Average	319.0	436.6	54.5	118.1	137.0	211.4	110.2	188.3	17.4	(81.2)
Maximum	414.0	604.1	130.6	154.6	305.0	574.5	332.4	267.9	51.2	59.1
Minimum	272.4	292.5	(33.2)	62.5	53.2	60.1	39.3	84.4	(31.7)	(224.9)
Period-end	291.2	292.5	11.6	85.4	161.9	78.0	100.2	133.1	17.4	(4.0)

¹ Amounts show the bands within which the values fluctuated during the 12-weeks preceding December 31, 2022 and December 31, 2021, respectively.

² Business line breakdowns have been updated for 2022 reporting to better reflect the current business structure.

³ All liquidity horizons are set to 12 months.

⁴ Other includes Capital Release Unit.

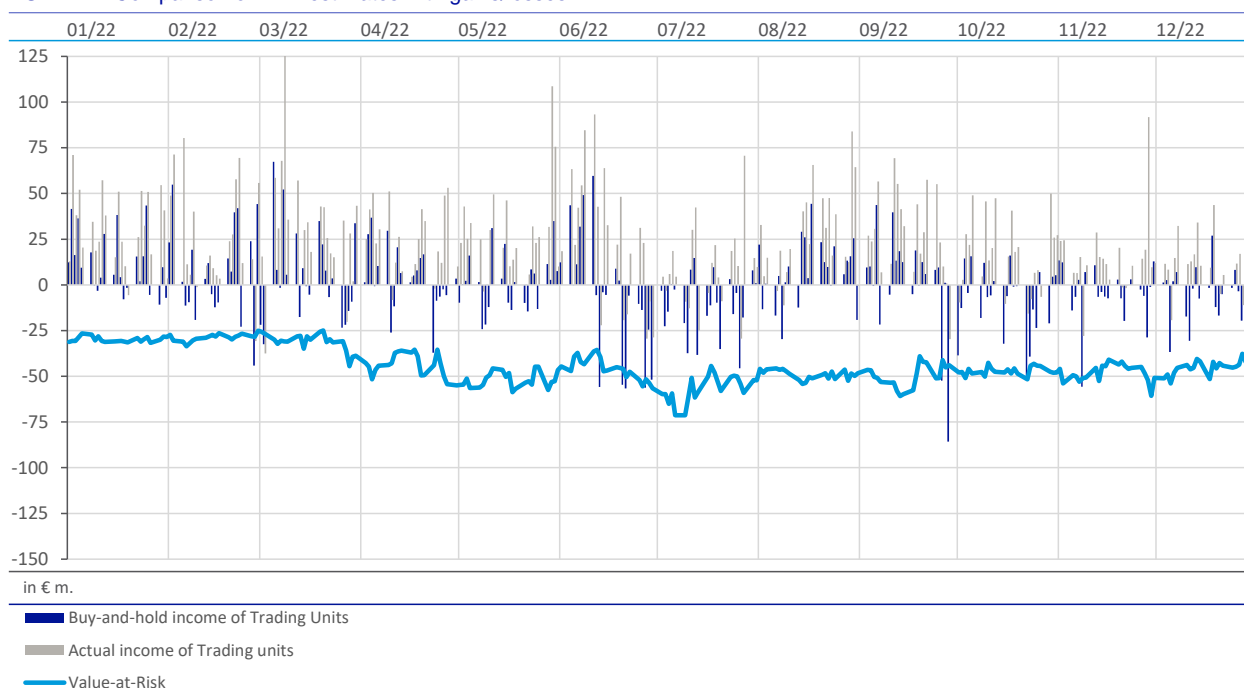
The incremental risk charge as at the end of 2022 was € 291 million, broadly in line with year-end 2021. The average of the incremental risk charge as at the end of 2022 was € 319 million and thus € 118 million (-27 %) lower compared with the average for the period ended December 31, 2021. The decrease in the average incremental risk charge for 2022 was driven by changes in European government bond positions and reduction in long credit index exposure under Fixed Income and Currencies Trading business.

Results of Regulatory Backtesting of Trading Market Risk

In 2022, the Group observed a number of outliers where the Group's loss on a buy-and-hold basis exceeded the value-at-risk of the Trading books. This was driven by a sharp increase in market volatility in interest rates and credit spreads leading to market moves that were larger than those within the preceding one-year period used in the value-at-risk calculation.

Based on the backtesting results, the analysis of the underlying reasons for outliers and enhancements included in the value-at-risk methodology, the Group continues to believe that the value-at-risk model will remain an appropriate measure for the trading market risk under normal market conditions. The following graph shows the trading units daily buy-and-hold income in comparison to the value-at-risk as of the close of the previous business day for the trading days of the reporting period. The value-at-risk is presented in negative amounts to visually compare the estimated potential loss of the trading positions with the buy and hold income. Figures are shown in millions of euro. The chart shows that the trading units achieved a positive buy and hold income for 84 % of the trading days in 2022 as well as displays the global outliers experienced in 2022.

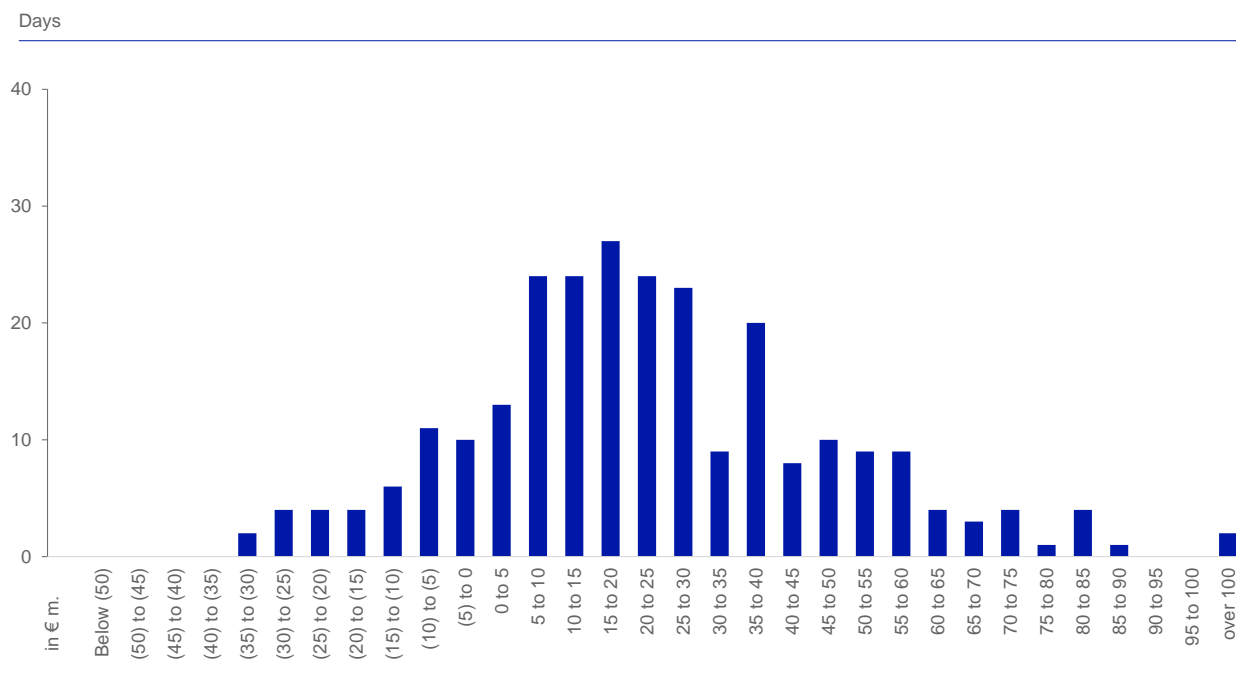
EU MR4 – Comparison of VAR estimates with gains/losses



Daily Income of Deutsche Bank Group Trading Units

The following histogram shows the distribution of daily income of Group trading units. Daily income is defined as total income which consists of new trades, fees & commissions, buy & hold income, reserves, carry and other income. It displays the number of trading days on which the Group reached each level of trading income shown on the horizontal axis in millions of euro.

Distribution of daily income of Group's trading units in 2022



The trading units achieved a positive revenue for 84 % of the trading days in 2022 which is same as for the full year 2021.

Nontrading Market Risk Exposures

Economic Capital Usage for Non-trading Market Risk

The following table shows the Nontrading Market Risk economic capital usage by risk type:

Economic Capital Usage by risk type.

in € m.	Economic capital usage	
	Dec 31, 2022	Dec 31, 2021
Interest rate risk	1,752	1,853
Credit spread risk	29	21
Equity and Investment risk	841	1,031
Foreign exchange risk	1,460	1,509
Pension risk	803	1,128
Guaranteed funds risk	82	85
Total non-trading market risk portfolios	4,968	5,628

The economic capital figures do take into account diversification benefits between the different risk types.

Economic Capital Usage for Non-trading Market Risk totaled € 5.0 billion as of December 31, 2022, which is € 0.6 billion below the economic capital usage at year-end 2021.

- Interest rate risk. Economic capital charge for interest rate risk in the banking book, including gap risk, basis risk and option risk, such as the risk of a change in client behavior embedded in modelled non-maturity deposits or prepayment risk. In total the economic capital usage for December 31, 2022 was € 1,752 million, compared to € 1,853 million for December 31, 2021.
- Credit spread risk. Economic capital charge for portfolios in the banking book subject to credit spread risk. Economic capital usage was € 29 million as of December 31, 2022, versus € 21 million as of December 31, 2021.
- Equity and Investment risk. Economic capital charge for equity risk from a structural short position in the bank's own share price arising from the Group's equity compensation plans, and from the non-consolidated investment holdings, such as strategic investments and alternative assets. The economic capital usage was € 841 million as of December 31, 2022, compared with € 1,031 million as of December 31, 2021. The decrease in economic capital contribution was predominately driven by a reduction in the equity compensation short position caused by increasing hedge volumes.
- Foreign exchange risk. Foreign exchange risk predominantly arises from the Group's structural position taken to immunize the sensitivity of the bank's capital ratio against changes in the exchange rates. The economic capital usage was € 1,460 million as of December 31, 2022, versus € 1,509 million as of December 31, 2021.
- Pension risk. This risk arises from the Group's defined benefit obligations, including interest rate risk and inflation risk, credit spread risk, equity risk and longevity risk. The economic capital usage was € 803 million and € 1,128 million as of December 31, 2022 and December 31, 2021 respectively. The economic capital usage decrease was mainly driven by reduced credit exposure caused by increasing interest rates.
- Guaranteed funds risk. Economic capital usage was € 82 million as of December 31, 2022, versus € 85 million as of December 31, 2021.

Interest Rate Risk in the Banking Book

The following table shows the impact on the Group's net interest income in the banking book as well as the change of the economic value for the banking book positions from interest rate changes under the six standard scenarios defined by the EBA:

Economic value & net interest income interest rate risk in the banking book by EBA scenario

in € bn.	Delta EVE		Delta NII ¹	
	Dec 31, 2022	Dec 31, 2021	Dec 31, 2022	Dec 31, 2021
Parallel up	(4.6)	(3.5)	1.9	1.4
Parallel down	1.3	0.1	(1.1)	(0.9)
Steeper	(0.1)	(0.0)	(0.4)	(0.7)
Flatter	(1.4)	(1.3)	1.5	1.1
Short rates up	(2.4)	(1.7)	2.3	1.7
Short rates down	1.2	0.4	(1.2)	(0.9)
Maximum	(4.6)	(3.5)	(1.2)	(0.9)

in € bn.	Dec 31, 2022	Dec 31, 2021
Tier 1 Capital	56.6	55.4

¹ Delta Net Interest Income (NII) reflects the difference between projected NII in the respective scenario with shifted rates vs. market implied rates. Sensitivities are based on a static balance sheet at constant exchange rates, excluding trading positions and DWS. Figures do not include Mark-to-Market (MtM)/Other Comprehensive Income (OCI) effects on centrally managed positions not eligible for hedge accounting.

The maximum economic value of equity loss was € (4.6) billion as of December 2022, compared to € (3.5) billion as of December 2021. As per December 2022 the maximum EVE loss represents 8.1 % of Tier 1 Capital.

The maximum economic value of equity (EVE) loss due to a +200 basis points parallel shift of the yield curve across all currencies as defined by the BaFin was € (4.6) billion as of December 2022, representing 6.9 % of Total Capital.

The increase in the maximum economic value of equity loss for the 'Parallel up' interest rate scenario was mainly driven by changes in risk positions in Deutsche Bank's Treasury. Those risks are part of the IRRBB framework and are managed via defined risk management.

The maximum one-year loss in net interest income (NII) was € (1.2) billion as of December 2022, compared to € (0.9) billion as of December 2021.

The maximum loss for the 12M net interest income sensitivity for the interest rate down scenario was increased by circa € (0.3) billion.

The increase in the maximum net interest income loss in the short rate down scenario was mainly driven by the increase in Euro interest rates observed in 2022. The increase leads to higher interest rate downward shocks that are applied in floored regulatory standard scenarios with corresponding higher net interest income losses.

Additionally, the higher interest rate environment resulted in a more normalized NIM (Net Interest Margin) in the base scenario compared to a compressed margin in the downwards shock scenario.

The following table shows the variation of the economic value for Deutsche Bank's banking book positions resulting from downward and upward interest rate shocks by currency:

Economic value interest rate risk in the banking book by currency

in € bn.	Dec 31, 2022	
	Parallel up	Parallel down
EUR	(3.5)	1.2
USD	(1.2)	0.6
Other	0.1	(0.5)
Total	(4.6)	1.3

Operational risk exposure

Operational risk – risk profile

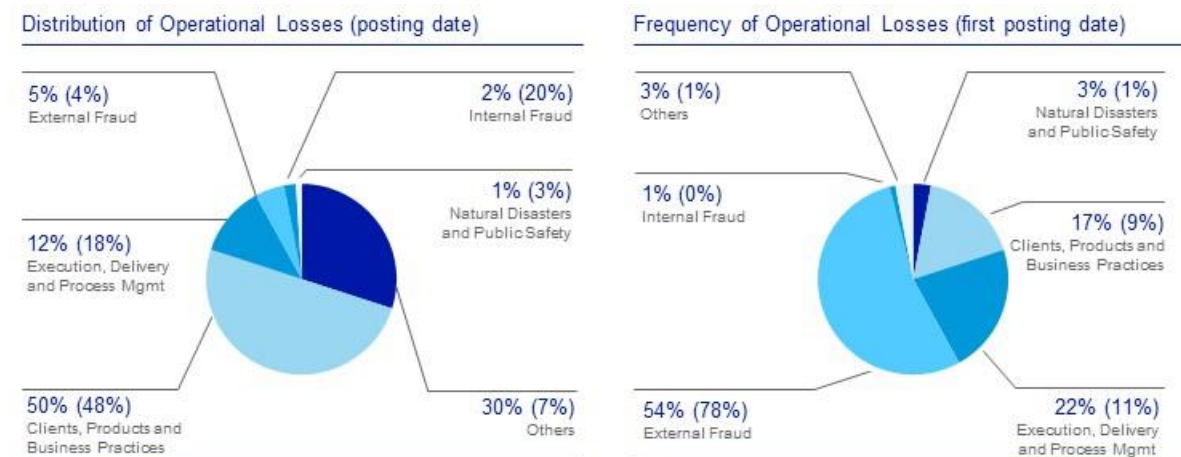
Operational risk losses by event type (profit and loss view)

in € m.	2022	2021 ¹
Clients, Products and Business Practices	263	347
Others	158	78
Execution, Delivery and Process Management	65	38
External Fraud	28	12
Internal Fraud	7	72
Natural Disasters and Public Safety	7	6
Group	528	553

¹ 2021 loss figures revised from prior year presentation due to subsequent capture of losses and reclassification. Losses are reported after offsetting insurance.

As of December 31, 2022, operational losses reduced by € 25 million to € 528 million. The overall reduction in losses was driven by the event type "Internal Fraud" offset partially by increases in "Execution, Delivery and Process Management" and "External Fraud". Legal losses were broadly stable when aggregating settled matters and changes in litigation reserves for unsettled matters across "Clients, Products and Business Practices" and "Others".

Operational losses by event type occurred in the period 2022 (2017 - 2021)¹



¹ Percentages in brackets correspond to loss frequency respectively to loss amount for losses occurred in 2017-2021 period. Frequency and amounts can change subsequently.

"Distribution of Operational Losses" (above left) summarizes the proportion of operational risk loss postings by event type using the P&L value in 2022, against the average for the comparative five-year period 2017-2021 (in brackets). The event type "Clients, Products and Business Practices" represents 50% of operational losses and is largely made up of settled matters and changes in litigation reserves for unsettled matters.

“Frequency of Operational Losses” (above right) summarizes the proportion of operational risk events by event type (based on a count of events where losses were first recognized in 2022), against the average for the comparative five-year period 2017-2021 (in brackets). The highest event type frequency, “External Fraud” made up 54% of all observed loss events. Although this event type contributed majorly to the frequency distribution of event losses in 2022, the size of losses experienced were minor compared with other event types.

Whilst the bank seeks to ensure the comprehensive capture of all operational risk loss events with a P&L impact of € 10,000 or greater, the totals shown in this section may be underestimated due to delayed detection and recording of loss events.

Liquidity Risk Exposure

Funding Markets and Capital Markets Issuance

The macro environment remained challenging in 2022 with the war in Ukraine and global inflation concerns weighing on markets and negatively impacting credit spreads. Notwithstanding this backdrop, the Bank navigated markets well and successfully executed the 2022 Issuance Plan of € 15-20 billion by year-end.

Looking at the performance of the Bank’s credit in the market, the Bank’s Senior Non-Preferred cash bonds widened versus peers until October-2022 but then started to outperform the peer group in EUR and in USD. This outperformance was supported by an upgrade in the Deutsche Bank’s credit rating from Moody’s in October.

This funding was spread across the funding sources as follows: AT1 issuance (€ 2 billion), Tier 2 issuance (€ 2.6 billion), Senior non-preferred issuance (€ 8.8 billion), senior preferred (non-structured) issuance (€ 2.8 billion) and covered bonds (€ 3.5 billion). In addition, the Group issued € 4.3 billion of structured notes, not planned for in the € 15-20 billion 2022 issuance plan. Excluding these structured notes, the Group’s total issuance came to € 19.7 billion. The € 24 billion total 2022 issuance is divided into Euro (€ 13.5 billion), USD (€ 8.9 billion), GBP (€ 0.8 billion) and other currencies aggregated (€ 0.5 billion).

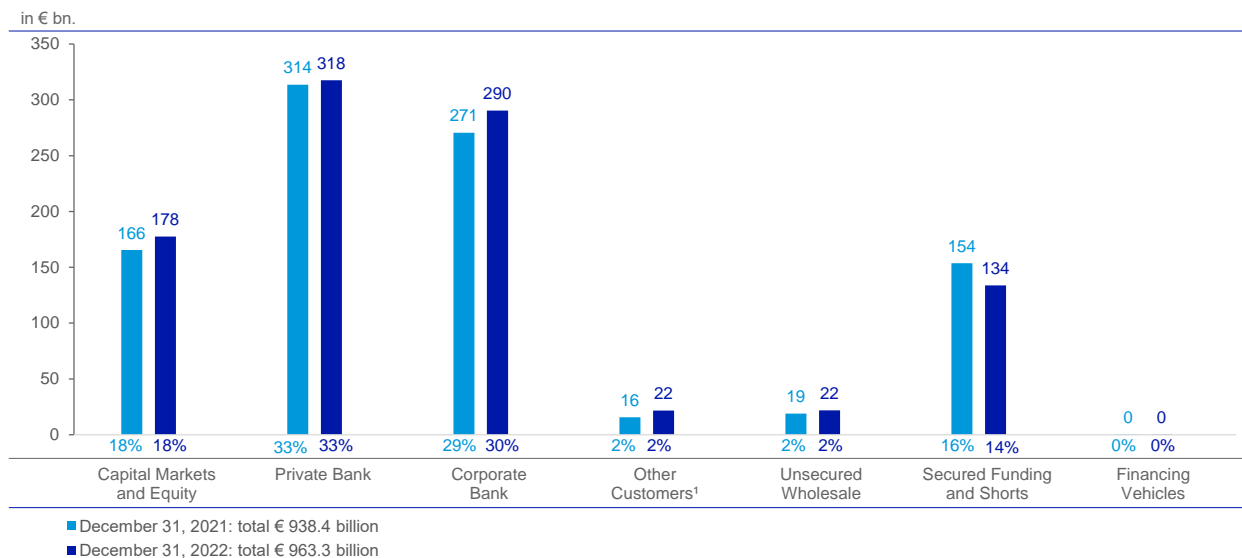
The Group’s investor base for 2022 issuances comprised asset managers and pension funds (40 %), retail customers (7 %), banks (18 %), governments and agencies (1 %), insurance companies (9 %) and other institutional investors (25 %). The geographical distribution was split between Germany (24 %), rest of Europe (41 %), U.S. (19 %), Asia/Pacific (14 %) and Other (2 %). The average spread of issuance over 3-months-Euribor / risk free rate was 194 basis points for the full year. The average tenor was 5.7 years. Volume-wise, the bank’s issuance activity was evenly split between the first half of 2022 and the second half of 2022. The Group issued the following volumes over each quarter during 2022: first quarter: € 7.3 billion, second quarter: € 4.8 billion, third quarter: € 7.1 billion and fourth quarter: € 4.8 billion.

Deutsche Bank’s issuance plan for 2023 is lower than for 2022 at € 13-18 billion and comprises capital instruments, senior non-preferred, senior preferred and covered bonds. The Group also plans to raise a portion of this funding in U.S. dollar and may enter into cross currency swaps to manage any residual requirements. The Bank has total capital markets maturities, excluding legally exercisable calls, of approximately € 12 billion in 2023.

Funding Diversification

In 2022, total external funding increased by € 24.8 billion from € 938.4 billion at December 31, 2021 to € 963.3 billion at December 31, 2022. The increase was primarily driven by inflows in the Corporate Bank, where deposits increased by € 19.8 billion. Deutsche Bank’s most stable deposits in the Private Bank increased by € 3.9 billion predominately within the International Private Bank. The unsecured Wholesale Funding portfolio increased by € 3.0 billion driven by Deposit inflows. In addition, Capital Markets and Equity increased by € 12.0 billion driven by an increase of € 4.3 billion in Equity and € 7.8 billion in long-term Debt Issuances. The € 19.9 billion decrease of Secured funding and shorts relates to Deutsche Bank’s prepayment of TLTRO of € 11.0 billion as well as a decrease of € 4.1 billion in trading liabilities and € 4.8 billion in repurchase operations.

Composition of External Funding Sources



¹ Other Customers includes fiduciary deposits, X-markets notes and margin/Prime Brokerage cash balances (shown on a net basis).
Reference: Reconciliation to total balance sheet of € 1,344.2 billion (€ 1,324.7 billion): Derivatives & settlement balances € 296.5 billion (€ 306.8 billion), add-back for netting effect for margin/Prime Brokerage cash balances (shown on a net basis) € 50.4 billion (€ 49.0 billion), other non-funding liabilities € 34.1 billion (€ 30.5 billion) for December 31, 2022 and December 31, 2021, respectively.

Maturity of unsecured wholesale funding, ABCP and capital markets issuance¹

Dec 31, 2022

in € m.	Not more than 1 month	Over 1 month but not more than 3 months	Over 3 months but not more than 6 months	Over 6 months but not more than 1 year	Sub-total less than 1 year	Over 1 year but not more than 2 years	Over 2 years	Total
Deposits from banks	549	156	528	1,200	2,432	0	526	2,958
Deposits from other wholesale customers	4,477	4,448	3,502	1,690	14,118	869	927	15,915
CDs and CP	88	801	1,438	782	3,109	0	9	3,118
ABCP	0	0	0	0	0	0	0	0
Senior non-preferred plain vanilla	2,271	285	1,920	823	5,299	13,284	33,478	52,061
Senior preferred plain vanilla	19	0	125	1,077	1,221	3,610	3,897	8,727
Senior structured	143	542	1,392	940	3,017	1,958	11,064	16,040
Covered bonds/ABS	518	0	599	389	1,506	3,084	11,799	16,389
Subordinated liabilities	0	10	2,581	307	2,899	1,723	16,151	20,773
Other	0	0	0	0	0	0	0	0
Total	8,066	6,242	12,086	7,208	33,601	24,528	77,851	135,980
Of which:								
Secured	518	0	599	389	1,506	3,084	11,799	16,389
Unsecured	7,548	6,242	11,487	6,818	32,095	21,444	66,051	119,591

¹ Includes additional Tier 1 notes reported as additional equity components in the financial statements. Liabilities with call features are shown at earliest legally exercisable call date. No assumption is made as to whether such calls would be exercised.

² Secured funding volume reported post own debt elimination

The total volume of unsecured wholesale liabilities, ABCP and capital markets issuance maturing within one year amount to € 32 billion as of December 31, 2022, and should be viewed in the context of our total Liquidity Reserves of € 256 billion.

Dec 31, 2021

in € m.	Not more than 1 month	Over 1 month but not more than 3 months	Over 3 months but not more than 6 months	Over 6 months but not more than 1 year	Sub-total less than 1 year	Over 1 year but not more than 2 years	Over 2 years	Total
Deposits from banks	1,556	572	447	490	3,065	63	52	3,180
Deposits from other wholesale customers	4,577	3,944	1,178	2,276	11,975	617	957	13,549
CDs and CP	242	288	1,009	1,014	2,553	0	0	2,553
ABCP	0	0	0	0	0	0	0	0
Senior non-preferred plain vanilla	1,375	2,932	1,836	2,590	8,733	6,259	37,858	52,850
Senior preferred plain vanilla	3	39	38	9	89	3,394	2,520	6,003
Senior structured	105	487	546	1,471	2,610	2,325	10,162	15,096
Covered bonds/ABS	110	151	723	361	1,345	1,509	11,356	14,210
Subordinated liabilities	0	0	2,016	280	2,296	1,336	13,949	17,581
Other	213	0	0	0	213	0	0	213
Total	8,180	8,413	7,794	8,491	32,878	15,503	76,854	125,234
Of which:								
Secured	110	151	723	361	1,345	1,509	11,356	14,210
Unsecured	8,070	8,262	7,070	8,130	31,533	13,994	65,497	111,024

The following table shows the currency breakdown of our short-term unsecured wholesale funding, of our ABCP funding and of our capital markets issuance.

Unsecured wholesale funding, ABCP and capital markets issuance (currency breakdown)

in € m.	Dec 31, 2022					Dec 31, 2021				
	in EUR	in USD	in GBP	in other CCYs	Total	in EUR	in USD	in GBP	in other CCYs	Total
Deposits from banks	1,216	963	47	732	2,958	986	797	414	984	3,180
Deposits from other whole-sale customers	4,437	9,047	278	2,152	15,915	3,346	7,946	201	2,055	13,549
CDs and CP	1,035	1,423	133	527	3,118	1,370	837	0	345	2,553
ABCP	0	0	0	0	0	0	0	0	0	0
Senior non-preferred plain vanilla	24,052	21,826	2,735	3,448	52,061	25,583	21,244	2,297	3,726	52,850
Senior preferred plain vanilla	3,125	5,415	0	186	8,727	1,989	3,838	0	176	6,003
Senior structured	6,712	7,517	24	1,785	16,040	6,720	6,395	12	1,970	15,096
Covered bonds/ABS	16,387	2	0	0	16,389	14,210	0	0	0	14,210
Subordinated liabilities	10,070	9,597	917	189	20,773	8,396	8,216	774	195	17,581
Other	0	0	0	0	0	213	0	0	0	213
Total	67,035	55,792	4,134	9,019	135,980	62,813	49,272	3,698	9,451	125,234
Of which:										
Secured	16,387	2	0	0	16,389	14,210	0	0	0	14,210
Unsecured	50,648	55,790	4,134	9,019	119,591	48,603	49,272	3,698	9,451	111,024

Liquidity Reserves

Composition of our liquidity reserves by parent company (including branches) and subsidiaries

in € bn.	Dec 31, 2022		Dec 31, 2021	
	Carrying Value	Liquidity Value	Carrying Value	Liquidity Value
Available cash and cash equivalents (held primarily at central banks)	166	166	181	181
Parent (incl. foreign branches)	138	138	144	144
Subsidiaries	28	28	37	37
Highly liquid securities (includes government, government guaranteed and agency securities)	56	56	40	40
Parent (incl. foreign branches)	35	35	20	20
Subsidiaries	21	21	20	20
Other unencumbered central bank eligible securities	34	31	20	18
Parent (incl. foreign branches)	29	26	15	13
Subsidiaries	5	5	5	5
Total liquidity reserves	256	253	241	239
Parent (incl. foreign branches)	202	199	179	177
Subsidiaries	54	54	62	62

As of December 31, 2022, the Group's liquidity reserves amounted to € 256 billion compared with € 241 billion as of December 31, 2021. The increase of € 15 billion comprised approximately a € 16 billion increase in highly liquid securities and € 14 billion increase in other unencumbered securities, offset by a decrease of € 15 billion in cash and cash equivalents. The development was primarily driven by higher deposits, new capital market issuances, partially offset by ECB's TLTRO repayment and increased lending activity. The quarterly average of the Group's Liquidity Reserves for this year is € 252 billion compared with € 247 billion during 2021. In the table above the carrying value represents the market value of the Liquidity Reserves while the liquidity value reflects the bank's assumption of the value that could be obtained, primarily through secured funding, taking into account the experience observed in secured funding markets at times of stress.

Liquidity Coverage Ratio

The year-end LCR as of December 31, 2022 stands at 141.6% compared to 133.1 % as of December 31, 2021.

The Group's twelve month weighted average LCR was 135%. This has been calculated in accordance with the Commission Delegated Regulation (EU) 2015/61 and the EBA Guidelines on LCR disclosure to complement the disclosure of liquidity risk management under Article 435 CRR.

LCR components

	Dec 31, 2022	Dec 31, 2021
	Total adjusted weighted value (average)	Total adjusted weighted value (average)
in € bn. (unless stated otherwise)		
Number of data points used in the calculation of averages	12	12
High Quality Liquid Assets	218	220
Total net cash outflows	161	155
Liquidity Coverage Ratio (LCR) in %	135 %	142 %

Funding Risk Management

Structural Funding

All funding matrices (the aggregate currency, the USD and the GBP funding matrix) were in line with the respective risk appetite as of year ends 2022 and 2021.

Stress Testing and Scenario Analysis

At the end of 2022 the Group's stressed Net Liquidity Position stood at € 48 billion compared to €43 billion at the end of 2021. The predominant driver of the increase was business activities partly offset by methodology changes.

Global All Currency Daily Stress Testing Results

	Dec 31, 2022			Dec 31, 2021		
in € bn.	Funding Gap ¹	Gap Closure ²	Net Liquidity Position	Funding Gap ¹	Gap Closure ²	Net Liquidity Position
Systemic market risk	120	234	114	100	215	115
1 notch downgrade (DB specific)	90	234	145	78	215	137
Severe downgrade (DB specific)	154	251	97	152	235	84
Combined ^{3,4}	206	254	48	195	239	43

¹ Funding gap caused by impaired rollover of liabilities and other projected outflows

² Based on liquidity generation through Liquidity Reserves and other business mitigants

³ Combined impact of systemic market risk and severe downgrade

⁴ December 2021 sNLP has been updated from € 47.6 billion to € 43.3 billion due to a model change for a product variant in the Investment bank portfolio; this primarily impacts the EUR sNLP which was restated from € 21 billion to € 18 billion

Global EUR Daily Stress Testing Results

	Dec 31, 2022			Dec 31, 2021		
in € m.	Funding Gap ¹	Gap Closure ²	Net Liquidity Position	Funding Gap ¹	Gap Closure ²	Net Liquidity Position
Combined ³	95	109	14	91	109	18

¹ Funding gap caused by impaired rollover of liabilities and other projected outflows

² Based on liquidity generation through Liquidity Reserves and other business mitigants

³ Combined impact of systemic market risk and severe downgrade

Global USD Daily Stress Testing Results

in € bn.	Dec 31, 2022			Dec 31, 2021		
	Funding Gap ¹	Gap Closure ²	Net Liquidity Position	Funding Gap ¹	Gap Closure ²	Net Liquidity Position
Combined ³	81	103	22	78	88	10

¹ Funding gap caused by impaired rollover of liabilities and other projected outflows

² Based on liquidity generation through Liquidity Reserves and other business mitigants

³ Combined impact of systemic market risk and severe downgrade

Global GBP Daily Stress Testing Results

in € bn.	Dec 31, 2022			Dec 31, 2021		
	Funding Gap ¹	Gap Closure ²	Net Liquidity Position	Funding Gap	Gap Closure	Net Liquidity Position
Combined ³	6	11	5	4	8	4

¹ Funding gap caused by impaired rollover of liabilities and other projected outflows

² Based on liquidity generation through Liquidity Reserves and other business mitigants

³ Combined impact of systemic market risk and severe downgrade

The following table presents the amount needed to meet collateral requirements from contractual obligations in the event of a one- or two-notch downgrade by rating agencies for all currencies.

Contractual Obligations

in € m.	Dec 31, 2022		Dec 31, 2021	
	One-notch downgrade	Two-notch downgrade	One-notch downgrade	Two-notch downgrade
Contractual derivatives funding or margin requirements	389	434	205	294
Other contractual funding or margin requirements	0	0	0	0

Net stable funding ratio

The Net Stable Funding Ratio was 120% at the end the fourth quarter of 2022, a surplus to regulatory requirements of € 99 billion as compared to 121% as at the end of the fourth quarter of 2021, a surplus to regulatory requirements of € 105 billion. The decrease was primarily driven by ECB's TLTRO repayment and increased lending activity, partially offset by higher deposits, new capital market issuances.

Net stable funding ratio

in € bn. (unless stated otherwise)	Dec 31, 2022	Dec 31, 2021
	Total adjusted weighted value	Total adjusted weighted value (average)
Available stable funding (ASF)	606	602
Required stable funding (RSF)	507	498
Net Stable Funding Ratio (NSFR) in %	120 %	121 %

Asset Encumbrance

This section refers to asset encumbrance in the group of institutions consolidated for banking regulatory purposes pursuant to the German Banking Act. Therefore this excludes insurance companies or companies outside the finance sector. Assets pledged by our insurance subsidiaries are included in Note 20 "Assets Pledged and Received as Collateral" of the consolidated financial statements, and restricted assets held to satisfy obligations to insurance companies' policy holders are included within Note 37 "Information on Subsidiaries" of the consolidated financial statements.

Encumbered assets primarily comprise those on- and off-balance sheet assets that are pledged as collateral against secured funding, collateral swaps, and other collateralized obligations. Additionally, in line with EBA technical standards on regulatory asset encumbrance reporting, assets placed with settlement systems, including default funds and initial margins, as well as other assets pledged which cannot be freely withdrawn such as mandatory minimum reserves at central banks, are considered encumbered. We also include derivative margin receivable assets as encumbered under these EBA guidelines.

Readily available assets are those on- and off-balance sheet assets that are not otherwise encumbered, and which are in freely transferrable form. Unencumbered financial assets at fair value, other than securities borrowed or purchased under resale agreements and positive market value from derivatives, and available for sale investments are all assumed to be readily available.

The readily available value represents the on- and off-balance sheet carrying amount or fair value rather than any form of stressed liquidity value (see the "Liquidity Reserves" for an analysis of unencumbered liquid assets available under a liquidity stress scenario). Other unencumbered on- and off-balance sheet assets are those assets that have not been pledged as collateral against secured funding or other collateralized obligations, or are otherwise not considered to be readily available. Included in this category are securities borrowed or purchased under resale agreements and positive market value from derivatives. Similarly, for loans and other advances to customers, these would only be viewed as readily available to the extent they are already in a pre-packaged transferrable format, and have not already been used to generate funding. This represents the most conservative view given that an element of such loans currently shown in Other assets could be packaged into a format that would be suitable for use to generate funding.

Encumbered and unencumbered assets

in € bn. (unless stated otherwise)	Dec 31, 2022			
	Carrying value			
	Unencumbered assets			
	Assets	Encumbered assets	Readily available	Other
Debt securities	136	59	77	0
Equity instruments	3	1	2	0
Other assets:				
Cash and due from banks & Interest earning deposits with Banks	186	14	172	0
Securities borrowed or purchased under resale agreements ¹	11	0	0	11
Financial assets at fair value through profit and loss ²				
Trading assets	8	0	8	0
Positive market value from derivative financial instruments	300	0	0	300
Securities borrowed or purchased under resale agreements ¹	82	0	0	82
Other financial assets at fair value through profit or loss	1	0	1	0
Financial assets at fair value through other comprehensive income ²	6	0	4	2
Loans	525	74	14	438
Other assets	80	47	0	33
Total	1,339	194	279	866

¹ Securities borrowed and securities purchased under resale agreements are all shown as other unencumbered. The use of the underlying collateral is separately captured in the off-balance sheet table below.

² Excludes Debt securities and Equity instruments (separately disclosed above).

in € bn. (unless stated otherwise)	Dec 31, 2022			
	Fair value of collateral received			
	Unencumbered assets			
	Assets	Encumbered assets	Readily available	Other
Collateral received:	310	254	48	6
Debt securities	299	250	48	0
Equity instruments	2	1	0	0
Other collateral received	9	3	0	6

in € bn. (unless stated otherwise)	Dec 31, 2021			
	Carrying value			
	Unencumbered assets			
	Assets	Encumbered assets	Readily available	Other
Debt securities	131	66	65	0
Equity instruments	6	1	5	0
Other assets:				
Cash and due from banks & Interest earning deposits with Banks	199	14	186	0
Securities borrowed or purchased under resale agreements ¹	8	0	0	8
Financial assets at fair value through profit and loss ²				
Trading assets	10	0	10	0
Positive market value from derivative financial instruments	300	0	0	300
Securities borrowed or purchased under resale agreements ¹	78	0	0	78
Other financial assets at fair value through profit or loss	1	0	1	0
Financial assets at fair value through other comprehensive income ²	6	0	4	1
Loans	513	86	6	420
Other assets	73	45	0	28
Total	1,325	212	277	836

¹ Securities borrowed and securities purchased under resale agreements are all shown as other unencumbered. The use of the underlying collateral is separately captured in the off-balance sheet table below.

² Excludes Debt securities and Equity instruments (separately disclosed above).

in € bn. (unless stated otherwise)	Dec 31, 2021			
	Fair value of collateral received			
	Unencumbered assets			
	Assets	Encumbered assets	Readily available	Other
Collateral received:	260	223	35	2
Debt securities	254	219	35	0
Equity instruments	4	4	0	0
Other collateral received	2	0	0	2

Maturity Analysis of Assets and Financial Liabilities

Treasury manages the maturity analysis of assets and liabilities. Modeling of assets and liabilities is necessary in cases where the contractual maturity does not adequately reflect the liquidity risk position. The most significant example in this context would be immediately repayable deposits from retail and transaction banking customers which have consistently displayed high stability throughout even the most severe financial crises.

The modeling profiles are part of the overall liquidity risk management framework (see section “Liquidity Stress Testing and Scenario Analysis” for short-term liquidity positions ≤ 1 year and section “Structural Funding” for long-term liquidity positions > 1 year) which is defined and approved by the Management Board.

The following tables present a maturity analysis of total assets based on carrying value and upon earliest legally exercisable maturity as of December 31, 2022 and 2021, respectively.

Analysis of the earliest contractual maturity of assets

Dec 31, 2022

in € m.	On demand (incl. Overnight and one day notice)	Up to one month	Over 1 month to no more than 3 months	Over 3 months but no more than 6 months	Over 6 months but no more than 9 months	Over 9 months but no more than 1 year	Over 1 year but no more than 2 years	Over 2 years but no more than 5 years	Over 5 years	Total
Cash and central bank balances ¹	164,090	13,138	1,639	0	0	29	0	0	0	178,897
Interbank balances (w/o central banks) ¹	6,315	265	181	83	166	181	0	0	6	7,195
Central bank funds sold	0	0	0	0	0	0	0	0	0	0
Securities purchased under resale agreements	9	2,646	3,990	356	519	895	1,721	1,342	0	11,478
With banks	3	305	869	22	5	600	1,626	1,322	0	4,750
With customers	6	2,342	3,121	334	514	295	95	21	0	6,728
Securities borrowed	0	0	0	0	0	0	0	0	0	0
With banks	0	0	0	0	0	0	0	0	0	0
With customers	0	0	0	0	0	0	0	0	0	0
Financial assets at fair value through profit or loss	411,151	47,537	6,495	3,577	3,381	3,973	2,130	655	3,646	482,545
Trading assets	91,150	0	0	0	0	1,437	0	0	280	92,867
Fixed-income securities and loans	88,153	0	0	0	0	0	0	0	4	88,156
Equities and other variable-income securities	2,098	0	0	0	0	1,437	0	0	276	3,811
Other trading assets	900	0	0	0	0	0	0	0	0	900
Positive market values from derivative financial instruments	299,856	0	0	0	0	0	0	0	0	299,856
Non-trading financial assets mandatory at fair value through profit or loss	20,145	47,537	6,495	3,577	3,381	2,443	2,130	582	3,365	89,654
Securities purchased under resale agreements	7,623	42,880	4,868	2,274	3,142	1,647	1,207	215	0	63,855
Securities borrowed	12,445	3,594	1,167	202	0	0	7	0	0	17,414
Fixed-income securities and loans	77	390	460	1,096	239	153	810	328	2,842	6,396
Other non-trading financial assets mandatory at fair value through profit or loss	0	673	0	4	0	643	106	39	523	1,989
Financial assets designated at fair value through profit or loss	0	0	0	0	0	94	0	74	1	168
Positive market values from derivative financial instruments qualifying for hedge accounting	0	260	441	225	88	48	14	62	110	1,248
Financial assets at fair value through other comprehensive income	3	3,857	1,557	803	696	380	1,606	11,093	11,681	31,675
Securities purchased under resale agreements	0	2,156	0	0	0	0	0	0	0	2,156
Securities borrowed	0	0	0	0	0	0	0	0	0	0
Debt securities	0	1,305	883	426	413	184	1,088	9,570	11,581	25,450
Loans	3	396	673	377	283	195	518	1,523	100	4,069
Other	0	0	0	0	0	0	0	0	0	0
Loans	18,559	36,483	28,590	19,767	10,310	12,875	39,165	99,180	226,246	491,175
To banks	199	530	415	490	154	178	2,157	2,119	906	7,148
To customers	18,360	35,952	28,175	19,277	10,156	12,697	37,008	97,061	225,340	484,027
Retail	3,040	8,951	5,077	1,760	1,344	1,389	5,222	16,190	176,847	219,819
Corporates and other customers	15,320	27,001	23,098	17,517	8,813	11,308	31,786	80,871	48,493	264,208
Other financial assets	66,077	9,465	2,339	3,385	1,155	3,549	3,488	4,134	16,595	110,187
Total financial assets	666,203	113,650	45,231	28,196	16,316	21,930	48,123	116,467	258,283	1,314,399
Other assets	9,112	754	2	3,592	5	3,442	231	1,270	11,410	29,818
Total assets	675,315	114,404	45,232	31,788	16,321	25,372	48,354	117,737	269,693	1,344,217

¹ The positions "Cash and central bank balances" and "Interbank balances (w/o central banks)" include € 761 million cash held with Russian Banks, predominantly with the Central Bank of Russia.

Dec 31, 2021

in € m.	On demand (incl. Overnight and one day notice)	Up to one month	Over 1 month to no more than 3 months	Over 3 months but no more than 6 months	Over 6 months but no more than 9 months	Over 9 months but no more than 1 year	Over 1 year but no more than 2 years	Over 2 years but no more than 5 years	Over 5 years	Total
Cash and central bank balances ¹	186,020	5,513	488	0	0	0	0	0	0	192,021
Interbank balances (w/o central banks) ¹	6,153	641	191	120	119	114	0	0	4	7,342
Central bank funds sold	0	0	0	0	0	0	0	0	0	0
Securities purchased under resale agreements	178	1,979	2,042	569	992	144	831	1,633	0	8,368
With banks	168	1,375	740	303	277	8	629	1,611	0	5,111
With customers	10	604	1,302	266	715	136	202	23	0	3,257
Securities borrowed	0	63	0	0	0	0	0	0	0	63
With banks	0	0	0	0	0	0	0	0	0	0
With customers	0	63	0	0	0	0	0	0	0	63
Financial assets at fair value through profit or loss	420,972	47,776	7,155	2,514	1,190	3,577	747	1,966	5,336	491,233
Trading assets	100,079	0	76	0	0	1,815	0	4	423	102,396
Fixed-income securities and loans	94,607	0	0	0	0	0	0	0	130	94,737
Equities and other variable-income securities	4,801	0	76	0	0	1,815	0	4	293	6,989
Other trading assets	671	0	0	0	0	0	0	0	0	671
Positive market values from derivative financial instruments	299,732	0	0	0	0	0	0	0	0	299,732
Non-trading financial assets mandatory at fair value through profit or loss	21,155	47,776	7,079	2,514	1,142	1,762	663	1,962	4,912	88,965
Securities purchased under resale agreements	6,373	44,027	5,850	1,934	895	202	56	594	0	59,931
Securities borrowed	14,777	2,829	663	86	0	0	0	0	0	18,355
Fixed-income securities and loans	5	198	374	415	242	726	437	1,228	4,125	7,750
Other non-trading financial assets mandatory at fair value through profit or loss	0	722	193	79	4	834	170	140	787	2,929
Financial assets designated at fair value through profit or loss	6	0	0	0	48	0	84	1	1	140
Positive market values from derivative financial instruments qualifying for hedge accounting	0	124	57	103	11	92	25	223	469	1,105
Financial assets at fair value through other comprehensive income	0	2,188	1,897	1,281	890	738	2,236	5,970	13,778	28,979
Securities purchased under resale agreements	0	1,231	0	0	0	0	0	0	0	1,231
Securities borrowed	0	0	0	0	0	0	0	0	0	0
Debt securities	0	502	950	689	532	626	1,772	4,560	13,746	23,377
Loans	0	455	947	593	358	112	464	1,410	32	4,370
Other	0	0	0	0	0	0	0	0	0	0
Loans	16,962	40,041	27,994	23,938	11,882	12,448	29,518	89,736	219,550	472,069
To banks	282	885	899	503	274	183	441	3,387	753	7,607
To customers	16,680	39,156	27,095	23,435	11,608	12,265	29,077	86,349	218,797	464,462
Retail	2,782	5,893	4,262	2,092	1,071	2,209	4,337	16,256	171,602	210,504
Corporates and other customers	13,898	33,263	22,833	21,343	10,537	10,056	24,740	70,093	47,195	253,958
Other financial assets	65,378	7,742	1,223	1,206	1,322	3,306	4,879	3,968	8,022	97,046
Total financial assets	695,662	106,067	41,048	29,731	16,406	20,419	38,237	103,497	247,159	1,298,226
Other assets	8,407	1,258	1	2,118	31	2,576	130	1,372	10,585	26,479
Total assets	704,069	107,325	41,049	31,850	16,437	22,995	38,367	104,869	257,744	1,324,705

¹ The positions "Cash and central bank balances" and "Interbank balances (w/o central banks)" include € 526 million cash held with Russian Banks, predominantly with the Central Bank of Russia.

The following tables present a maturity analysis of total liabilities based on carrying value and upon earliest legally exercisable maturity as of December 31, 2022 and 2021, respectively.

Analysis of the earliest contractual maturity of liabilities

Dec 31, 2022

in € m.	On demand (incl. Over-night and one day notice)	Up to one month	Over 1 month to no more than 3 months	Over 3 months but no more than 6 months	Over 6 months but no more than 9 months	Over 9 months but no more than 1 year	Over 1 year but no more than 2 years	Over 2 years but no more than 5 years	Over 5 years	Total
Deposits	385,715	34,971	97,284	55,043	16,398	14,816	7,638	7,975	9,344	629,183
Due to banks	41,570	1,052	9,089	8,984	6,248	1,592	2,965	5,699	7,853	85,053
Due to customers	344,145	33,919	88,196	46,059	10,150	13,224	4,673	2,276	1,491	544,131
Retail	155,180	5,491	58,382	28,637	1,334	1,273	943	579	84	251,903
Corporates and other customers	188,965	28,428	29,813	17,422	8,816	11,951	3,730	1,697	1,407	292,228
Trading liabilities	333,035	0	0	0	0	0	0	0	0	333,035
Trading securities	49,860	0	0	0	0	0	0	0	0	49,860
Other trading liabilities	756	0	0	0	0	0	0	0	0	756
Negative market values from derivative financial instruments	282,418	0	0	0	0	0	0	0	0	282,418
Financial liabilities designed at fair value through profit or loss	9,686	27,208	10,285	2,175	774	388	852	2,355	911	54,634
Securities sold under repurchase agreements	7,484	27,026	10,131	2,028	658	228	554	351	55	48,517
Long-term debt	1,740	60	64	116	113	115	292	1,895	854	5,250
Other financial liabilities designated at fair value through profit or loss	462	122	90	31	2	45	6	109	2	868
Investment contract liabilities	0	0	0	0	0	469	0	0	0	469
Negative market values from derivative financial instruments qualifying for hedge accounting	0	144	181	93	78	15	28	33	149	721
Central bank funds purchased	0	0	0	0	0	0	0	0	0	0
Securities sold under repurchase agreements	170	182	144	20	0	0	25	16	15	573
Due to banks	59	101	122	3	0	0	0	0	9	293
Due to customers	111	81	23	17	0	0	25	16	6	279
Securities loaned	12	0	0	0	0	0	0	0	0	13
Due to banks	1	0	0	0	0	0	0	0	0	1
Due to customers	12	0	0	0	0	0	0	0	0	12
Other short term borrowings	3,002	1,878	135	34	9	61	0	0	0	5,118
Long-term debt	0	3,085	27,434	6,756	4,994	4,355	17,537	43,826	23,539	131,525
Debt securities - senior	0	3,050	2,068	2,510	3,206	3,791	13,091	35,427	15,413	78,556
Debt securities - subordinated	0	0	25	1,309	0	0	36	7,095	2,670	11,135
Other long-term debt - senior	0	34	25,340	2,882	1,770	501	4,385	1,242	5,433	41,588
Other long-term debt - subordinated	0	0	0	55	18	63	25	62	23	245
Trust Preferred Securities	0	0	0	500	0	0	0	0	0	500
Other financial liabilities	90,316	776	996	470	160	1,779	723	1,136	2,517	98,873
Total financial liabilities	821,936	68,243	136,460	65,092	22,411	21,883	26,802	55,341	36,475	1,254,643
Other liabilities	17,433	0	0	0	0	0	0	0	0	17,433
Total equity	0	0	0	0	0	0	0	0	72,141	72,141
Total liabilities and equity	839,369	68,243	136,460	65,092	22,411	21,883	26,802	55,341	108,616	1,344,217
Off-balance sheet commitments given	45,318	11,115	15,621	22,407	12,160	24,447	43,057	105,306	38,803	318,234
Banks	1,150	1,021	1,561	1,886	1,894	2,366	2,748	2,634	4,955	20,214
Retail	15,916	820	1,005	335	608	2,212	875	727	8,900	31,398
Corporates and other customers	28,253	9,274	13,055	20,186	9,659	19,869	39,434	101,945	24,948	266,622

Dec 31, 2021

in € m.	On demand (incl. Over-night and one day notice)	Up to one month	Over 1 month to no more than 3 months	Over 3 months but no more than 6 months	Over 6 months but no more than 9 months	Over 9 months but no more than 1 year	Over 1 year but no more than 2 years	Over 2 years but no more than 5 years	Over 5 years	Total
Deposits	393,897	23,033	95,474	49,687	10,775	10,057	4,726	7,095	9,652	604,396
Due to banks	42,195	2,312	8,091	9,328	5,619	1,637	2,374	5,105	7,652	84,315
Due to customers	351,702	20,721	87,383	40,359	5,156	8,420	2,352	1,989	1,999	520,081
Retail	158,038	3,040	59,964	28,293	889	745	416	495	127	252,006
Corporates and other customers	193,664	17,681	27,419	12,066	4,267	7,675	1,936	1,494	1,873	268,075
Trading liabilities	341,827	0	0	0	0	0	0	0	0	341,827
Trading securities	54,235	0	0	0	0	0	0	0	0	54,235
Other trading liabilities	483	0	0	0	0	0	0	0	0	483
Negative market values from derivative financial instruments	287,109	0	0	0	0	0	0	0	0	287,109
Financial liabilities designed at fair value through profit or loss	12,038	22,809	4,219	648	13,987	2,114	376	1,497	780	58,468
Securities sold under repurchase agreements	10,802	22,069	4,077	548	13,855	1,950	1	3	58	53,364
Long-term debt	1,008	0	35	36	87	59	368	1,439	667	3,699
Other financial liabilities designated at fair value through profit or loss	228	740	106	64	44	105	7	54	56	1,404
Investment contract liabilities	0	0	0	0	0	562	0	0	0	562
Negative market values from derivative financial instruments qualifying for hedge accounting	0	317	362	187	188	48	34	252	79	1,466
Central bank funds purchased	0	0	0	0	0	0	0	0	0	0
Securities sold under repurchase agreements	226	2	30	39	1	0	440	2	8	747
Due to banks	218	1	28	37	1	0	440	0	3	727
Due to customers	8	2	2	2	0	0	0	2	5	21
Securities loaned	24	0	0	0	0	0	0	0	0	24
Due to banks	6	0	0	0	0	0	0	0	0	6
Due to customers	18	0	0	0	0	0	0	0	0	18
Other short term borrowings	2,676	639	114	536	2	67	0	0	0	4,034
Long-term debt	0	1,838	31,616	10,889	1,452	3,637	17,832	48,166	29,054	144,485
Debt securities - senior	0	1,772	3,287	2,934	1,345	2,849	12,901	34,760	21,780	81,629
Debt securities - subordinated	0	0	14	0	0	0	1,231	4,879	2,479	8,603
Other long-term debt - senior	0	66	28,315	7,955	93	788	3,597	8,397	4,749	53,960
Other long-term debt - subordinated	0	0	0	0	15	0	103	130	46	293
Trust Preferred Securities	0	0	0	264	0	264	0	0	0	528
Other financial liabilities	78,320	1,358	1,988	329	171	284	762	1,235	1,828	86,274
Total financial liabilities	829,009	49,996	133,803	62,580	26,576	17,033	24,169	58,245	41,401	1,242,811
Other liabilities	13,795	0	0	0	0	0	0	0	0	13,795
Total equity	0	0	0	0	0	0	0	0	68,099	68,099
Total liabilities and equity	842,804	49,996	133,803	62,580	26,576	17,033	24,169	58,245	109,499	1,324,705
Off-balance sheet commitments given ¹	42,737	11,379	15,969	18,800	8,712	24,010	34,770	99,808	37,641	293,825
Banks	1,243	1,538	2,018	2,115	1,502	2,555	2,180	3,167	4,592	20,910
Retail	16,057	783	683	163	165	2,058	257	822	10,258	31,244
Corporates and other customers	25,437	9,058	13,267	16,523	7,045	19,397	32,334	95,819	22,790	241,670

¹Prior year's comparatives aligned to presentation in the current year.

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Employees

Group Headcount

As of December 31, 2022, the bank employed a total of 84,930 staff members compared to 82,969 as of December 31, 2021. The bank calculates its employee figures on a full-time equivalent basis, meaning it includes proportionate numbers of part-time employees.

The following table shows the bank's numbers of full-time equivalent employees as of December 31, 2022, 2021 and 2020.

Employees ¹	Dec 31, 2022	Dec 31, 2021	Dec 31, 2020
Germany	35,594	35,741	37,315
Europe (outside Germany), Middle East and Africa	18,379	19,311	19,617
Asia/Pacific	23,236	20,215	19,430
North America ²	7,534	7,556	8,149
Latin America	187	145	148
Total employees	84,930	82,969	84,659

¹ Full-time equivalent employees, numbers may not add up due to rounding

² Primarily the United States

In 2022, the number of the bank's employees increased by 1,961 or 2.4% mainly due to business growth, strengthening the IT function and internalizations.

- Germany (-147; -0.4%) driven by the implementation of restructuring measures, primarily in Private Bank partly offset by transfers of workforce from Russia
- North America (-23; -0.3%) mainly driven by reductions in the Corporate Bank
- Latin America (+42; +29.0%) mainly driven by increases in Brazil
- EMEA ex Germany (-933; -4.8%) mainly driven by the reduction of the bank's presence in Russia
- Asia/Pacific (+3,021; +14.9%) primarily driven by increases in India and its Operations Center

The following table shows the distribution of full-time equivalent employees by division as of December 31, 2022, 2021 and 2020.

Employees	Dec 31, 2022	Dec 31, 2021	Dec 31, 2020
Corporate Bank (CB)	16.5 %	16.0 %	15.8 %
Investment Bank (IB)	9.0 %	8.6 %	8.9 %
Private Bank (PB)	31.7 %	33.8 %	35.1 %
Asset Management (AM)	5.0 %	4.9 %	4.6 %
Capital Release Unit (CRU)	0.2 %	0.3 %	0.6 %
Infrastructure	37.5 %	36.3 %	35.0 %

¹ Numbers may not add up due to rounding

- Corporate Bank (+688; +5.2%) mainly driven by increases in Operations and Control Functions
- Investment Bank (+505; +7.1%) mainly driven by increases in Operations and Control Functions as well as in Fixed Income
- Private Bank (-1,132; -4.0%) mainly driven by reductions in Germany
- Asset Management (+211; +5.2%) primarily driven by increases in UK, Germany and in Asia/Pacific
- Capital Release Unit (-73; -27.2%) mainly driven by reductions in UK
- Infrastructure functions (+1,762; +5.9%) primarily driven by increases in Technology Data & Innovation (+1,168) mainly driven by insourcing of business critical external roles

Post-Employment Benefit Plans

The Group sponsors a number of post-employment benefit plans on behalf of the Group's employees, both defined contribution plans and defined benefit plans.

In the Group's globally coordinated accounting process covering defined benefit plans with a defined benefit obligation exceeding € 2 million the Group's global actuary reviews the valuations provided by locally appointed actuaries in each country.

By applying the Group's global principles for determining the financial and demographic assumptions the Group ensures that the assumptions are best-estimate, unbiased and mutually compatible, and that they are globally consistent.

For a further discussion on the Group's employee benefit plans see Note 33 "Employee Benefits" to the Group's consolidated financial statements.

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Consolidated Statement of Income

in € m.	Notes	2022	2021	2020
Interest and similar income ¹	5	24,449	16,773	17,954
Interest expense	5	10,466	5,655	6,405
Net interest income	5	13,983	11,117	11,548
Provision for credit losses	19	1,226	515	1,792
Net interest income after provision for credit losses		12,757	10,602	9,756
Commissions and fee income	6	9,838	10,934	9,424
Net gains (losses) on financial assets/liabilities at fair value through profit or loss	5	2,962	3,139	2,332
Net gains (losses) from derecognition of financial assets measured at amortized cost	7	(2)	1	311
Net gains (losses) on financial assets at fair value through other comprehensive income		(216)	237	323
Net income (loss) from equity method investments	16	152	98	120
Other income (loss)	8	346	13	(48)
Total noninterest income		13,080	14,421	12,463
Compensation and benefits	33	10,712	10,418	10,471
General and administrative expenses	9	9,728	10,821	10,259
Impairment of goodwill and other intangible assets	23	68	5	0
Restructuring activities	10	(118)	261	485
Total noninterest expenses		20,390	21,505	21,216
Profit (loss) before income taxes		5,447	3,518	1,003
Income tax expense (benefit)	34	(107)	923	391
Profit (loss)		5,554	2,595	612
Profit (loss) attributable to noncontrolling interests		134	144	129
Profit (loss) attributable to Deutsche Bank shareholders and additional equity components		5,420	2,451	483

¹ Interest and similar income included € 19.8 billion, € 13.4 billion and € 14.1 billion for the year ended December 31, 2022, 2021 and 2020, respectively, calculated based on effective interest method.

Earnings per Share

	Notes	2022	2021	2020
Earnings per share:¹	11			
Basic		€ 2.37	€ 1.00	€ 0.06
Diluted		€ 2.32	€ 0.97	€ 0.06
Number of shares in million:				
Denominator for basic earnings per share – weighted-average shares outstanding		2,084.9	2,096.5	2,108.2
Denominator for diluted earnings per share – adjusted weighted-average shares after assumed conversions		2,125.6	2,143.2	2,170.1

¹ Earnings were adjusted by € 479 million, € 363 million and € 349 million before tax for the coupons paid on Additional Tier 1 Notes in April 2022, April 2021 and April 2020. In accordance with IAS 33 the coupons paid on Additional Tier 1 Notes are not attributable to Deutsche Bank shareholders and therefore need to be deducted in the calculation.

The accompanying notes are an integral part of the Consolidated Financial Statements.

Consolidated Statement of Comprehensive Income

in € m.	2022	2021	2020
Profit (loss) recognized in the income statement	5,554	2,595	612
Other comprehensive income			
Items that will not be reclassified to profit or loss			
Remeasurement gains (losses) related to defined benefit plans, before tax	1,203	804	149
Net fair value gains (losses) attributable to credit risk related to financial liabilities designated as at fair value through profit or loss, before tax	91	(15)	(24)
Total of income tax related to items that will not be reclassified to profit or loss	(667)	(202)	82
Items that are or may be reclassified to profit or loss			
Financial assets at fair value through other comprehensive income			
Unrealized net gains (losses) arising during the period, before tax	(1,496)	(351)	676
Realized net (gains) losses arising during the period (reclassified to profit or loss), before tax	216	(237)	(323)
Derivatives hedging variability of cash flows			
Unrealized net gains (losses) arising during the period, before tax	(819)	1	(14)
Realized net (gains) losses arising during the period (reclassified to profit or loss), before tax	71	(54)	4
Assets classified as held for sale			
Unrealized net gains (losses) arising during the period, before tax	0	0	0
Realized net (gains) losses arising during the period (reclassified to profit or loss), before tax	0	0	0
Foreign currency translation			
Unrealized net gains (losses) arising during the period, before tax	331	1,117	(1,819)
Realized net (gains) losses arising during the period (reclassified to profit or loss), before tax	(20)	(14)	6
Equity Method Investments			
Net gains (losses) arising during the period	20	(5)	1
Total of income tax related to items that are or may be reclassified to profit or loss	654	286	(122)
Other comprehensive income (loss), net of tax	(417)	1,329	(1,385)
Total comprehensive income (loss), net of tax	5,137	3,924	(774)
Attributable to:			
Noncontrolling interests	185	212	59
Deutsche Bank shareholders and additional equity components	4,952	3,713	(833)

The accompanying notes are an integral part of the Consolidated Financial Statements.

Consolidated Balance Sheet

in € m.	Notes	Dec 31, 2022	Dec 31, 2021
Assets:			
Cash and central bank balances		178,896	192,021
Interbank balances (w/o central banks)		7,195	7,342
Central bank funds sold and securities purchased under resale agreements	20	11,478	8,368
Securities borrowed	20	0	63
Financial assets at fair value through profit or loss			
Trading assets		92,867	102,396
Positive market values from derivative financial instruments		299,856	299,732
Non-trading financial assets mandatory at fair value through profit and loss		89,654	88,965
Financial assets designated at fair value through profit or loss		168	140
Total financial assets at fair value through profit or loss	12, 13, 20, 35	482,545	491,233
Financial assets at fair value through other comprehensive income	15	31,675	28,979
Equity method investments	16	1,124	1,091
Loans at amortized cost	18, 19, 20	491,175	472,069
Property and equipment	21, 22	6,103	5,536
Goodwill and other intangible assets	23	7,092	6,824
Other assets ¹	24, 25	118,124	103,784
Assets for current tax		1,584	1,214
Deferred tax assets	34	7,225	6,180
Total assets		1,344,217	1,324,705
Liabilities and equity:			
Deposits	26	629,183	604,396
Central bank funds purchased and securities sold under repurchase agreements	20	573	747
Securities loaned	20	13	24
Financial liabilities at fair value through profit or loss			
Trading liabilities		50,616	54,718
Negative market values from derivative financial instruments		282,418	287,109
Financial liabilities designated at fair value through profit or loss		54,634	58,468
Investment contract liabilities		469	562
Total financial liabilities at fair value through profit or loss	12, 13, 20, 35	388,138	400,857
Other short-term borrowings	29	5,122	4,034
Other liabilities ¹	22, 24, 25	113,648	97,795
Provisions	19, 27	2,449	2,641
Liabilities for current tax		388	600
Deferred tax liabilities	34	538	498
Long-term debt	30	131,525	144,485
Trust preferred securities	30	500	528
Total liabilities		1,272,076	1,256,606
Common shares, no par value, nominal value of € 2.56	32	5,291	5,291
Additional paid-in capital		40,513	40,580
Retained earnings		17,769	12,680
Common shares in treasury, at cost	32	(331)	(6)
Accumulated other comprehensive income (loss), net of tax		(1,470)	(449)
Total shareholders' equity		61,772	58,096
Additional equity components		8,578	8,305
Noncontrolling interests		1,791	1,698
Total equity		72,141	68,099
Total liabilities and equity		1,344,217	1,324,705

¹ Includes non-current assets and disposal groups held for sale.

The accompanying notes are an integral part of the Consolidated Financial Statements.

Consolidated Statement of Changes in Equity

in € m.	Unrealized net gains (losses)														
	Common shares (no par value)	Additional paid-in capital	Retained earnings	Common shares in treasury, at cost	On financial assets at fair value through other compre- hensive income, net of tax ²	Attributable to change in own credit risk of financial liabilities designated as at fair value through profit and loss, net of tax ²	On derivatives hedging variability of cash flows, net of tax ²	On assets classified as held for sale, net of tax ²	Foreign currency translation, net of tax ²	Unrealized net gains (losses) from equity method investments	Accumula- ted other comprehen- sive income, net of tax ¹	Total shareholders' equity	Additional equity components ³	Noncontrolling interests	Total equity
Balance as of December 31, 2019	5,291	40,505	9,644	(4)	45	25	14	0	336	0	421	55,857	4,665	1,638	62,160
Total comprehensive income (loss), net of tax ¹	0	0	483	0	233	(18)	(7)	0	(1,747)	(1)	(1,539)	(1,056)	0	57	(999)
Gains (losses) attributable to equity instruments designated as at fair value through other comprehensive income, net of tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gains (losses) upon early extinguishment attributable to change in own credit risk of financial liabilities designated as at fair value through profit and loss, net of tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash dividends paid	0	0	0	0	0	0	0	0	0	0	0	0	0	(77)	(77)
Coupon on additional equity components, before tax	0	0	(349)	0	0	0	0	0	0	0	0	(349)	0	0	(349)
Remeasurement gains (losses) related to defined benefit plans, net of tax	0	0	223	0	0	0	0	0	0	0	0	223	0	2	225
Net change in share awards in the reporting period	0	(131)	0	0	0	0	0	0	0	0	0	(131)	0	(4)	(135)
Treasury shares distributed under share-based compensation plans	0	0	0	208	0	0	0	0	0	0	0	208	0	0	208
Tax benefits related to share-based compensation plans	0	11	0	0	0	0	0	0	0	0	0	11	0	0	11
Option premiums and other effects from options on common shares	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purchases of treasury shares	0	0	0	(279)	0	0	0	0	0	0	0	(279)	0	0	(279)
Sale of treasury shares	0	0	0	68	0	0	0	0	0	0	0	68	0	0	68
Net gains (losses) on treasury shares sold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	221	0	0	0	0	0	0	0	0	0	221	1,159 ⁴	(28)	1,352
Balance as of December 31, 2020	5,291	40,606	10,002	(7)	278	7	7	0	(1,411)	(1)	(1,118)	54,774	5,824	1,587	62,184
Total comprehensive income (loss), net of tax ¹	0	0	2,451	0	(403)	(13)	(40)	0	1,128	(5)	667	3,118	0	207	3,325
Gains (losses) attributable to equity instruments designated as at fair value through other comprehensive income, net of tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gains (losses) upon early extinguishment attributable to change in own credit risk of financial liabilities designated as at fair value through profit and loss, net of tax	0	0	(2)	0	0	2	0	0	0	0	2	0	0	0	0
Cash dividends paid	0	0	0	0	0	0	0	0	0	0	0	0	0	(85)	(85)
Coupon on additional equity components, before tax	0	0	(363)	0	0	0	0	0	0	0	0	(363)	0	0	(363)
Remeasurement gains (losses) related to defined benefit plans, net of tax	0	0	592	0	0	0	0	0	0	0	0	592	0	4	597
Net change in share awards in the reporting period	0	(99)	0	0	0	0	0	0	0	0	0	(99)	0	(2)	(101)
Treasury shares distributed under share-based compensation plans	0	0	0	312	0	0	0	0	0	0	0	312	0	0	312
Tax benefits related to share-based compensation plans	0	29	0	0	0	0	0	0	0	0	0	29	0	0	29
Option premiums and other effects from options on common shares	0	(50)	0	0	0	0	0	0	0	0	0	(50)	0	0	(50)
Purchases of treasury shares	0	0	0	(346)	0	0	0	0	0	0	0	(346)	0	0	(346)
Sale of treasury shares	0	0	0	35	0	0	0	0	0	0	0	35	0	0	35
Net gains (losses) on treasury shares sold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	94	0	0	0	0	0	0	0	0	0	94	2,481 ⁴	(13)	2,562
Balance as of December 31, 2021	5,291	40,580	12,680	(6)	(124)	(3)	(33)	0	(282)	(6)	(449)	58,096	8,305	1,698	68,099
Total comprehensive income (loss), net of tax ¹	0	0	5,420	0	(1,019)	65	(537)	0	454	16	(1,020)	4,399	0	177	4,576
Gains (losses) attributable to equity instruments designated as at fair value through other comprehensive income, net of tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gains (losses) upon early extinguishment attributable to change in own credit risk of financial liabilities designated as at fair value through profit and loss, net of tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash dividends paid	0	0	(406)	0	0	0	0	0	0	0	0	(406)	0	(96)	(502)
Coupon on additional equity components, before tax	0	0	(479)	0	0	0	0	0	0	0	0	(479)	0	0	(479)
Remeasurement gains (losses) related to defined benefit plans, net of tax	0	0	553	0	0	0	0	0	0	0	0	553	0	8	561
Net change in share awards in the reporting period	0	(48)	0	0	0	0	0	0	0	0	0	(48)	0	(1)	(49)
Treasury shares distributed under share-based compensation plans	0	0	0	370	0	0	0	0	0	0	0	370	0	0	370
Tax benefits related to share-based compensation plans	0	17	0	0	0	0	0	0	0	0	0	17	0	0	17
Option premiums and other effects from options on common shares	0	(58)	0	0	0	0	0	0	0	0	0	(58)	0	0	(58)
Purchases of treasury shares	0	0	0	(695)	0	0	0	0	0	0	0	(695)	0	0	(695)
Sale of treasury shares	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net gains (losses) on treasury shares sold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	22	1	0	0	0	0	0	0	0	0	24	273 ⁴	5	301
Balance as of December 31, 2022	5,291	40,513	17,769	(331)	(1,143)	62	(570)	0	172	10	(1,470)	61,772	8,578	1,791	72,141

¹ Excluding remeasurement gains (losses) related to defined benefit plans, net of tax.

² Excluding unrealized net gains (losses) from equity method investments.

³ Includes Additional Tier 1 Notes, which constitute unsecured and subordinated notes of Deutsche Bank and are classified as equity in accordance with IFRS.

⁴ Includes net proceeds from issuance, purchase and sale of Additional Equity Components.

Consolidated Statement of Cash Flows

in € m.	2022	2021	2020
Net Income (loss)	5,554	2,595	612
Cash flows from operating activities:			
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Provision for credit losses	1,226	515	1,792
Restructuring activities	(118)	261	485
Gain on sale of financial assets at fair value through other comprehensive income, equity method investments and other	128	(276)	(665)
Deferred income taxes, net	(894)	62	(302)
Impairment, depreciation and other amortization, and accretion	3,338	3,169	1,896
Share of net income from equity method investments	(129)	(197)	(103)
Income (loss) adjusted for noncash charges, credits and other items	9,104	6,129	3,716
Adjustments for net change in operating assets and liabilities:			
Interest-earning time deposits with central banks and banks	102	97	(1,202)
Central bank funds sold, securities purchased under resale agreements, securities borrowed	(3,046)	102	5,688
Non-Trading financial assets mandatory at fair value through profit and loss	1,511	(12,124)	8,597
Financial assets designated at fair value through profit or loss	(31)	309	(430)
Loans at amortized cost	(12,059)	(42,707)	(780)
Other assets	(459)	8,046	(11,743)
Deposits	19,191	34,625	(2,159)
Financial liabilities designated at fair value through profit or loss and investment contract liabilities ¹	(6,046)	11,144	(3,233)
Central bank funds purchased, securities sold under repurchase agreements, securities loaned	(187)	(3,249)	678
Other short-term borrowings	1,065	477	(1,638)
Other liabilities	12,377	(17,823)	7,030
Senior long-term debt ²	(17,019)	(6,191)	13,282
Trading assets and liabilities, positive and negative market values from derivative financial instruments, net	2,145	19,598	9,854
Other, net	(8,762)	(1,386)	3,075
Net cash provided by (used in) operating activities	(2,113)	(2,952)	30,735
Cash flows from investing activities:			
Proceeds from:			
Sale of financial assets at fair value through other comprehensive income	15,450	52,131	38,325
Maturities of financial assets at fair value through other comprehensive income	21,557	21,424	32,964
Sale of debt securities held to collect at amortized cost	0	67	10,110
Maturities of debt securities held to collect at amortized cost	6,519	5,468	4,890
Sale of equity method investments	118	23	69
Sale of property and equipment	22	114	24
Purchase of:			
Financial assets at fair value through other comprehensive income	(42,991)	(46,801)	(82,709)
Debt Securities held to collect at amortized cost	(16,696)	(7,166)	(4,011)
Equity method investments	(171)	(100)	(3)
Property and equipment	(337)	(550)	(512)
Net cash received in (paid for) business combinations/divestitures	439	(5)	5
Other, net	(1,086)	(1,010)	(1,045)
Net cash provided by (used in) investing activities	(17,175)	23,595	(1,892)
Cash flows from financing activities:			
Issuances of subordinated long-term debt	2,716 ³	1,146	1,684
Repayments and extinguishments of subordinated long-term debt	(90) ³	(42)	(1,168)
Issuances of trust preferred securities	0 ⁴	0	0
Repayments and extinguishments of trust preferred securities	0 ⁴	(504)	(676)
Principal portion of lease payments	(607)	(679)	(653)
Common shares issued	0	0	0
Purchases of treasury shares	(695)	(346)	(279)
Sale of treasury shares	0	35	76
Additional Equity Components (AT1) issued	2,000	2,500	1,153
Additional Equity Components (AT1) repaid	(1,750)	0	0
Purchases of Additional Equity Components (AT1)	(4,058)	(2,662)	(792)
Sale of Additional Equity Components (AT1)	4,074	2,642	798
Coupon on additional equity components, pre tax	(479)	(363)	(349)
Dividends paid to noncontrolling interests	(96)	(85)	(77)
Net change in noncontrolling interests	5	(13)	(28)
Cash dividends paid to Deutsche Bank shareholders	(406)	0	0
Other, net	0	0	0
Net cash provided by (used in) financing activities	614	1,630	(311)
Net effect of exchange rate changes on cash and cash equivalents	4,354	1,345	(1,074)
Net increase (decrease) in cash and cash equivalents	(14,320)	23,618	27,458
Cash and cash equivalents at beginning of period	179,946	156,328	128,869
Cash and cash equivalents at end of period	165,626	179,946	156,328
Net cash provided by (used in) operating activities include			

in € m.	2022	2021	2020
Income taxes paid (received), net	1,288	1,031	805
Interest paid	9,286	5,769	7,062
Interest received	22,817	15,981	18,645
Dividends received	87	364	307
Cash and cash equivalents comprise			
Cash and central bank balances ⁵	159,876	174,089	149,323
Interbank balances (w/o central banks) ⁶	5,749	5,857	7,006
Total	165,626	179,946	156,328

¹ Included are senior long-term debt issuances of € 2.5 billion and € 1.3 billion and repayments and extinguishments of € 738 million and € 1.0 billion through December 31, 2022 and December 31, 2021, respectively.

² Included are issuances of € 36.4 billion and € 33.6 billion and repayments and extinguishments of € 44.2 billion and € 39.5 billion through December 31, 2022 and December 31, 2021, respectively.

³ Non-cash changes for Subordinated Long Term Debt are € (141) million in total and mainly driven by Fair Value changes of € (464) million and Foreign Exchange movements of € 321 million.

⁴ Non-cash changes for Trust Preferred Securities are € (28) million in total and mainly driven by Fair Value changes of € (33) million.

⁵ Not included: Interest-earning time deposits with central banks of € 19.0 billion as of December 31, 2022, € 17.9 billion as of December 31, 2021 and € 16.9 billion as of December 31, 2020.

⁶ Not included: Interest-earning time deposits with banks of € 1.4 billion as of December 31, 2022, € 1.5 billion as of December 31, 2021 and € 2.1 billion as of December 31, 2020.

Cash and central bank balances include time and demand deposits at the Russian Central Bank of € 759 million as of December 31, 2022. These are subject to foreign exchange restrictions. Thereof, demand deposits of € 40 million qualify as Cash and cash equivalents at end of period.

The accompanying notes are an integral part of the Consolidated Financial Statements.

Notes to the consolidated financial statements

01 – Significant accounting policies and critical accounting estimates

Basis of accounting

Deutsche Bank Aktiengesellschaft, Taunusanlage 12, 60325 Frankfurt am Main, Germany ("Deutsche Bank" or the "Parent") is a stock corporation organized under the laws of the Federal Republic of Germany. Deutsche Bank together with all entities in which Deutsche Bank has a controlling financial interest (collectively the "Group" or "Deutsche Bank") is a global provider of a full range of corporate and investment banking, private clients and asset management products and services.

The accompanying consolidated financial statements are stated in euros, the presentation currency of the Group. All financial information presented in million euros has been rounded to the nearest million. The consolidated financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board ("IASB").

Prior to publication on March 17, 2023, the Supervisory Board approved the Consolidated Financial Statements 2022 of the Group on March 16, 2023, which were drawn up by the Management Board on March 9, 2023.

EU carve-out

For purposes of the Group's primary financial reporting outside the United States, the Group prepares its consolidated financial statements in accordance with IFRS as endorsed by the EU. For purposes of the Group's consolidated financial statements prepared in accordance with IFRS as endorsed by the EU, the Group applies fair value hedge accounting for portfolio hedges of interest rate risk (fair value macro hedges) in accordance with the EU carve-out version of IAS 39. The purpose of applying the EU carve-out version of IAS 39 is to align the Group's hedge accounting approach with its risk management practice and the accounting practice of its major European peers. Under the EU carve-out version of IAS 39, fair value macro hedge accounting may be applied to core deposits and hedge ineffectiveness is generally only recognized when the revised estimate of the amount of cash flows in scheduled time buckets falls below the original designated amount of that bucket. If the revised amount of cash flows in scheduled time buckets is more than the original designated amount then there is no hedge ineffectiveness. Under IFRS as issued by the IASB, hedge accounting for fair value macro hedges cannot be applied to core deposits. In addition, under IFRS as issued by the IASB hedge ineffectiveness arises for all fair value macro hedge accounting relationships whenever the revised estimate of the amount of cash flows in scheduled time buckets is either more or less than the original designated amount of that bucket.

For the financial year ended December 31, 2022, the application of the EU carve-out version of IAS 39 had a positive impact of € 147 million on profit before tax and of € 105 million on profit after tax. For the financial year ended December 31, 2021, the application of the EU carve-out had a negative impact of € 128 million on profit before taxes and of € 85 million on profit post taxes.

The Group's regulatory capital and ratios thereof are also reported on the basis of the EU carve-out version of IAS 39. The impact on profit also impacts the calculation of the CET1 capital ratio. For the financial year ended December 31, 2022, application of the EU carve-out had a positive impact on the CET1 capital ratio of about 3 basis points and a negative impact of about 2 basis points for the financial year ended December 31, 2021.

IFRS 7 disclosures (including war in Ukraine and climate risk related disclosures)

Disclosures about the nature and the extent of risks arising from financial instruments as required by IFRS 7, "Financial Instruments: Disclosures" are set forth in the Risk Report section of the Management Report and are an integral part of the Consolidated Financial Statements.

Details on related risks, exposures and the impact on financial instrument impairment (including the use of overlays) from the war in Ukraine disclosures can be found in the sections, "IFRS 9 impairment" and "Exposure to Russia" in the Risk Report.

Disclosures on climate related risk can be found in the sections, "Enterprise Risk Management", line item "Environmental, social and governance risk" in the Risk Report.

These audited disclosures are marked in light blue in the Risk Report.

Change in accounting estimates

In the second quarter 2022, a recalibration of the discount curve for defined benefit plans was applied to the Eurozone curve in order to better align to market data which resulted in a benefit recognized in Other Comprehensive Income of € 310 million.

In the third quarter of 2022, the Group implemented a refinement to its methodology for the own credit adjustment calculation. The refinement means that all of the spread above the benchmark rate is regarded as own credit following its implementation. Previously, the spread was parameterized into a market level of funding component (recognition as a gain or loss in the Group's Consolidated Statement of Income) and an idiosyncratic own credit component (taken through Other Comprehensive Income). The impact from this change in estimate in 2022 was a loss of € 55 million before tax recognized in the Group's Consolidated Statement of Income. The refined approach is expected to result in an own credit valuation methodology that is more consistent with that of peer banks.

Critical accounting estimates

The preparation of financial statements under IFRS requires management to make estimates and assumptions for certain categories of assets and liabilities. These estimates and assumptions affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the balance sheet date, and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from management's estimates. The Group's significant accounting policies are described in "Significant Accounting Policies".

Certain of the Group's accounting policies require critical accounting estimates that involve complex and subjective judgments and the use of assumptions, some of which may be for matters that are inherently uncertain and susceptible to change. Such critical accounting estimates could change from period to period and may have a material impact on the Group's financial condition, changes in financial condition or results of operations. Critical accounting estimates could also involve estimates where management could have reasonably used another estimate in the current accounting period. The Group has identified the following significant accounting policies that involve critical accounting estimates:

- Impairment of associates (see "Associates" below)
- Impairment of financial assets at fair value through other comprehensive income (see "Impairment of Loans and Provision for Off-balance Sheet Positions" below)
- Determination of fair value (see "Determination of Fair Value" below)
- Recognition of trade date profit (see "Recognition of Trade Date Profit" below)
- Impairment of loans and provisions for off-balance sheet positions (see "Impairment of Loans and Provision for Off-balance Sheet Positions" below)
- Impairment of goodwill and other intangibles (see "Goodwill and Other Intangible Assets" below)
- Recognition and measurement of deferred tax assets (see "Income Taxes" below)
- Accounting for legal and regulatory contingencies and uncertain tax positions (see "Provisions" below)

Significant accounting policies

The following is a description of the significant accounting policies of the Group. Except for the changes in accounting policies and changes in accounting estimates described previously and noted below these policies have been consistently applied for 2020, 2021 and 2022.

Principles of consolidation

The financial information in the Consolidated Financial Statements includes the parent company, Deutsche Bank AG, together with its consolidated subsidiaries, including certain structured entities presented as a single economic unit.

Subsidiaries

The Group's subsidiaries are those entities which it directly or indirectly controls. Control over an entity is evidenced by the Group's ability to exercise its power in order to affect any variable returns that the Group is exposed to through its involvement with the entity.

The Group sponsors the formation of structured entities and interacts with structured entities sponsored by third parties for a variety of reasons, including allowing clients to hold investments in separate legal entities, allowing clients to invest jointly in alternative assets, for asset securitization transactions, and for buying or selling credit protection.

When assessing whether to consolidate an entity, the Group evaluates a range of control factors, namely:

- Purpose and design of the entity
- Relevant activities and how these are determined
- Whether the Group's rights result in the ability to direct the relevant activities
- Whether the Group has exposure or rights to variable returns
- Whether the Group has the ability to use its power to affect the amount of its returns

Where voting rights are relevant, the Group is deemed to have control where it holds, directly or indirectly, more than half of the voting rights over an entity unless there is evidence that another investor has the practical ability to unilaterally direct the relevant activities.

Potential voting rights that are deemed to be substantive are also considered when assessing control.

Likewise, the Group also assesses existence of control where it does not control the majority of the voting power but has the practical ability to unilaterally direct the relevant activities. This may arise in circumstances where the size and dispersion of holdings of the shareholders give the Group the power to direct the activities of the investee.

The Group reassesses the consolidation status at least at every quarterly reporting date. Therefore, any changes in the structure leading to a change in one or more of the control factors, require reassessment when they occur. This includes changes in decision making rights, changes in contractual arrangements, changes in the financing, ownership or capital structure as well as changes following a trigger event which was anticipated in the original documentation.

All intercompany transactions, balances and unrealized gains on transactions between Group companies are eliminated on consolidation.

Consistent accounting policies are applied throughout the Group for the purposes of consolidation. Issuances of a subsidiary's stock to third parties are treated as non-controlling interests. Profit or loss attributable to non-controlling interests are reported separately in the Consolidated Statement of Income and Consolidated Statement of Comprehensive Income.

At the date that control of a subsidiary is lost, the Group: a) derecognizes the assets (including attributable goodwill) and liabilities of the subsidiary at their carrying amounts, b) derecognizes the carrying amount of any non-controlling interests in the former subsidiary, c) recognizes the fair value of the consideration received and any distribution of the shares of the subsidiary, d) recognizes any investment retained in the former subsidiary at its fair value and e) recognizes any resulting difference of the above items as a gain or loss in the income statement. Any amounts recognized in prior periods in other comprehensive income in relation to that subsidiary would be reclassified to the Consolidated Statement of Income or transferred directly to retained earnings if required by other IFRSs.

Associates

Investments in associates are accounted for under the equity method of accounting. An associate is an entity in which the Group has significant influence, but not a controlling interest, over the operating and financial management policy decisions of the entity. Significant influence is generally presumed when the Group holds between 20 % and 50 % of the voting rights. The existence and effect of potential voting rights that are currently exercisable or convertible are considered in assessing whether the Group has significant influence. Among the other factors that are considered in determining whether the Group has significant influence are representation on the board of directors (supervisory board in the case of German stock corporations) and material intercompany transactions. The existence of these factors could require the application of the equity method of accounting for a particular investment even though the Group's investment is less than 20 % of the voting stock.

Under the equity method of accounting, the Group's investments in associates and jointly controlled entities are initially recorded at cost including any directly related transaction costs incurred in acquiring the associate, and subsequently increased (or decreased) to reflect both the Group's pro-rata share of the post-acquisition net income (or loss) of the associate or jointly controlled entity and other movements included directly in the equity of the associate or jointly controlled entity. The Group's share of the results of associates is adjusted to conform to the accounting policies of the Group and is reported in the Consolidated Statement of Income as Net income (loss) from equity method investments. The Group's share in the associate's profits and losses resulting from intercompany sales is eliminated on consolidation. Goodwill arising on the acquisition of an associate or a jointly controlled entity is included in the carrying value of the investment. As goodwill is not reported separately it is not specifically tested for impairment. Rather, the entire equity method investment is tested for impairment at each balance sheet date.

If there is objective evidence of impairment, an impairment test is performed by comparing the investment's recoverable amount, which is the higher of its value in use and fair value less costs to sell, with its carrying amount. An impairment loss recognized in prior periods is only reversed if there has been a positive change in the estimates used to determine the

investment's recoverable amount since the last impairment loss was recognized. If this is the case the carrying amount of the investment is increased to its higher recoverable amount. The increased carrying amount of the investment in the associate attributable to a reversal of an impairment loss shall not exceed the carrying amount that would have been determined had no impairment loss been recognized for the investment in prior years.

At the date that the Group ceases to have significant influence over the associate or jointly controlled entity the Group recognizes a gain or loss on the disposal of the equity method investment equal to the difference between the sum of the fair value of any retained investment and the proceeds from disposing of the associate and the carrying amount of the investment. Amounts recognized in prior periods in other comprehensive income in relation to the associate are accounted for on the same basis as would have been required if the investee had directly disposed of the related assets or liabilities.

Critical accounting estimates: The assessment of whether there is objective evidence of impairment may require significant management judgment and the estimates for impairment could change from period to period based on future events that may or may not occur. The Group considers this to be a critical accounting estimate.

Foreign currency translation

The Consolidated Financial Statements are prepared in euro, which is the presentation currency of the Group. Various entities in the Group use a different functional currency, being the currency of the primary economic environment in which the entity operates.

An entity records foreign currency revenues, expenses, gains and losses in its functional currency using the exchange rates prevailing at the dates of recognition.

Monetary assets and liabilities denominated in currencies other than the entity's functional currency are translated at the period end closing rate. Foreign exchange gains and losses resulting from the translation and settlement of these items are recognized in the Consolidated Statement of Income as net gains (losses) on financial assets/liabilities at fair value through profit or loss in order to align the translation amounts with those recognized from foreign currency related transactions (derivatives) which hedge these monetary assets and liabilities.

Non-monetary items that are measured at historical cost are translated using the historical exchange rate at the date of the transaction. Translation differences on non-monetary items which are held at fair value through profit or loss are recognized in profit or loss.

For purposes of translation into the presentation currency, assets and liabilities of foreign operations are translated at the period end closing rate and items of income and expense are translated into euros at the rates prevailing on the dates of the transactions, or average rates of exchange where these approximate actual rates. The exchange differences arising on the translation of a foreign operation are included in other comprehensive income. For foreign operations that are subsidiaries, the amount of exchange differences attributable to any non-controlling interests is recognized in non-controlling interests.

Upon disposal of a foreign subsidiary and associate (which results in loss of control or significant influence over that operation) the total cumulative exchange differences recognized in other comprehensive income are reclassified to profit or loss.

Upon partial disposal of a foreign operation that is a subsidiary and which does not result in loss of control, the proportionate share of cumulative exchange differences is reclassified from other comprehensive income to non-controlling interests as this is deemed a transaction with equity holders. For a partial disposal of an associate which does not result in a loss of significant influence, the proportionate share of cumulative exchange differences is reclassified from other comprehensive income to profit or loss.

Interest, commissions and fees

Net interest income – Interest income and expense from all interest-bearing assets and liabilities is recognized as net interest income using the effective interest rate method. The effective interest rate (EIR) is a method of calculating the amortized cost of a financial asset or a financial liability and of allocating the interest income or expense over the relevant period using the estimated future cash flows.

The estimated future cash flows used in the EIR calculation include those determined by all of the contractual terms of the asset or liability, all fees (including commissions) that are considered to be integral to the effective interest rate, direct and incremental transaction costs and all other premiums or discounts. However, if the financial instrument is carried at fair value through profit or loss, any associated fees are recognized in trading income when the instrument is initially recognized, provided there are no significant unobservable inputs used in determining its fair value.

If a financial asset is credit impaired, interest revenue is calculated by applying the effective interest rate to the amortized cost amount. The amortized cost amount of a financial asset is the gross carrying amount of a financial asset after adjusting for any impairment allowance. For assets which are initially recognized as purchased or credit impaired, interest revenue is calculated through the use of a credit-adjusted effective interest rate which takes into consideration expected credit losses.

The Group presents negative interest paid on interest-bearing assets as interest expense, and interest revenue received from interest-bearing liabilities as interest income.

The Group presents interest income and expense calculated using the EIR method separately in the Group's consolidated statement of income.

Commissions and fee income –The Group applies the IFRS 15, "Revenue from Contracts with Customers" five-step revenue recognition model to the recognition of Commissions and Fee Income, under which income must be recognized when control of goods and services is transferred, hence the contractual performance obligations to the customer has been satisfied.

Accordingly, after a contract with a customer has been identified in the first step, the second step is to identify the performance obligation – or a series of distinct performance obligations – provided to the customer. The Group must examine whether the service is capable of being distinct and is actually distinct within the context of the contract. A promised service is distinct if the customer can benefit from the service either on its own or together with other resources that are readily available to the customer, and the promise to transfer the service to the customer is separately identifiable from other promises in the contract. The amount of income is measured on the basis of the contractually agreed transaction price for the performance obligation defined in the contract. If a contract includes a variable consideration, the Group estimates the amount of consideration to which it will be entitled in exchange for transferring the promised goods or services to a customer. Income is recognized in profit and loss when the identified performance obligation has been satisfied. The Group does not present information about its remaining performance obligations if it is part of a contract that has an original expected duration of one year or less.

The Group determines the stand-alone selling price at contract inception of a distinct service underlying each performance obligation in the contract and allocates the transaction price in proportion to those stand-alone selling prices. The stand-alone selling price is the price at which DB would sell a promised service separately to a customer on an unbundled basis. The best evidence of a stand-alone selling price is the observable price of a service when the Group sells that service separately in similar circumstances and to similar customers. If the Group does not sell the service to a customer separately, it estimates the stand-alone selling price at an amount using a suitable method, for example, in loan syndication transactions the Group applies the requirements for recognition of trade day profit and considers the price at which other market participants provide the same service on an unbundled basis. As such when estimating a stand-alone selling price, the Group considers all information (including market conditions) that is reasonably available to it. In doing so, the Group maximizes the use of observable inputs and applies estimation methods consistently in similar circumstances.

The Group provides asset management services that give rise to asset management and performance fees and constitute a single performance obligation. The asset management and performance fee components are variable considerations such that at each reporting date the Group estimates the fee amount to which it will be entitled in exchange for transferring the promised services to the customer. The benefits arising from the asset management services are simultaneously received and consumed by the customer over time. The Group recognizes revenue over time by measuring the progress towards complete satisfaction of that performance obligation, subject to the removal of any uncertainty as to whether it is highly probable that a significant reversal in the cumulative amount of revenue recognized would occur or not. For the management fee component this is the end of the monthly or quarterly service period. For performance fees this date is when any uncertainty related to the performance component has been fully removed.

Loan commitment fees related to commitments that are accounted for off balance sheet are recognized in commissions and fee income over the life of the commitment if it is unlikely that the Group will enter into a specific lending arrangement. If it is probable that the Group will enter into a specific lending arrangement, the loan commitment fee is deferred until the origination of a loan and recognized as an adjustment to the loan's effective interest rate.

Commissions and Fee Income predominantly earned from services that are received and consumed by the customer over time: Administration, assets under management, foreign commercial business, loan processing and guarantees sundry other customer services. The Group recognizes revenue from these services over time by measuring the progress towards complete satisfaction of that performance obligation, subject to the removal of any uncertainty as to whether it is highly probable that a significant reversal in the cumulative amount of revenue recognized would occur or not.

Commissions and Fee Income predominantly earned from providing services at a point in time or transaction-type services include: other securities, underwriting and advisory fees, brokerage fees, local payments, foreign currency/ exchange business and intermediary fees.

Expenses that are directly related and incremental to the generation of Commissions and Fee Income are presented net in Commissions and Fee Income in the Consolidated Statement of Income. This includes income and associated expense where the Group contractually owns the performance obligation (i.e. as Principal) in relation to the service that gives rise to the revenue and associated expense. In contrast, it does not include situations where the Group does not contractually own the performance obligation and is acting as agent. The determination of whether the Group is acting as principal or agent is based on the contractual terms of the underlying service arrangement. The gross Commissions and Fee Income and Expense amounts are disclosed in "Note 6 – Commissions and Fee Income".

Financial assets

The Group classifies financial assets in line with the classification and measurement requirements of IFRS 9, where financial assets are classified based on both the business model used for managing the financial assets and the contractual cash flow characteristics of the financial asset (known as Solely Payments of Principal and Interest or "SPPI"). There are three business models available:

- Hold to Collect - Financial assets held with the objective to collect contractual cash flows. They are subsequently measured at amortized cost and are recorded in multiple lines on the Group's consolidated balance sheet.
- Hold to Collect and Sell - Financial assets held with the objective of both collecting contractual cash flows and selling financial assets. They are recorded as Financial assets at Fair Value through Other Comprehensive Income on the Group's consolidated balance sheet.
- Other - Financial assets that do not meet the criteria of either "Hold to Collect" or "Hold to Collect and Sell". They are recorded as Financial Assets at Fair Value through Profit or Loss on the Group's consolidated balance sheet.

The assessment of business model requires judgment based on facts and circumstances upon initial recognition. As part of this assessment, the Group considers quantitative factors (e.g., the expected frequency and volume of sales) and qualitative factors such as how the performance of the business model and the financial assets held within that business model are evaluated and reported to the Group's key management personnel. In addition to taking into consideration the risks that affect the performance of the business model and the financial assets held within that business model, in particular, the way in which those market and credit risks are managed; and how managers of the business are compensated (e.g., whether the compensation is based on the fair value of the assets managed or on the contractual cash flows collected). This assessment results in an asset being classified in either a Hold to Collect, Hold to Collect and Sell or Other business model.

If the Group holds a financial asset either in a Hold to Collect or a Hold to Collect and Sell business model, then an assessment at initial recognition to determine whether the contractual cash flows of the financial asset are Solely Payments of Principal and Interest on the principal amount outstanding is required to determine the financial asset classification. Contractual cash flows, that are SPPI on the principal amount outstanding, are consistent with a basic lending arrangement. Interest in a basic lending arrangement is consideration for the time value of money and the credit risk associated with the principal amount outstanding during a particular period of time. It can also include consideration for other basic lending risks (e.g., liquidity risk) and costs (e.g., administrative costs) associated with holding the financial asset for a particular period of time; and a profit margin that is consistent with a basic lending arrangement.

Financial assets at fair value through profit or loss

Financial assets are classified at fair value through profit or loss if they are held in the Other business model because they are either held for trading or because they do not meet the criteria for Hold to Collect or Hold to Collect and Sell. In addition, it includes financial assets that meet the criteria for Hold to Collect or Hold to Collect and Sell business model, but the financial asset fails SPPI or where the Group designated the financial assets under the fair value option.

Financial assets classified as Financial assets at fair value through profit or loss are measured at fair value with realized and unrealized gains and losses included in Net gains (losses) on financial assets/liabilities at fair value through profit or loss. Interest on interest earning assets such as trading loans and debt securities and dividends on equity instruments are presented in Interest and Similar Income.

Financial assets classified at fair value through profit or loss are recognized or derecognized on trade date. Trade date is the date on which the Group commits to purchase or sell the asset.

Trading assets – Financial assets are classified as held for trading if they have been originated, acquired or incurred principally for the purpose of selling or repurchasing them in the near term, or they form part of a portfolio of identified financial instruments that are managed together and for which there is evidence of a recent actual pattern of short-term profit-taking. Trading assets include debt and equity securities, derivatives held for trading purposes, and trading loans. This also includes loan commitments that are allocated to the Other business model and that are presented as derivatives held for trading.

Non-trading financial assets mandatory at fair value through profit and loss – The Group assigns any non-trading financial asset that does not fall into the Hold to Collect nor Hold to Collect and Sell business models into the Other business model and classifies them as Non-Trading Financial Assets mandatory at Fair Value through Profit and Loss. This includes predominately reverse repurchase agreements which are managed on a fair value basis. Additionally, any financial asset that falls into the Hold to Collect or Hold to Collect and Sell business models for which the contractual cash flow characteristics are not SPPI is classified by the Group as Non-Trading Financial Assets Mandatory at Fair Value through Profit and Loss.

Financial assets designated at fair value through profit or loss – Certain financial assets that would otherwise be measured subsequently at amortized cost or at fair value through other comprehensive income, may be designated at Fair Value through Profit or Loss if the designation eliminates or significantly reduces a measurement or recognition inconsistency. The Group allows the fair value option to be designated only for those financial instruments for which a reliable estimate of fair value can be obtained.

Financial assets at fair value through other comprehensive income

A financial asset shall be classified and measured at Fair Value through Other Comprehensive Income ("FVOCI"), if the financial asset is held in a Hold to Collect and Sell business model and the contractual cash flows are SPPI, unless designated under the fair value option.

Under FVOCI, a financial asset is measured at its fair value with any changes being recognized in Other Comprehensive Income ("OCI") and is assessed for impairment under the IFRS 9 expected credit loss model where provisions are recorded through profit or loss (based on expectations of potential credit losses). The Group's impairment policy is described further in the section "Impairment of Loans and Provision for Off-Balance Sheet Positions (IFRS 9)". The foreign currency translation effect for FVOCI assets is recognized in profit or loss, as is the interest component by using the effective interest method. The amortization of premiums and accretion of discounts are recorded in net interest income. Realized gains and losses are reported in net gains (losses) on financial assets at FVOCI. Generally, the weighted-average cost method is used to determine the cost of FVOCI financial assets.

Financial assets classified as FVOCI are recognized or derecognized on trade date. Trade date is the date on which the Group commits to purchase or sell the asset.

It is possible to designate non-trading equity instruments as FVOCI. However, this category is expected to have limited usage by the Group and has not been used to date.

Financial assets at amortized cost

A financial asset is classified and subsequently measured at amortized cost if the financial asset is held in a Hold to Collect business model and the contractual cash flows are SPPI.

Under this measurement category, the financial asset is measured at fair value at initial recognition. Subsequently the carrying amount is reduced for principal payments, plus or minus the cumulative amortization using the effective interest method. The financial asset is assessed for impairment under the IFRS 9 expected credit loss model where provisions are recognized based on expectations of potential credit losses. The Group's impairment of financial instruments policy is described further in the section "Impairment of Loans and Provision for Off-Balance Sheet Positions (IFRS 9)". Financial assets measured at amortized cost are recognized on a settlement date basis.

Financial Assets at amortized cost include predominately Loans at amortized cost, Central bank funds sold and securities purchased under resale agreements, Securities borrowed and certain receivables presented in Other Assets.

Modification of financial assets and financial liabilities

When the terms of a financial asset are renegotiated or modified and the modification does not result in derecognition, a gain or loss is recognized in the income statement as the difference between the original contractual cash flows and the modified cash flows discounted at the original effective interest rate. The modified financial asset will continue to accrued interest at its original EIR. When a modification results in derecognition the original instrument is derecognized and the new instrument recognized at fair value.

Non-credit related or commercial renegotiations where an obligor has not experienced a significant increase in credit risk since origination, and has a readily exercisable right to early terminate the financial asset results in derecognition of the original agreement and recognition of a new financial asset based on the newly negotiated commercial terms.

For credit related modifications (i.e. those modifications due to significant increase in credit risk since inception) or those where the obligor does not have the readily exercisable right to early terminate, the Group assesses whether the modified terms result in the financial asset being significantly modified and therefore derecognized. This assessment includes a quantitative assessment of the impact of the change in cash flows from the modification of contractual terms and additionally, where necessary, a qualitative assessment of the impact of the change in the contractual terms. Where these modifications are not concluded to be significant, the financial asset is not derecognized and is accounted for as a modification as described above.

If the changes are concluded to be significant, the old instrument is derecognized and a new instrument recognized. The Group then recognizes a credit loss allowance based on 12-month expected credit losses. However, if following a modification that results in a derecognition of the original financial asset, there is evidence that the new financial asset is credit-impaired on initial recognition; then the new financial asset should be recognized as an originated credit-impaired financial asset and initially classified in Stage 3 (refer to section "Impairment of Loans and Provision for Off-Balance Sheet Positions" below).

When the terms of a financial liability are renegotiated or modified then the Group assesses whether the modified terms result in the financial liability being significantly modified and therefore derecognized. This assessment includes a quantitative assessment of the impact of the change in cash flows from the modification of contractual terms and additionally, where necessary, a qualitative assessment of the impact of the change in the contractual terms. Where these modifications are not concluded to be significant, the financial liability is not derecognized and a gain or loss is recognized in the income statement as the difference between the original contractual cash flows and the modified cash flows discounted at the original effective interest rate. Where there is derecognition the original financial liability is derecognized and the new liability recognized at its fair value.

Loan commitments

Loan commitments remain off-balance sheet, unless allocated to the Other business model and presented as derivatives held for trading. The Group does not recognize and measure changes in fair value of off-balance sheet loan commitments that result from changes in market interest rates or credit spreads. However, as specified in the sections "Impairment of Loans and Provision for Off-Balance Sheet Positions" below, these off-balance sheet loan commitments are in scope of the IFRS 9 impairment model.

Financial liabilities

Under IFRS 9 financial liabilities are measured at amortized cost using the effective interest method, except for financial liabilities at fair value through profit or loss.

Financial liabilities at fair value through profit or loss

Financial liabilities at fair value through profit or loss include Trading Liabilities, Financial Liabilities Designated at Fair Value through Profit or Loss and Non-Participating Investment Contracts ("Investment Contracts"). Under IFRS 9 they are carried at fair value with realized and unrealized gains and losses included in net gains (losses) on financial assets and liabilities at fair value through profit or loss. For financial liabilities designated at fair value through profit and loss the fair value movements attributable to the Group's own credit component for fair value movements is recognized in Other Comprehensive Income.

Financial liabilities classified at fair value through profit or loss are recognized or derecognized on trade date. Trade date is the date on which the Group commits to issue or repurchase the financial liability.

Interest on interest paying liabilities are presented in interest expense for financial instruments at fair value through profit or loss.

Trading liabilities - Financial liabilities that arise from debt issued are classified as held for trading if they have been originated or incurred principally for the purpose of repurchasing them in the near term. Trading liabilities consist primarily of derivative liabilities (including certain loan commitments) and short positions. This also includes loan commitments where the resulting loan upon funding is allocated to the other business model such that the undrawn loan commitment is classified as derivatives held for trading.

Financial liabilities designated at fair value through profit or loss - Certain financial liabilities that do not meet the definition of trading liabilities are designated at fair value through profit or loss using the fair value option. To be designated at fair value through profit or loss, financial liabilities must meet one of the following criteria: (1) the designation eliminates or significantly reduces a measurement or recognition inconsistency; (2) a group of financial liabilities is managed and its performance is evaluated on a fair value basis in accordance with a documented risk management or investment strategy; or (3) the instrument contains one or more embedded derivatives unless: (a) the embedded derivative does not significantly modify the cash flows that otherwise would be required by the contract; or (b) it is clear with little or no analysis that separation is prohibited. In addition, the Group allows the fair value option to be designated only for those financial instruments for which a reliable estimate of fair value can be obtained. Financial liabilities which are designated at fair value through profit or loss, under the fair value option, include repurchase agreements, loan commitments and structured note liabilities.

Investment contracts - All of the Group's investment contracts are unit-linked contracts that match specific assets held by the Group. The contracts oblige the Group to use these assets to settle investment contract liabilities. They do not contain significant insurance risk or discretionary participation features. The contract liabilities are determined using current unit prices multiplied by the number of units attributed to the contract holders as of the balance sheet date. As this amount represents fair value, the liabilities have been classified as financial liabilities at fair value through profit or loss. Deposits collected under investment contracts are accounted for as an adjustment to the investment contract liabilities. Investment income attributable to investment contracts is included in the consolidated statement of Income. Investment contract claims reflect the excess of amounts paid over the account balance released. Investment contract policyholders are charged fees for policy administration, investment management, surrenders or other contract services.

Embedded derivatives

Some hybrid financial liability contracts contain both a derivative and a non-derivative component. In such cases, the derivative component is termed an embedded derivative, with the non-derivative component representing the host financial liability contract. If the economic characteristics and risks of embedded derivatives are not closely related to those of the host financial liability contract and the hybrid financial liability contract itself is not carried at fair value through profit or loss, the embedded derivative is bifurcated and reported at fair value, with gains and losses recognized in net gains (losses) on financial assets/liabilities at fair value through profit or loss. The host financial liability contract will continue to be accounted for in accordance with the appropriate accounting standard. The carrying amount of an embedded derivative is reported in the same Consolidated balance sheet line item as the host financial liability contract. Certain hybrid financial liability instruments have been designated at fair value through profit or loss using the fair value option.

Financial liabilities at amortized cost

Financial liabilities measured at amortized cost include long-term and short-term debt issued which are initially measured at fair value, which is the consideration received, net of transaction costs incurred. Repurchases of issued debt in the market are treated as extinguishments and any related gain or loss is recorded in the Consolidated Statement of Income. A subsequent sale of own bonds in the market is treated as a reissuance of debt. Financial liabilities measured at amortized cost are recognized on a settlement date basis.

Offsetting of financial instruments

Financial assets and liabilities are offset, with the net amount presented in the Consolidated balance sheet, only if the Group holds a currently enforceable legal right to set off the recognized amounts and there is an intention to settle on a net basis or to realize an asset and settle the liability simultaneously. The legal right to set off the recognized amounts must be enforceable in both the normal course of business and in the event of default, insolvency or bankruptcy of both the Group and its counterparty. In all other situations they are presented gross. When financial assets and financial liabilities are offset in the Consolidated balance sheet, the associated income and expense items will also be offset in the Consolidated Statement of Income, unless specifically prohibited by an applicable accounting standard.

The majority of the offsetting applied by the Group relates to derivatives and repurchase and reverse repurchase agreements. A significant portion of offsetting is applied to interest rate derivatives and related cash margin balances, which are cleared through central clearing parties. For further information please refer to Note 17 "Offsetting Financial Assets and Financial Liabilities".

Determination of fair value

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an arm's length transaction between market participants at the measurement date. The fair value of instruments that are quoted in active markets is determined using the quoted prices where they represent those at which regularly and recently occurring transactions take place.

The Group measures certain portfolios of financial assets and financial liabilities on the basis of their net risk exposures when the following criteria are met:

- The group of financial assets and liabilities is managed on the basis of its net exposure to a particular market risk (or risks) or to the credit risk of a particular counterparty, in accordance with a documented risk management strategy,
- The fair values are provided to key management personnel, and
- The financial assets and liabilities are measured at fair value through profit or loss.

This portfolio valuation approach is consistent with how the Group manages its net exposures to market and counterparty credit risks.

Critical accounting estimates – The Group uses valuation techniques to establish the fair value of instruments where prices quoted in active markets are not available. Therefore, where possible, parameter inputs to the valuation techniques are based on observable data derived from prices of relevant instruments traded in an active market. These valuation techniques involve some level of management estimation and judgment, the degree of which will depend on the price transparency for the instrument or market and the instrument's complexity.

In reaching estimates of fair value management judgment needs to be exercised. The areas requiring significant management judgment are identified, documented and reported to senior management as part of the valuation control process and the standard monthly reporting cycle. The specialist model validation and valuation control groups focus attention on the areas of subjectivity and judgment.

The level of management judgment required in establishing fair value of financial instruments for which there is a quoted price in an active market is usually minimal. Similarly there is little subjectivity or judgment required for instruments valued using valuation models which are standard across the industry and where all parameter inputs are quoted in active markets.

The level of subjectivity and degree of management judgment required is more significant for those instruments valued using specialized and sophisticated models and where some or all of the parameter inputs are less liquid or less observable. Management judgment is required in the selection and application of appropriate parameters, assumptions and modelling techniques. In particular, where data are obtained from infrequent market transactions then extrapolation and interpolation techniques must be applied. Where no market data are available for a particular instrument then pricing inputs are determined by assessing other relevant sources of information such as historical data, fundamental analysis of the economics of the transaction and proxy information from similar transactions, and making appropriate adjustment to reflect the actual instrument being valued and current market conditions. Where different valuation techniques indicate a range of possible fair values for an instrument then management has to decide what point within the range of estimates appropriately represents the fair value. Further, some valuation adjustments may require the exercise of management judgment to achieve fair value.

Financial assets and liabilities carried at fair value are required to be disclosed according to the inputs to the valuation method that are used to determine their fair value. Specifically, segmentation is required between those valued using quoted market prices in an active market (level 1), valuation techniques based on observable parameters (level 2) and valuation techniques using significant unobservable parameters (level 3). Management judgment is required in determining the category to which certain instruments should be allocated. This specifically arises when the valuation is determined by a number of parameters, some of which are observable and others are not. Further, the classification of an instrument can change over time to reflect changes in market liquidity and therefore price transparency.

The Group provides a sensitivity analysis of the impact upon the level 3 financial instruments of using a reasonably possible alternative for the unobservable parameter. The determination of reasonably possible alternatives requires significant management judgment.

For financial instruments measured at amortized cost (which include loans, deposits and short and long term debt issued) the Group discloses the fair value. Generally there is limited or no trading activity in these instruments and therefore the fair value determination requires significant management judgment.

For further discussion of the valuation methods and controls and quantitative disclosures with respect to the determination of fair value, please refer to Note 13 "Financial Instruments carried at Fair Value" and Note 14 "Fair Value of Financial Instruments not carried at Fair Value".

Recognition of trade date profit

Trade date profit is recognized if the fair value of the financial instrument measured at fair value through profit or loss is obtained from a quoted market price in an active market, or otherwise evidenced by comparison to other observable current market transactions or based on a valuation technique incorporating observable market data. If there are significant unobservable inputs used in the valuation technique, the financial instrument is recognized at the transaction price and any profit implied from the valuation technique at trade date is deferred.

Using systematic methods, the deferred amount is recognized over the period between trade date and the date when the market is expected to become observable, or over the life of the trade (whichever is shorter). Such methodology is used because it reflects the changing economic and risk profile of the instrument as the market develops or as the instrument itself progresses to maturity. Any remaining trade date deferred profit is recognized in the Consolidated Statement of Income when the transaction becomes observable. In the rare circumstances that a trade date loss arises, it would be recognized at inception of the transaction to the extent that it is probable that a loss has been incurred and a reliable estimate of the loss amount can be made.

Critical Accounting Estimates – Management judgment is required in determining whether there exist significant unobservable inputs in the valuation technique of the underlying financial instrument (refer to section “Determination of Fair Value” for management judgment required in establishing fair value of financial instruments). Once deferred, the decision to subsequently recognize the trade date profit requires a careful assessment of the then current facts and circumstances supporting observability of parameters and/or risk mitigation.

Derivatives and hedge accounting

Derivatives are used to manage exposures to interest rate, foreign currency, credit and other market price risks, including exposures arising from forecast transactions. All freestanding contracts that are considered derivatives for accounting purposes are carried at fair value on the Consolidated balance sheet regardless of whether they are held for trading or non-trading purposes.

The changes in fair value on derivatives held for trading are included in net gains (losses) on financial assets/liabilities at fair value through profit or loss.

Hedge accounting

IFRS 9 includes an accounting policy choice to defer the adoption of IFRS 9 hedge accounting and to continue with IAS 39 hedge accounting. The Group decided to exercise this accounting policy choice and did not adopt IFRS 9 hedge accounting as of January 1, 2018.

For accounting purposes there are three possible types of hedges: (1) hedges of changes in the fair value of assets, liabilities or unrecognized firm commitments (fair value hedges); (2) hedges of the variability of future cash flows from highly probable forecast transactions and floating rate assets and liabilities (cash flow hedges); and (3) hedges of the translation adjustments resulting from translating the functional currency financial statements of foreign operations into the presentation currency of the parent (hedges of net investments in foreign operations).

When hedge accounting is applied, the Group designates and documents the relationship between the hedging instrument and the hedged item as well as its risk management objective and strategy for undertaking the hedging transactions and the nature of the risk being hedged. This documentation includes a description of how the Group will assess the hedging instrument's effectiveness in offsetting the exposure to changes in the hedged item's fair value or cash flows attributable to the hedged risk. Hedge effectiveness is assessed at inception and throughout the term of each hedging relationship. Hedge effectiveness is always assessed, even when the terms of the derivative and hedged item are matched.

For hedges of changes in fair value, the changes in the fair value of the hedged asset, liability or unrecognized firm commitment, or a portion thereof, attributable to the risk being hedged, are recognized in the Consolidated Statement of Income along with changes in the entire fair value of the derivative. When hedging interest rate risk, any interest accrued or paid on both the derivative and the hedged item is reported in interest income or expense and the unrealized gains and losses from the hedge accounting fair value adjustments are reported in other revenue. Hedge ineffectiveness is reported in other revenue and is measured as the net effect of changes in the fair value of the hedging instrument and changes in the fair value of the hedged item arising from changes in the market rate or price related to the risk(s) being hedged.

If a fair value hedge of a debt instrument is discontinued prior to the instrument's maturity because the derivative is terminated or the relationship is de-designated, any remaining interest rate-related fair value adjustments made to the carrying amount of the debt instrument (basis adjustments) are amortized to interest income or expense over the remaining term of the original hedging relationship. For other types of fair value adjustments and whenever a fair value hedged asset or liability is sold or otherwise derecognized, any basis adjustments are included in the calculation of the gain or loss on derecognition.

For hedges of variability in future cash flows, there is no change to the accounting for the hedged item and the derivative is carried at fair value, with changes in value reported initially in other comprehensive income to the extent the hedge is effective. These amounts initially recorded in other comprehensive income are subsequently reclassified into the Consolidated Statement of Income in the same periods during which the forecast transaction affects the Consolidated Statement of Income. Thus, for hedges of interest rate risk, the amounts are amortized into interest income or expense at the same time as the interest is accrued on the hedged transaction.

Hedge ineffectiveness is recorded in other income and is measured as changes in the excess (if any) in the absolute cumulative change in fair value of the actual hedging derivative over the absolute cumulative change in the fair value of the hypothetically perfect hedge.

When hedges of variability in cash flows attributable to interest rate risk are discontinued, amounts remaining in accumulated other comprehensive income are amortized to interest income or expense over the remaining life of the original hedge relationship, unless the hedged transaction is no longer expected to occur in which case the amount will be reclassified into other income immediately. When hedges of variability in cash flows attributable to other risks are discontinued, the related amounts in accumulated other comprehensive income are reclassified into either the same Consolidated Statement of Income caption and period as profit or loss from the forecast transaction, or into other income when the forecast transaction is no longer expected to occur.

For hedges of the translation adjustments resulting from translating the functional currency financial statements of foreign operations (hedges of net investments in foreign operations) into the functional currency of the parent, the portion of the change in fair value of the derivative due to changes in the spot foreign exchange rates is recorded as a foreign currency translation adjustment in other comprehensive income to the extent the hedge is effective; the remainder is recorded as other income in the Consolidated Statement of Income.

Changes in fair value of the hedging instrument relating to the effective portion of the hedge are subsequently recognized in profit or loss on disposal of the foreign operations.

Hedging derivatives are reported as other assets and other liabilities. In the event that a derivative is subsequently de-designated from a hedging relationship, it is transferred to financial assets/liabilities at fair value through profit or loss.

Impairment of loans and provision for off-balance sheet positions

The impairment requirements of IFRS 9 apply to all credit exposures that are measured at amortized cost or FVOCI, and to off balance sheet lending commitments such as loan commitments and financial guarantees. For purposes of the impairment policy below, these instruments are referred to as ("Financial Assets")

The determination of impairment losses under IFRS 9 uses an expected credit loss ("ECL") model, where allowances are taken upon initial recognition of the Financial Asset, based on expectations of potential credit losses at the time of initial recognition.

Staged approach to the determination of expected credit losses

IFRS 9 states a three stage approach to impairment for Financial Assets that are not credit impaired at the date of origination or purchase. This approach is summarized as follows:

- Stage 1: The Group recognizes a credit loss allowance at an amount equal to 12-month expected credit losses for all Financial Assets. This represents the portion of lifetime expected credit losses from default events that are expected within 12 months of the reporting date, assuming that credit risk has not increased significantly after initial recognition.
- Stage 2: The Group recognizes a credit loss allowance at an amount equal to lifetime expected credit losses for those Financial Assets which are considered to have experienced a significant increase in credit risk since initial recognition. This requires the determination of the ECL based on lifetime probability of default, lifetime loss given default and lifetime exposure at default that represents the probability of default occurring over the remaining lifetime of the Financial Asset. Allowance for credit losses are higher in this stage because of an increase in credit risk since origination or purchase and the impact of a longer time horizon being considered compared to 12 months in Stage 1.

- Stage 3: The Group recognizes a loss allowance at an amount equal to lifetime expected credit losses, reflecting a Probability of Default of 100 %, via the expected recoverable cash flows for the asset, for those Financial Assets that are credit-impaired. The Group's definition of default is aligned with the regulatory definition of default. Financial Assets that are credit-impaired upon initial recognition are categorized within Stage 3 with a carrying value already reflecting the lifetime expected credit losses. The accounting treatment for these purchased or originated credit-impaired ("POCI") assets is discussed further below.

Significant increase in credit risk

When determining whether the credit risk (i.e., risk of default) of a Financial Asset has increased significantly since initial recognition, the Group considers reasonable and supportable information that is relevant and available without undue cost or effort. This includes quantitative and qualitative information based on the Group's historical experience, credit risk assessment and forward-looking information (including macro-economic factors). The assessment of significant credit deterioration is key in determining when to move from measuring an allowance based on 12-month ECLs to one that is based on lifetime ECLs (i.e., transfer from Stage 1 to Stage 2).

The Group's framework for determining if there has been a significant increase in credit risk aligns with the internal Credit Risk Management ("CRM") process and utilizes:

- Rating related indicators – based on a model that compares lifetime PDs at the reporting date with the lifetime PD expectations at the date of initial recognition and subsequently applies a quantile approach to determine a threshold to define the trigger point for a financial asset's transition into Stage 2; and
- Process related indicators – which uses existing risk management indicators, that in Management's view represent situations where the credit risk of financial assets has significantly increased. These include obligors being added to a credit watchlist, being mandatorily transferred to workout status, payments being 30 days or more past due or in forbearance.

These indicators are discussed further in section "IFRS 9 Impairment Approach" in the Risk Report.

Credit impaired financial assets in Stage 3

The Group has aligned its definition of credit impaired under IFRS 9 to when a Financial Asset has defaulted for regulatory purposes, according to the Capital Requirements Regulation under Art. 178.

The determination of whether a Financial Asset is credit impaired and therefore in Stage 3 focusses exclusively on default risk, without taking into consideration the effects of credit risk mitigants such as collateral or guarantees. Specifically, a Financial Asset is credit impaired and in Stage 3 when:

- The Group considers the obligor is unlikely to pay its credit obligations to the Group. Determination may include forbearance actions, where a concession has been granted to the borrower or economic or legal reasons that are qualitative indicators of credit impairment; or
- Contractual payments of either principal or interest by the obligor are past due by more than 90 days.

For Financial Assets considered to be credit impaired, the ECL allowance covers the amount of loss the Group is expected to suffer. The estimation of ECLs is undertaken on a case-by-case basis for non-homogeneous portfolios, or by applying portfolio based parameters to individual Financial Assets in these portfolios via the Group's ECL model for homogeneous portfolios. This estimate includes the use of discounted cash flows that are adjusted for scenarios.

Forecasts of future economic conditions when calculating ECLs are considered. The lifetime expected losses are estimated based on the probability-weighted present value of the difference between the contractual cash flows that are due to the Group under the contract; and the cash flows that the Group expects to receive.

A Financial Asset can be classified as credit impaired in Stage 3 but without an allowance for credit losses (i.e., no impairment loss is expected). This may be due to the value of collateral. The Group's engine based ECL calculation is conducted on a monthly basis, whereas the case-by-case assessment of ECL in Stage 3 for non-homogeneous portfolio has to be performed at least on a quarterly basis.

Purchased or originated credit impaired financial assets in Stage 3

A Financial Asset is considered purchased or originated credit-impaired if there is objective evidence of impairment at the time of initial recognition. Such credit impaired Financial Assets are termed POCI Financial Assets. POCI Financial Assets are measured to reflect lifetime expected credit losses, and all subsequent changes in lifetime expected credit losses, whether positive or negative, are recognized in the income statement as a component of the provision for credit losses. POCI Financial Assets can only be classified in Stage 3 over the life of the Financial Asset.

Write-offs

The Group reduces the gross carrying amount of a Financial Asset when there is no reasonable expectation of recovery. Write-offs can relate to a Financial Asset in its entirety, or to a portion of it, and constitute a derecognition event. The Group considers all relevant information in making this determination, including but not limited to:

- Foreclosure actions taken by the Group which have not been successful or have a high probability of not being successful
- Collateral liquidation which has not, or will not lead to further considerable recoveries
- Situations where no further recoveries are reasonably expected

Write-offs can take place before legal actions against the borrower to recover the debt have been concluded, and a write-off does not involve the Group forfeiting its legal right to recover the debt.

Interest Rate used in the IFRS 9 model

In the context of the ECL calculation, the Group applies in line with IFRS 9 an approximation of the EIR, which is usually the contractual interest rate ("CIR") and which does not materially differ from the EIR. The CIR is deemed to be an appropriate approximation, as the interest rate is consistently used in the ECL model, interest recognition and for discounting of the ECL.

Collateral for financial assets considered in the impairment analysis

IFRS 9 requires cash flows expected from collateral and other credit enhancement to be reflected in the ECL calculation. The following are key aspects with respect to collateral and guarantees:

- Eligibility of collateral, i.e. which collateral should be considered in the ECL calculation;
- Collateral evaluation, i.e. what collateral (liquidation) value should be used; and
- Projection of the available collateral amount over the life of a transaction.

These concepts are outlined in more detail in section "IFRS 9 Impairment Approach" in the Risk Report.

Critical accounting estimates – The accounting estimates and judgments related to the impairment of Financial Assets is a critical accounting estimate because the underlying assumptions used can change from period to period and may significantly affect the Group's results of operations.

In assessing assets for impairments, management judgment is required, particularly in projecting forward looking information and scenarios in particular in circumstances of economic and financial uncertainty, when developments and changes to expected cash flows can occur both with greater rapidity and less predictability. The actual amount of the future cash flows and their timing may differ from the estimates used by management and consequently may cause actual losses to differ from reported allowances.

For those non-homogeneous loans in Stage 3 the determination of the impairment allowance often requires the use of considerable judgment concerning such matters as local economic conditions, the financial performance of the counterparty and the value of any collateral held, for which there may not be a readily accessible market.

The determination of the expected credit losses in Stages 1 and 2 and for homogeneous loans in Stage 3 is calculated using the Group's ECL model. The model incorporates numerous estimates and judgments. The Group performs a regular review of the model and underlying data and assumptions. The probability of defaults, loss recovery rates and judgments concerning ability of borrowers in foreign countries to transfer the foreign currency necessary to comply with debt repayments, amongst other things, are incorporated into this review. Management judgement over the following critical accounting estimates has increased since early 2020 as a result of the COVID-19 pandemic and the war in Ukraine:

- **Forward-Looking Information:** Forward-Looking Information is incorporated into the measurement of the Group Allowance for Credit Losses in terms of adjustments to multi-year PD curves based on macro-economic forecasts. The identification of key macro-economic variables (MEVs) reflects a balance of quantitative and qualitative judgements. Statistical analysis, including for example, back-testing and model sensitivities, are performed to assess the explanatory power of MEVs, while expert input from credit officers ensures management comfort in the overall model behavior. The final model parameterization is based on a review and challenge of impacts in internal governance forums and an independent validation performed by the Model Risk Management function. Furthermore, conceptual soundness of the estimation approach is ensured by model testing analysis prepared as part of model changes and an ongoing monitoring framework in order for the ECL provision to reflect management's best estimate in the calculation of expected credit losses.
- **Significant Increase in Credit Risk:** In line with the section "IFRS 9 Impairment Approach" in the Risk Report, the Group uses rating-related indicators to determine whether a financial asset's credit risk has significantly increased since inception. For financial assets in non-homogeneous portfolios the ratings are determined for every counterparty individually based on credit officer's expert judgement. For financial assets in the homogeneous portfolios (due to the large number of client relationships) the rating process is significantly automated with less judgement required by credit officers on individual counterparties. For both homogeneous and non-homogeneous portfolios the rating-related indicators to determine whether the credit risk for a financial asset has significantly increased are based on a model that compares lifetime PDs at the reporting date with the lifetime PD expectations at the date of initial recognition and subsequently applying a quantile approach to determine a threshold which defines the trigger point for a financial asset's transition into Stage 2. The determination of the quantile to define Stage 2 thresholds are determined by subject matter experts in the Group's Risk function. This represents one of the key critical judgments in the Group's IFRS 9 framework and is validated on an annual basis based on detailed stage-mover analyses, benchmarking with historical behaviors and peer comparisons.
- **Stage 3 LGD Setting for Homogeneous Portfolios:** The allowance for credit losses in Stage 3 is determined for the Group's homogeneous portfolios by an automated process based on partially time dependent LGDs reflecting the lower recovery expectation the longer the client is in default, thereby differentiating between secured and unsecured exposures. The LGDs are calibrated using the Group's loss history built up over preceding decades, experienced market prices of non-performing portfolios sold and expert judgement. In the case of less material portfolios, the empirical calibration of the LGD is partially supported by expert credit officer judgements, especially for determining the client cure rates as one of the key inputs. The LGD settings are validated on an annual basis and are regularly reviewed by the Group's independent model validation process which is part of the Model Risk Management function.

The quantitative disclosures are provided in Note 18 "Loans" and Note 19 "Allowance for credit losses" as well as the Risk Report, section "IFRS 9 Impairment", sub-section "Model Sensitivity".

Derecognition of financial assets and liabilities

Financial asset derecognition

A financial asset is considered for derecognition when the contractual rights to the cash flows from the financial asset expire, or the Group has either transferred the contractual right to receive the cash flows from that asset, or has assumed an obligation to pay those cash flows to one or more recipients, subject to certain criteria.

The Group derecognizes a transferred financial asset if it transfers substantially all the risks and rewards of ownership.

The Group enters into transactions in which it transfers previously recognized financial assets but retains substantially all the associated risks and rewards of those assets; for example, a sale to a third party in which the Group enters into a concurrent total return swap with the same counterparty. These types of transactions are accounted for as secured financing transactions.

In transactions in which substantially all the risks and rewards of ownership of a financial asset are neither retained nor transferred, the Group derecognizes the transferred asset if control over that asset is not retained, i.e., if the transferee has the practical ability to sell the transferred asset. The rights and obligations retained in the transfer are recognized separately as assets and liabilities, as appropriate. If control over the asset is retained, the Group continues to recognize the asset to the extent of its continuing involvement, which is determined by the extent to which it remains exposed to changes in the value of the transferred asset.

The derecognition criteria are also applied to the transfer of part of an asset, rather than the asset as a whole, or to a group of similar financial assets in their entirety, when applicable. If transferring a part of an asset, such part must be a specifically identified cash flow, a fully proportionate share of the asset, or a fully proportionate share of a specifically-identified cash flow.

If an existing financial asset is replaced by another asset from the same counterparty on substantially different terms, or if the terms of the financial asset are substantially modified (due to forbearance measures or otherwise), the existing financial asset is derecognized and a new asset is recognized. Any difference between the respective carrying amounts is recognized in the Consolidated Statement of Income.

Securitization

The Group securitizes various consumer and commercial financial assets, which is achieved via the transfer of these assets to a structured entity, which issues securities to investors to finance the acquisition of the assets. Financial assets awaiting securitization are classified and measured as appropriate under the policies in the “Financial Assets and Liabilities” section. If the structured entity is not consolidated then the transferred assets may qualify for derecognition in full or in part, under the policy on derecognition of financial assets. Synthetic securitization structures typically involve derivative financial instruments for which the policies in the “Derivatives and Hedge Accounting” section would apply. Those transfers that do not qualify for derecognition may be reported as secured financing or result in the recognition of continuing involvement liabilities. The investors and the securitization vehicles generally have no recourse to the Group’s other assets in cases where the issuers of the financial assets fail to perform under the original terms of those assets.

Interests in the securitized financial assets may be retained in the form of senior or subordinated tranches, interest only strips or other residual interests (collectively referred to as “retained interests”). Provided the Group’s retained interests do not result in consolidation of a structured entity, nor in continued recognition of the transferred assets, these interests are typically recorded in financial assets at fair value through profit or loss and carried at fair value. Consistent with the valuation of similar financial instruments, the fair value of retained tranches or the financial assets is initially and subsequently determined using market price quotations where available or internal pricing models that utilize variables such as yield curves, prepayment speeds, default rates, loss severity, interest rate volatilities and spreads. The assumptions used for pricing are based on observable transactions in similar securities and are verified by external pricing sources, where available. Where observable transactions in similar securities and other external pricing sources are not available, management judgment must be used to determine fair value. The Group may also periodically hold interests in securitized financial assets and record them at amortized cost.

In situations where the Group has a present obligation (either legal or constructive) to provide financial support to an unconsolidated securitization entity a provision will be created if the obligation can be reliably measured and it is probable that there will be an outflow of economic resources required to settle it.

When an asset is derecognized a gain or loss equal to the difference between the consideration received and the carrying amount of the transferred asset is recorded. When a part of an asset is derecognized, gains or losses on securitization depend in part on the carrying amount of the transferred financial assets, allocated between the financial assets derecognized and the retained interests based on their relative fair values at the date of the transfer.

Derecognition of financial liabilities

A financial liability is derecognized when the obligation under the liability is discharged or cancelled or expires. If an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of the existing liability are substantially modified, such an exchange or modification is treated as a derecognition of the original liability and the recognition of a new liability, and the difference in the respective carrying amounts is recognized in the Consolidated Statement of Income.

Repurchase and reverse repurchase agreements

Securities purchased under resale agreements (“reverse repurchase agreements”) and securities sold under agreements to repurchase (“repurchase agreements”) are treated as collateralized financings and are recognized initially at fair value, being the amount of cash disbursed and received, respectively. The party disbursing the cash takes possession of the securities serving as collateral for the financing and having a market value equal to, or in excess of, the principal amount loaned. The securities received under reverse repurchase agreements and securities delivered under repurchase agreements are not recognized on, or derecognized from, the balance sheet, because the risks and rewards of ownership are not obtained nor relinquished. Securities delivered under repurchase agreements which are not derecognized from the balance sheet and where the counterparty has the right by contract or custom to sell or repledge the collateral are disclosed in Note 20 “Transfer of Financial Assets, Assets Pledged and Received as Collateral”.

The Group allocates reverse repurchase portfolios that are managed on a fair value basis to the other business model under IFRS 9 and classifies them as “Non-trading financial assets mandatory at fair value through profit or loss”.

Interest earned on reverse repurchase agreements and interest incurred on repurchase agreements is reported as interest income and interest expense, respectively.

Securities borrowed and securities loaned

Securities borrowed transactions generally require the Group to deposit cash with the securities lender. In a securities loaned transaction, the Group generally receives either cash collateral, in an amount equal to or in excess of the market value of securities loaned, or securities. The Group monitors the fair value of securities borrowed and securities loaned and additional collateral is disbursed or obtained, if necessary.

The securities borrowed are not themselves recognized in the financial statements. If they are sold to third parties, the obligation to return the securities is recorded as a financial liability at fair value through profit or loss and any subsequent gain or loss is included in the Consolidated Statement of Income in net gains (losses) on financial assets/liabilities at fair value through profit or loss. Securities lent to counterparties are also retained on the Consolidated balance sheet.

The Group records the amount of cash advanced or received as securities borrowed and securities loaned, respectively, in the Consolidated balance sheet.

Fees received or paid are reported in interest income and interest expense, respectively. Securities lent to counterparties which are not derecognized from the Consolidated balance sheet and where the counterparty has the right by contract or custom to sell or repledge the collateral are disclosed in Note 20 "Transfer of Financial Assets, Assets Pledged and Received as Collateral".

Goodwill and other intangible assets

Goodwill arises on the acquisition of subsidiaries and associates and represents the excess of the aggregate of the cost of an acquisition and any non-controlling interests in the acquiree over the fair value of the identifiable net assets acquired at the date of the acquisition.

For the purpose of calculating goodwill, fair values of acquired assets, liabilities and contingent liabilities are determined by reference to market values or by discounting expected future cash flows to present value. This discounting is either performed using market rates or by using risk-free rates and risk-adjusted expected future cash flows. Any non-controlling interests in the acquiree are measured either at fair value or at the non-controlling interests' proportionate share of the acquiree's identifiable net assets (this is determined for each business combination).

Goodwill on the acquisition of subsidiaries is capitalized and reviewed for impairment annually or more frequently if there are indications that impairment may have occurred. For the purposes of impairment testing, goodwill acquired in a business combination is allocated to cash-generating units ("CGUs"), which are the smallest identifiable groups of assets that generate cash inflows largely independent of the cash inflows from other assets or groups of assets and that are expected to benefit from the synergies of the combination and considering the business level at which goodwill is monitored for internal management purposes. In identifying whether cash inflows from an asset (or a group of assets) are largely independent of the cash inflows from other assets (or groups of assets) various factors are considered, including how management monitors the entity's operations or makes decisions about continuing or disposing of the entity's assets and operations.

If goodwill has been allocated to a CGU and an operation within that unit is disposed of, the attributable goodwill is included in the carrying amount of the operation when determining the gain or loss on its disposal.

Corporate assets are allocated to a CGU when the allocation can be done on a reasonable and consistent basis. If this is not possible, the individual CGU is tested without the corporate assets. They are then tested on the level of the minimum collection of CGUs to which they can be allocated on a reasonable and consistent basis.

Intangible assets are recognized separately from goodwill when they are separable or arise from contractual or other legal rights and their fair value can be measured reliably. Intangible assets that have a finite useful life are stated at cost less any accumulated amortization and accumulated impairment losses. Customer-related intangible assets that have a finite useful life are amortized over periods of between 1 and 20 years on a straight-line basis based on their expected useful life. These assets are tested for impairment and their useful lives reaffirmed at least annually.

Certain intangible assets have an indefinite useful life and hence are not amortized but are tested for impairment at least annually or more frequently if events or changes in circumstances indicate that impairment may have occurred.

Costs related to software developed or obtained for internal use are capitalized if it is probable that future economic benefits will flow to the Group and the cost can be measured reliably. Capitalized costs are amortized using the straight-line method over the asset's useful life which is deemed to be either three, five or ten years. Eligible costs include external direct costs for materials and services, as well as payroll and payroll-related costs for employees directly associated with an internal-use software project. Overhead costs, as well as costs incurred during the research phase or after software is ready for use, are expensed as incurred. Capitalized software costs are tested for impairment either annually if still under development or any time when there is an indication of impairment once the software is in use.

Critical accounting estimates – The determination of the recoverable amount in the impairment assessment of non-financial assets requires estimates based on quoted market prices, prices of comparable businesses, present value or other valuation techniques (such as the cost approach), or a combination thereof, necessitating management to make subjective judgments and assumptions. Because these estimates and assumptions could result in significant differences to the amounts reported if underlying circumstances were to change, the Group considers these estimates to be critical.

The quantitative disclosures are provided in Note 23 "Goodwill and other intangible assets".

Provisions

Provisions are recognized if the Group has a present legal or constructive obligation as a result of past events, if it is probable that an outflow of resources will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation.

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation as of the balance sheet date, taking into account the risks and uncertainties surrounding the obligation.

If the effect of the time value of money is material, provisions are discounted and measured at the present value of the expenditure expected to be required to settle the obligation, using a pre-tax rate that reflects the current market assessments of the time value of money and the risks specific to the obligation. The increase in the provision due to the passage of time is recognized as interest expense.

When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party (for example, because the obligation is covered by an insurance policy), an asset is recognized if it is virtually certain that reimbursement will be received.

If the Group has a contract that is onerous, the present obligation under the contract is recognized and measured as a provision. An onerous contract is a contract in which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it.

Critical accounting estimates – The use of estimates is important in determining provisions for potential losses that may arise from litigation and regulatory proceedings. The Group estimates and provides for potential losses that may arise out of litigation and regulatory proceedings to the extent that such losses are probable and can be estimated, in accordance with IAS 37, "Provisions, Contingent Liabilities and Contingent Assets". Significant judgment is required in making these estimates and the Group's final liabilities may ultimately be materially different.

Contingencies in respect of legal matters are subject to many uncertainties and the outcome of individual matters is not predictable with assurance. Significant judgment is required in assessing probability and making estimates in respect of contingencies, and the Group's final liability may ultimately be materially different. The Group's total liability in respect of litigation, arbitration and regulatory proceedings is determined on a case-by-case basis and represents an estimate of probable losses after considering, among other factors, the progress of each case, the Group's experience and the experience of others in similar cases, and the opinions and views of legal counsel. Predicting the outcome of the Group's litigation matters is inherently difficult, particularly in cases in which claimants seek substantial or indeterminate damages. See Note 27 "Provisions" for further information on the uncertainties from the Group's judicial, regulatory and arbitration proceedings.

Income taxes

The Group recognizes the current and deferred tax consequences of transactions that have been included in the consolidated financial statements using the provisions of the respective jurisdictions' tax laws. Current and deferred taxes are recognized in profit or loss except to the extent that the tax relates to items that are recognized directly in equity or other comprehensive income in which case the related tax is recognized either directly in equity or other comprehensive income accordingly.

Deferred tax assets and liabilities are recognized for future tax consequences attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases, unused tax losses and unused tax credits. Deferred tax assets are recognized only to the extent that it is probable that sufficient taxable profit will be available against which those unused tax losses, unused tax credits and deductible temporary differences can be utilized.

Deferred tax assets and liabilities are measured based on the tax rates that are expected to apply in the period that the asset is realized or the liability is settled, based on tax rates and tax laws that have been enacted or substantively enacted at the balance sheet date.

Current tax assets and liabilities are offset when (1) they arise from the same tax reporting entity or tax group of reporting entities, (2) the legally enforceable right to offset exists and (3) they are intended to be settled net or realized simultaneously.

Deferred tax assets and liabilities are offset when the legally enforceable right to offset current tax assets and liabilities exists and the deferred tax assets and liabilities relate to income taxes levied by the same taxing authority on either the same tax reporting entity or tax group of reporting entities.

Deferred tax liabilities are provided on taxable temporary differences arising from investments in subsidiaries, branches and associates and interests in joint ventures except when the timing of the reversal of the temporary difference is controlled by the Group and it is probable that the difference will not reverse in the foreseeable future. Deferred income tax assets are provided on deductible temporary differences arising from such investments only to the extent that it is probable that the differences will reverse in the foreseeable future and sufficient taxable income will be available against which those temporary differences can be utilized.

Deferred tax related to fair value remeasurement of financial assets classified as FVTOCI, cash flow hedges and other items, which are charged or credited directly to other comprehensive income, is also credited or charged directly to other comprehensive income and subsequently recognized in the Consolidated Statement of Income once the underlying transaction or event to which the deferred tax relates is recognized in the Consolidated Statement of Income.

For share-based payment transactions, the Group may receive a tax deduction related to the compensation paid in shares. The amount deductible for tax purposes may differ from the cumulative compensation expense recorded. At any reporting date, the Group must estimate the expected future tax deduction based on the current share price. The associated current and deferred tax consequences are recognized as income or expense in the consolidated statement of Income for the period. If the amount deductible, or expected to be deductible, for tax purposes exceeds the cumulative compensation expense, the excess tax benefit is recognized directly in equity.

Critical accounting estimates – In determining the amount of deferred tax assets, the Group uses historical tax capacity and profitability information and, if relevant, forecasted operating results based upon approved business plans, including a review of the eligible carry-forward periods, available tax planning opportunities and other relevant considerations. The analysis of the historical tax capacity includes the determination as to whether a period of past profits or a history of recent losses exists at the reporting date. The determination of a period of past profits or a history of recent losses is based on the pre-tax results adjusted for permanent differences and typically covers the current and the two preceding financial years. Each quarter, the Group re-evaluates its estimate related to deferred tax assets.

The Group believes that the accounting estimate related to the deferred tax assets is a critical accounting estimate because the underlying assumptions can change from period to period and requires significant management judgment. For example, tax law changes, changes in the historical tax capacity or variances in future projected operating performance could result in a change of the carrying amount of a deferred tax asset. If the Group was not able to realize all or part of its net deferred tax assets in the future, an adjustment to its deferred tax assets would be charged to income tax expense or directly to equity in the period such determination was made. If the Group was to recognize previously unrecognized deferred tax assets in the future, an adjustment to its deferred tax asset would be credited to income tax expense or directly to equity in the period such determination was made.

The use of estimates is also important in determining provisions for potential losses that may arise from uncertain income tax positions. The Group estimates and provides for potential losses that may arise out of uncertain income tax positions, in accordance with IAS 12, "Income Taxes" and IFRIC 23, "Uncertainty over Income Tax Treatment". Significant judgment is required in making these estimates and the Group's final liabilities may ultimately be materially different.

For further information on the Group's deferred taxes (including quantitative disclosures on recognized deferred tax assets) see Note 34 "Income Taxes".

Business combinations and non-controlling Interests

The Group uses the acquisition method to account for business combinations. At the date the Group obtains control of the subsidiary, the cost of an acquisition is measured at the fair value of the consideration given, including any cash or non-cash consideration (equity instruments) transferred, any contingent consideration, any previously held equity interest in the acquiree and liabilities incurred or assumed. The excess of the aggregate of the cost of an acquisition and any non-controlling interests in the acquiree over the Group's share of the fair value of the identifiable net assets acquired is recorded as goodwill. If the aggregate of the acquisition cost and any non-controlling interests is below the fair value of the identifiable net assets (negative goodwill), a gain is reported in other income. Acquisition-related costs are recognized as expenses in the period in which they are incurred.

In business combinations achieved in stages ("step acquisitions"), a previously held equity interest in the acquiree is remeasured to its acquisition-date fair value and the resulting gain or loss, if any, is recognized in profit or loss. Amounts recognized in prior periods in other comprehensive income associated with the previously held investment would be recognized on the same basis as would be required if the Group had directly disposed of the previously held equity interest.

Non-controlling interests are shown in the consolidated balance sheet as a separate component of equity, which is distinct from the Group's shareholders' equity. The net income attributable to non-controlling interests is separately disclosed on the face of the Consolidated Statement of Income. Changes in the ownership interest in subsidiaries which do not result in a change of control are treated as transactions between equity holders and are reported in additional paid-in capital ("APIC").

Non-current assets held for sale

Individual non-current assets (and disposal groups) are classified as held for sale if they are available for immediate sale in their present condition subject only to the customary sales terms of such assets (and disposal groups) and their sale is considered highly probable. For a sale to be highly probable, management must be committed to a sales plan and be actively looking for a buyer and has no substantive regulatory approvals outstanding. Furthermore, the assets (and disposal groups) must be actively marketed at a reasonable sales price in relation to their current fair value and the sale should be expected to be completed within one year. Non-current non-financial assets (and disposal groups) which meet the criteria for held for sale classification are measured at the lower of their carrying amount and fair value less costs of disposal and are presented within "Other assets" and "Other liabilities" in the balance sheet. Financial assets and liabilities meeting the criteria continue to be measured in accordance with IFRS 9. The comparatives are not represented when non-current assets (and disposal groups) are classified as held for sale.

Property and equipment

Property and equipment includes own-use properties, leasehold improvements, furniture and equipment and software (operating systems only). Right-of-use assets are presented together with property and equipment on the Group's consolidated balance sheet. Own-use properties are carried at cost less accumulated depreciation and accumulated impairment losses. Depreciation is generally recognized using the straight-line method over the estimated useful lives of the assets. The range of estimated useful lives is 25 to 50 years for property and 3 to 10 years for furniture and equipment (including initial improvements to purchased buildings). Leasehold improvements are capitalized and subsequently depreciated on a straight-line basis over the shorter of the term of the lease and the estimated useful life of the improvement, which generally ranges from 3 to 25 years. Depreciation of property and equipment is included in general and administrative expenses. Maintenance and repairs are also charged to general and administrative expenses. Gains and losses on disposals are included in other income.

Property and equipment are assessed for any indication of impairment at each quarterly reporting date. If such indication exists, the recoverable amount, which is the higher of fair value less costs of disposal and value in use, must be estimated and an impairment charge is recorded to the extent the recoverable amount is less than the carrying amount. Value in use is the present value of the future cash flows expected to be derived from the asset. After the recognition of impairment of an asset, the depreciation charge is adjusted in future periods to reflect the asset's revised carrying amount. If an impairment is later reversed, the depreciation charge is adjusted prospectively.

Financial guarantees

Financial guarantee contracts are contracts that require the issuer to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payments when due in accordance with the terms of a debt instrument.

Financial guarantees written

The Group has chosen to apply the fair value option to certain written financial guarantees that are managed on a fair value basis. Financial guarantees that the Group has not designated at fair value are initially recognized at fair value on the date the guarantee is given. Subsequent to initial recognition, the Group's liabilities under such guarantees are measured at the higher of the amount initially recognized, less cumulative amortization, and the best estimate of the expenditure required to settle any financial obligation as of the balance sheet date. These estimates are determined by management based on experience with similar transactions and history of past losses.

Any increase in the liability relating to guarantees is recorded in the Consolidated Statement of Income in provision for credit losses.

Financial guarantees purchased

Purchased financial guarantees result in reimbursements under IAS 37 to the extent that the financial guarantee is entered into to mitigate the credit exposure from debt instruments with HTC or HTC&S business models. This results in recognition of a reimbursement asset for subsequent increases in the expected credit losses, to the extent it is virtually certain that the purchased financial guarantee will reimburse the Group for the loss incurred. Accordingly, when the credit risk of the borrower significantly deteriorates a reimbursement asset is recognized equal to the life-time expected credit losses and is presented as Other Assets in the Group's Consolidated Balance Sheet. The corresponding reimbursement gain is recognized as a reduction in the Provision for credit losses in the Group's Consolidated Statement of Income.

Purchased financial guarantees entered into to mitigate credit exposure from debt instruments allocated to HTC or HTC&S business models may also be embedded in Collateralized Loan Obligations (CLO's) issued by the Group. Such embedded guarantees are not accounted for separately as a reimbursement asset and are instead accounted as part of the CLO's liability held at amortized cost. The Group regularly revises its estimated contractual redemption payment (including the benefit of such embedded guarantees) from the CLO when the credit risk of a borrower covered by the embedded financial guarantee in the CLO significantly deteriorates. The revision is based on the life-time expected credit losses of the debt instrument (to the extent covered by the CLO).

Purchased financial guarantees entered into to mitigate credit exposure from debt instruments included in the Other business model are accounted for at fair value through profit or loss.

Leasing transactions

The Group enters into lease contracts, predominantly for land and buildings, as a lessee. Other categories are company cars and technical/IT equipment.

The Group assesses at contract inception whether a contract is, or contains, a lease. That is, if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

The Group applies a single recognition and measurement approach for all leases with a term of more than 12 months, unless the underlying asset is of low value. As a lessee, at the lease commencement date, the Group recognizes a right-of-use asset representing its right to use the underlying leased asset and a lease liability representing its obligation to make lease payments.

The right-of-use asset is measured at cost, less any accumulated depreciation and impairment losses, and adjusted for any re-measurement of lease liabilities. The cost of right-of-use assets includes the amount of lease liabilities, adjusted for any lease payments made at or before the commencement date, plus any initial direct costs incurred and an estimate of costs to dismantle and remove the underlying asset or to restore the site on which it is located, less any lease incentives received. Right-of-use assets are depreciated on a straight-line basis over the lease term.

The lease liability is measured at the present value of lease payments to be made over the lease term. The lease payments include fixed payments (including in substance fixed payments) less any lease incentives receivable and variable lease payments that depend on an index or a rate. Variable lease payments that do not depend on an index or a rate are recognized as expenses in the period in which the event or condition that triggers the payment occurs.

In calculating the present value of lease payments, the Group uses its incremental borrowing rate at the lease commencement date because the interest rate implicit in the lease is not readily determinable. After the commencement date, the amount of lease liabilities is increased to reflect the accretion of interest and reduced for the lease payments made. In addition, the carrying amount of lease liabilities is re-measured if there is a modification, a change in the lease term or a change in the lease payments (e.g., changes to future payments resulting from a change in an index or rate used to determine such lease payments).

Right-of-use assets are assessed for any indication of impairment at each quarterly reporting date. If such indication exists, the recoverable amount, which is the fair value less costs of disposal, must be estimated and an impairment charge is recorded to the extent the recoverable amount is less than the carrying amount. As right-of-use assets do not have independently generated cash flows to calculate its value in use, the Group considers any sublease income that could reasonably be earned. After the recognition of impairment of an asset, the depreciation charge is adjusted in future periods to reflect the asset's revised carrying amount. If an impairment is later reversed, the depreciation charge is adjusted prospectively.

The Group presents right-of-use assets in "Property and Equipment" and lease liabilities in "Other Liabilities".

The Group applies the short-term lease recognition exemption to its short-term leases, i.e., those leases that have a lease term of 12 months or less from the commencement date. It also applies the lease of low-value assets recognition exemption to leases of technical/IT equipment that are considered to be low value. Lease payments on short-term leases and leases of low value assets are recognized as expense on a straight-line basis over the lease term.

Employee benefits

Pension benefits

The Group provides a number of pension plans. In addition to defined contribution plans, there are retirement benefit plans accounted for as defined benefit plans. The assets of all the Group's defined contribution plans are held in independently administered funds. Contributions are generally determined as a percentage of salary and are expensed based on employee services rendered, generally in the year of contribution.

All retirement benefit plans accounted for as defined benefit plans are valued using the projected unit-credit method to determine the present value of the defined benefit obligation and the related service costs. Under this method, the determination is based on actuarial calculations which include assumptions about demographics, salary increases and interest and inflation rates. Actuarial gains and losses are recognized in other comprehensive income and presented in equity in the period in which they occur. The majority of the Group's benefit plans is funded.

For the Group's most significant pension plans in the key countries, the discount rate used at each measurement date is set based on a high-quality corporate bond yield curve – derived based on bond universe information sourced from reputable third-party index data providers and rating agencies – reflecting the timing, amount and currency of the future expected benefit payments for the respective plan.

Other post-employment benefits

In addition, the Group maintains unfunded contributory post-employment medical plans for a number of current and retired employees who are mainly located in the United States. These plans pay stated percentages of eligible medical and dental expenses of retirees after a stated deductible has been met. The Group funds these plans on a cash basis as benefits are due. Analogous to retirement benefit plans these plans are valued using the projected unit-credit method. Actuarial gains and losses are recognized in full in the period in which they occur in other comprehensive income and presented in equity.

Refer to Note 33 "Employee benefits" for further information on the accounting for pension benefits and other post-employment benefits.

Termination benefits

Termination benefits arise when employment is terminated by the Group before the normal retirement date or whenever an employee accepts voluntary redundancy in exchange for these benefits. The Group recognizes termination benefits as a liability and an expense if the Group is demonstrably committed to a detailed formal plan without realistic possibility of withdrawal. In the case of an offer made to encourage voluntary redundancy, termination benefits are measured based on the number of employees expected to accept the offer. Benefits falling due more than twelve months after the end of the reporting period are discounted to their present value. The discount rate is determined by reference to market yields on high-quality corporate bonds.

Share-based compensation

Compensation expense for awards classified as equity instruments is measured at the grant date based on the fair value of the share-based award. For share awards, the fair value is the quoted market price of the share reduced by the present value of the expected dividends that will not be received by the employee and adjusted for the effect, if any, of restrictions beyond the vesting date. In case an award is modified such that its fair value immediately after modification exceeds its fair value immediately prior to modification, a remeasurement takes place and the resulting increase in fair value is recognized as additional compensation expense.

The Group records the offsetting amount to the recognized compensation expense in additional paid-in capital ("APIC"). Compensation expense is recorded on a straight-line basis over the period in which employees perform services to which the awards relate or over the period of the tranches for those awards delivered in tranches. Estimates of expected forfeitures are periodically adjusted in the event of actual forfeitures or for changes in expectations. The timing of expense recognition relating to grants which, due to early retirement provisions, include a nominal but non-substantive service period are accelerated by shortening the amortization period of the expense from the grant date to the date when the employee meets the eligibility criteria for the award, and not the vesting date. For awards that are delivered in tranches, each tranche is considered a separate award and amortized separately.

Compensation expense for share-based awards payable in cash is remeasured to fair value at each balance sheet date and recognized over the vesting period in which the related employee services are rendered. The related obligations are included in other liabilities until paid.

Government Grants

The Group recognizes income from government grants when there is reasonable assurance that it will receive the grant and will comply with the conditions attached to the grant. The benefit is recognized in the period in which the grant is intended to compensate the Group for related costs and presented as a reduction of the related expense.

The Group considers the benefits that arise from borrowing under TLTRO III as government grant from a below-market loan under IAS 20. The income from the government grant is recognized in interest income in the period in which the grant is intended to compensate the Group for the related borrowing costs. The Group previously accounted for all TLTRO III related benefits as government grant in the scope of IAS 20. In March 2022 the IASB approved the IFRS Interpretations Committee (IFRS IC) final agenda decision on accounting for TLTRO which clarified the accounting for below-market loans in the scope of IAS 20. The agenda decision stated that the component that is subject to IAS 20 is limited to the difference between the initial carrying amount of the financial liability that arises from borrowing under TLTRO III and the proceeds received. The initial carrying amount of the TLTRO III related financial liability differs from the proceeds received where at the time of initial recognition the Group has established reasonable assurance about the future receipt of the related benefits. Any residual benefits are accounted for in line with IFRS 9 under the financial liability's effective interest rate. Implementation of the IFRS IC agenda decision resulted in an adjustment in the Group's accounting treatment such that the benefits that arise from the base rate discount continue to be accounted for as government grant under IAS 20, while the benefits that arise from meeting the new lending discounts described above are accounted for under IFRS 9. This is because the Group was unable to establish reasonable assurance of meeting the net lending thresholds under the new lending discounts at the time of initial borrowing.

For further information on the benefit recognized by the Group from the TLTRO III refinancing program see Note 5 "Net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss".

Obligations to purchase common shares

Forward purchases of Deutsche Bank shares and written put options where Deutsche Bank shares are the underlying, are reported as obligations to purchase common shares if the number of shares is fixed and physical settlement for a fixed amount of cash is required. At inception, the obligation is recorded at the present value of the settlement amount of the forward or option. For forward purchases and written put options of Deutsche Bank shares, a corresponding charge is made to shareholders' equity and reported as equity classified as an obligation to purchase common shares.

The liabilities are accounted for on an accrual basis, and interest costs, which consist of time value of money and dividends, on the liability are reported as interest expense. Upon settlement of such forward purchases and written put options, the liability is extinguished and the charge to equity is reclassified to common shares in treasury.

Deutsche Bank common shares subject to such forward contracts are not considered to be outstanding for purposes of basic earnings per share calculations but are for dilutive earnings per share calculations to the extent that they are, in fact, dilutive.

Option and forward contracts on Deutsche Bank shares are classified as equity if the number of shares is fixed and physical settlement is required. All other contracts in which Deutsche Bank shares are the underlying are recorded as financial assets or liabilities at fair value through profit or loss.

Consolidated statement of cash flows

For purposes of the consolidated statement of cash flows, the Group's cash and cash equivalents include highly liquid investments that are readily convertible into cash and which are subject to an insignificant risk of change in value. Such investments include cash and balances at central banks and demand deposits with banks.

There are various circumstances in which cash and cash equivalent balances held by an entity are not available for use by the Group. Examples include cash and cash equivalent balances held by a subsidiary that operates in a country where exchange controls or other legal restrictions apply such that the balances are not available for general use by the Group or its subsidiaries.

The Group's assignment of cash flows to the operating, investing or financing category depends on the business model ("management approach"). For the Group the primary operating activity is to manage financial assets and financial liabilities. Therefore, the issuance and management of long-term borrowings is a core operating activity which is different than for a non-financial company, where borrowing is not a principal revenue producing activity and thus is part of the financing category.

The Group views the issuance of senior long-term debt as an operating activity. Senior long-term debt comprises structured notes and asset-backed securities, which are designed and executed by the Corporate Bank and Investment Bank business line segments and which are revenue generating activities. The other component is debt issued by Treasury, which is considered interchangeable with other funding sources. All funding costs are allocated to business activities to establish their profitability.

Cash flows related to subordinated long-term debt and trust preferred securities are viewed differently than those related to senior-long term debt because they are managed as an integral part of the Group's capital, primarily to meet regulatory capital requirements. As a result, they are not interchangeable with other operating liabilities, but can only be interchanged with equity and thus are considered part of the financing category.

The amounts shown in the consolidated statement of cash flows do not precisely match the movements in the consolidated balance sheet from one period to the next as they exclude non-cash items such as movements due to foreign exchange translation and movements due to changes in the group of consolidated companies.

Movements in balances carried at fair value through profit or loss represent all changes affecting the carrying value. This includes the effects of market movements and cash inflows and outflows. The movements in balances carried at fair value are usually presented in operating cash flows.

02 – Recently adopted and new accounting pronouncements

Recently adopted accounting pronouncements

The following are those accounting pronouncements which are relevant to the Group and which have been adopted during 2022 in the preparation of these consolidated financial statements.

IAS 37 “Provisions, Contingent Liabilities and Contingent Assets”

On January 1, 2022, the Group adopted amendments to IAS 37, “Provisions, Contingent Liabilities and Contingent Assets” which clarified what costs an entity considers in assessing whether a contract is onerous. The amendments specified that the ‘cost of fulfilling’ a contract comprises the ‘costs that relate directly to the contract’. Costs that relate directly to a contract can either be incremental costs of fulfilling that contract or an allocation of other costs that relate directly to fulfilling contracts. The amendments did not have a material impact on the Group’s consolidated financial statements.

Improvements to IFRS 2018-2020 Cycles

On January 1, 2022, the Group adopted amendments to multiple IFRS standards, which resulted from the IASB’s annual improvement project for the 2018-2020 cycles. This comprised amendments that resulted in accounting changes for presentation, recognition or measurement purposes as well as terminology or editorial amendments related to IFRS 1 “First-time Adoption of International Financial Reporting Standards”, IFRS 9 “Financial Instruments”, IFRS 16 “Leases” and IAS 41 “Agriculture”. The amendments to IFRS 9 clarified which fees an entity includes when assessing whether to derecognize a financial liability. The amendments did not have a material impact on the Group’s consolidated financial statements.

New accounting pronouncements

The following accounting pronouncements were not effective as of December 31, 2022 and therefore have not been applied in preparing these consolidated financial statements.

IFRS 16 “Leases”

In September 2022, the IASB issued amendments to IFRS 16 “Leases” that clarify how a seller-lessee subsequently measures sale and leaseback transactions that satisfy the IFRS 15 requirements to be accounted for as a sale. The amendments are effective for annual periods beginning on or after January 1, 2024 with early adoption permitted. The amendment is not expected to have a material impact on the Group’s consolidated financial statements. These amendments have yet to be endorsed by the EU.

IFRS 17 “Insurance Contracts”

In May 2017, the IASB issued IFRS 17, “Insurance Contracts”, which establishes the principles for the recognition, measurement, presentation and disclosure of insurance contracts within the scope of the standard. IFRS 17 replaces IFRS 4 which has given companies dispensation to carry on accounting for insurance contracts using national accounting standards, resulting in a multitude of different approaches. IFRS 17 solves the comparison problems created by IFRS 4 by requiring all insurance contracts to be accounted for in a consistent manner, benefiting both investors and insurance companies. Insurance obligations will be accounted for using current values – instead of historical cost. The information will be updated regularly, providing more useful information to users of financial statements. IFRS 17 is effective for annual periods beginning on or after January 1, 2023. Based on the Group’s current business activities IFRS 17 will not have a material impact on the Group’s consolidated financial statements.

In June 2020, the IASB issued amendments to IFRS 17 “Insurance Contracts” that address concerns and implementation challenges that were identified after IFRS 17 was published in 2017. The amendments are effective for annual periods beginning on or after January 1, 2023 with early adoption permitted.

In December 2021, the IASB issued amendments to IFRS 17 “Insurance Contracts” that are narrow-scope amendments to the transition requirements of IFRS 17 for entities that first apply IFRS 17 and IFRS 9 at the same time. The amendments (if elected) will be applicable when IFRS 17 is first applied.

IAS 12 “Income Taxes”

In May 2021, the IASB issued amendments to IAS 12 “Income Taxes”. These amendments change the deferred tax treatment related to assets and liabilities in a single transaction such that they introduce an exemption from the initial recognition

exemption provided in IAS 12.15(b) and IAS 12.24. Accordingly, the initial recognition exemption does not apply to transactions in which both deductible and taxable temporary differences arise on initial recognition that result in the recognition of equal deferred tax assets and liabilities. The amendments will be effective for annual periods beginning on or after January 1, 2023 with early adoption permitted. Neither of these amendments will have a material impact on the Group's consolidated financial statements.

IAS 1 "Presentation of Financial Statements"

In January 2020 and July 2020, the IASB issued amendments to IAS 1 "Presentation of Financial Statements: Classification of Liabilities as Current or Non-Current". They clarify that the classification of liabilities as current or non-current should be based on rights that are in existence at the end of the reporting period. They also clarify that the classification is unaffected by expectations about whether an entity will exercise its right to defer settlement of a liability and make clear that settlement refers to the transfer to the counterparty of cash, equity instruments, other assets or services. The amendments are expected to be effective for annual periods beginning on or after January 1, 2024 with early adoption permitted. They will not have a material impact on the Group's consolidated financial statements. The amendments have yet to be endorsed by the EU.

In October 2022, the IASB issued a further amendment to IAS 1 that modifies the requirements described above on how an entity classifies debt and other financial liabilities as current or non-current in particular circumstance. Accordingly, it clarifies that only covenants with which an entity is required to comply on or before the reporting date affect the classification of a liability as current or non-current. In line with the previous amendments, the new amendments are expected to be effective for annual periods beginning on or after January 1, 2024 with early adoption permitted. They will not have a material impact on the Group's consolidated financial statements. The amendments have yet to be endorsed by the EU.

In February 2021, the IASB issued amendments to IAS 1 and "IFRS Practice Statement 2" that are intended to provide guidance on deciding which accounting policies to disclose in the financial statements. Accordingly, an entity is now required to disclose its material accounting policies instead of its significant accounting policies. This will be effective for annual periods beginning on or after January 1, 2023 with early adoption permitted. The amendments will not have an impact on the Group's results but will lead to changes to the Group's disclosure of its accounting policies.

03 – Acquisitions and dispositions

Business combinations

During the years 2022 and 2020, the Group did not undertake any acquisitions accounted for as business combinations.

In the third quarter 2021, the Group had completed the acquisition of 100 % of the shares in Better Payment Germany GmbH, a Berlin-based early-stage payment service provider. Through this acquisition, the Group intended to expand its market share in payment processing and acceptance. The fair value of the purchase price paid for the acquisition consisted of € 5 million cash and an earn-out consideration of € 3 million contingent upon a number of KPIs to be achieved within 3 years following the acquisition. As part of the preliminary purchase price allocation, the Group recorded goodwill of € 5 million assigned to the Corporate Bank cash-generating unit (CGU). Given the value of the Corporate Bank CGU, the new goodwill was considered impaired and immediately written off in 2021 (refer to Note 23 "Goodwill and Other Intangible Assets").

Dispositions

The Group finalized several dispositions of subsidiaries/businesses during 2022, 2021 and 2020. These disposals were mainly comprised of businesses the Group had previously classified as held for sale, including the completion of the transfer of the digital investment platform of DWS as part of its partnership with BlackFin and the sale of the Italian financial advisors business to Zurich Italy in 2022, the transfer of the Global Prime Finance & Electronic Equities platform to BNP Paribas in 2021 and the sale of Postbank Systems AG in 2020. For more detail, please refer to Note 24 "Non-Current Assets and Disposal Groups Held for Sale". The total consideration received for these dispositions (thereof in cash) in 2022, 2021 and 2020 was € 488 million (cash € 439 million), € 34 million (cash € 0 million) and € 7 million (cash € 7 million), respectively. The table below shows the assets and liabilities that were included in these disposals.

in € m.	2022	2021	2020
Cash and cash equivalents	1,126	0	2
All remaining assets	659	3,507	7
Total assets disposed	1,785	3,507	9
Total liabilities disposed	1,676	8,102	79

04 – Business segments and related information

The Group's segmental information has been prepared in accordance with the "management approach", which requires presentation of the segments on the basis of the internal management reports of the entity which are regularly reviewed by the chief operating decision maker, which is the Deutsche Bank Management Board, in order to allocate resources to a segment and to assess its financial performance.

Business segments

The Group's segment reporting follows the organizational structure as reflected in its internal management reporting systems, which are the basis for assessing the financial performance of the business segments and for allocating resources to the business segments.

The bank's business operations are organized under the divisional structure comprising the following corporate divisions:

- Corporate Bank
- Investment Bank
- Private Bank
- Asset Management
- Capital Release Unit
- Corporate & Other

Compared to the prior year, the segmental information for the corporate divisions Corporate Bank, Investment Bank, Asset Management, Capital Release Unit and Corporate & Other remained unchanged in its scope, while the presentation of revenues in the Private Bank was changed. The related segment information is outlined below.

Corporate Bank reports revenues in the categories Corporate Treasury Services, Institutional Client Services and Business Banking.

Investment Bank reports revenues in the categories Fixed Income, Currency Sales & Trading and, Origination & Advisory, as well as Other.

Private Bank reports revenues in the categories Private Bank Germany and International Private Bank. Commencing from the second quarter 2022 reporting, the breakdown of revenues within the International Private Bank was refined to further align the reporting structure to the client coverage model. International Private Bank revenues are now categorized into the client segments "Wealth Management & Bank for Entrepreneurs" and "Premium Banking". "Wealth Management & Bank for Entrepreneurs" combines the coverage of private banking, high-net-worth and ultra-high-net-worth clients, as well as business clients that are covered as part of the Bank for Entrepreneurs proposition. "International Private Bank Premium Banking" includes retail and affluent customers as well as commercial banking clients (i.e., all small business clients and small sized corporate clients that are not covered as part of the Bank for Entrepreneurs). Prior year comparatives are presented in the current structure.

Asset Management reports revenues in the categories Management Fees, Performance and Transaction Fees and Other.

Capital Release Unit includes the remaining assets transferred in from Equities Sales & Trading business, lower yielding fixed income positions, particularly in Rates, former Corporate & Investment Bank Non-Strategic portfolio as well as a legacy loan portfolio from the former Private & Commercial Bank in Poland.

Corporate & Other includes revenues, costs and resources held centrally that are not allocated to the individual business segments as well as valuation and timing differences that arise on derivatives used to hedge the Group's balance sheet. These are accounting impacts, and the valuation losses are expected to be recovered over time as the underlying instruments approach maturity.

In addition, based on management decisions during the reporting period further divisional changes were introduced. The prior years' segmental information is presented in the current structure.

Measurement of segment profit or loss

Segment reporting requires a presentation of the segment results based on management reporting methods, including a reconciliation between the results of the business segments and the consolidated financial statements, which is presented in the “Segmental Results of Operations” section within this note. The information provided about each segment is based on internal management reporting about segment profit or loss, assets and other information which is regularly reviewed by the chief operating decision maker. Segment assets are presented in the Group’s internal management reporting based on a consolidated view, i.e., the amounts do not include intersegment balances. The Group’s internal management reporting does not consider segment liabilities or interest expense separately. Similarly, depreciation and amortization, tax expenses and other comprehensive income are not presented separately internally and are therefore not disclosed here.

Non-IFRS compliant accounting methods used in the Group’s management reporting represent either valuation or classification differences. The largest valuation differences relate to measurement at fair value in management reporting versus measurement at amortized cost under IFRS and to the recognition of trading results from own shares in revenues in management reporting (in Investment Bank) and in equity under IFRS. The major classification difference relates to noncontrolling interest, which represents the net share of minority shareholders in revenues, provision for credit losses, noninterest expenses and income tax expenses. Noncontrolling interest is reported as a component of the profit before tax of the businesses in management reporting (with a reversal in Corporate & Other) and a component of net income appropriation under IFRS.

Since the Group’s business activities are diverse in nature and its operations are integrated, certain estimates and judgments have been made to apportion revenue and expense items among the business segments.

The management reporting systems allocate the Group’s external net interest income according to the value of funding consumed or provided by each business segment’s activities, in accordance with the bank’s internal funds transfer pricing framework. Furthermore, to retain comparability with those competitors that have legally independent units with their own equity funding, the Group allocates a net notional interest benefit on its consolidated capital, in line with each segment’s proportion of average shareholders’ equity.

Management uses certain measures for equity and related ratios as part of its internal reporting system because it believes that these measures provide it with a useful indication of the financial performance of the business segments. The Group discloses such measures to provide investors and analysts with further insight into how management operates the Group’s businesses and to enable them to better understand the Group’s results.

Allocation of Average Shareholder’s Equity

Shareholders’ equity is fully allocated to the Group’s segments based on the regulatory capital demand of each segment. Regulatory capital demand reflects the combined contribution of each segment to the Groups’ Common Equity Tier 1 (CET1) ratio, the Groups’ leverage ratio and the Group’s capital loss under stress. Contributions in each of the three dimensions are weighted to reflect their relative importance and level of constraint for the Group. Contributions to the CET1 ratio and the leverage ratio are measured through risk-weighted assets and leverage ratio exposure. The Group’s capital loss under stress is a measure of the Group’s overall economic risk exposure under a defined stress scenario. Goodwill and other intangible assets are directly attributed to the Group’s segments in order to allow the determination of allocated tangible shareholders’ equity and the respective returns. Shareholders’ equity and tangible shareholders’ equity is allocated on a monthly basis and averaged across quarters and for the full year.

Strategic Liquidity Reserve Profit and Loss Allocation

Commencing from the first quarter of 2022, the methodology for divisional intra-year allocations of profit or loss earned on the Strategic Liquidity Reserves has been refined. As part of the introduction of the new methodology, the intra-year profit and loss volatility is held centrally in Corporate & Other in order to better reflect the underlying performance of the business divisions. The implementation of the new methodology does not impact the overall group revenues or the annual business allocations, therefore the full year results for 2022, 2021 and 2020 are not impacted.

U.S. Tax Exempt Securities

Net interest income as a component of net revenues, profit (loss) before tax and related ratios are presented on a fully taxable-equivalent basis for US tax-exempt securities for the Investment Bank. This enables management to measure performance of taxable and tax-exempt securities on a comparable basis. This presentation resulted in an increase in Investment Bank net interest income of € 33 million for full year 2022, € 40 million for full year 2021 and € 45 million for full year 2020. This increase is offset in Group consolidated figures through a reversal in Corporate & Other. The tax rate used in determining the fully taxable-equivalent of net interest income in respect of the majority of the U.S. tax-exempt securities is 21 % for 2022, 2021 and 2020.

Infrastructure Full-time Employees realignment

In the third quarter of 2021, approximately 9,000 FTEs moved from Corporate & Other to the operating business segments driven by the bank's decision that the Chief Operating Office will no longer be a separate Management Board function. Accordingly business-related parts of Chief Operating Office that support the Investment Bank and the Corporate Bank, which were previously run in Infrastructure, moved to those divisions. Comparative segmental financial information is presented accordingly. This change did not result in a material financial impact at a segment level, as costs are allocated from Corporate & Other to the operating business segments that are using the service of the respective infrastructure functions and with this move the costs are directly incurred by the divisions rather than being charged from Corporate & Other.

Segmental results of operations

The following tables present the results of the Group's business segments, including the reconciliation to the consolidated results of operations under IFRS.

	2022						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Net revenues¹	6,335	10,016	9,155	2,608	(28)	(1,024)	27,063
Provision for credit losses	335	319	583	(2)	(17)	8	1,226
Noninterest expenses							
Compensation and benefits	1,421	2,376	2,791	899	60	3,165	10,712
General and administrative expenses	2,547	3,805	3,915	869	864	(2,272)	9,728
Impairment of goodwill and other intangible assets	0	0	0	68	0	0	68
Restructuring activities	(19)	15	(113)	0	(2)	0	(118)
Total noninterest expenses	3,949	6,196	6,593	1,836	922	893	20,390
Noncontrolling interests	0	15	0	174	0	(190)	0
Profit (loss) before tax	2,051	3,487	1,979	598	(932)	(1,736)	5,447
Cost/income ratio	62%	62%	72%	70%	N/M	N/M	75%
Assets²	257,900	676,714	332,524	10,150	61,823	5,107	1,344,217
Additions to non-current assets	3	4	177	41	0	2,269	2,494
Risk-weighted assets	74,303	139,442	87,602	12,864	24,284	21,508	360,003
Leverage exposure³	320,767	529,506	344,396	9,462	22,028	14,325	1,240,483
Average allocated shareholders' equity	11,901	26,032	13,584	5,459	3,018	115	60,108
Post-tax return on average shareholders' equity ⁴	12 %	9 %	10 %	7 %	(23) %	N/M	8 %
Post-tax return on average tangible shareholders' equity ⁴	12 %	9 %	11 %	17 %	(24) %	N/M	9 %
¹ includes:							
Net interest income	3,628	3,467	5,223	(65)	(227)	1,958	13,983
Net income (loss) from equity method investments	4	50	27	66	6	0	152
² includes:							
Equity method investments	90	501	99	415	16	4	1,124

N/M – Not meaningful

³ The leverage ratio exposure is calculated according to CRR as applicable at the reporting date; starting with September 30, 2020, the Group was allowed to exclude certain Euro-based exposures facing Eurosystem central banks from the leverage ratio exposure based on the ECB-decision (EU) 2020/1306 and EU 2021/1074; this exclusion applied until March 31, 2022; the segmental leverage exposures are presented without that exclusion.

⁴ The post-tax return on average tangible shareholders' equity and average shareholders' equity at the Group level reflects the reported effective tax rate for the Group, which was (2) % for the year ended December 31, 2022; for the post-tax return on average tangible shareholders' equity and average shareholders' equity of the segments, the Group effective tax rate was adjusted to exclude the impact of permanent differences not attributed to the segments, so that the segment tax rates were 28 % for the year ended December 31, 2022; for further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this Annual Report.

	2021						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Net revenues¹	5,151	9,631	8,234	2,708	26	(212)	25,538
Provision for credit losses	(3)	104	446	5	(42)	5	515
Noninterest expenses							
Compensation and benefits	1,447	2,197	2,813	822	128	3,012	10,418
General and administrative expenses	2,649	3,587	4,447	840	1,306	(2,009)	10,821
Impairment of goodwill and other intangible assets	5	0	0	0	0	0	5
Restructuring activities	42	47	173	2	(2)	(0)	261
Total noninterest expenses	4,143	5,831	7,433	1,664	1,432	1,002	21,505
Noncontrolling interests	0	(17)	0	223	0	(206)	0
Profit (loss) before tax	1,011	3,714	355	816	(1,364)	(1,014)	3,518
Cost/income ratio	80 %	61 %	90 %	61 %	N/M	N/M	84 %
Assets ²	245,716	615,906	310,496	10,387	131,775	10,425	1,324,705
Additions to non-current assets	17	6	149	32	1	1,734	1,939
Risk-weighted assets	65,406	140,600	85,366	14,415	28,059	17,783	351,629
Leverage exposure (fully loaded) ³	299,892	530,361	320,692	10,678	38,830	22,761	1,124,667
Average allocated shareholders' equity	10,301	24,181	12,663	4,815	4,473	104	56,537
Post-tax return on average shareholders' equity ⁴	6 %	10 %	1 %	12 %	(23) %	N/M	4 %
Post-tax return on average tangible shareholders' equity ⁴	7 %	11 %	1 %	30 %	(23) %	N/M	4 %
¹ includes:							
Net interest income	2,605	3,332	4,601	(5)	58	526	11,117
Net income (loss) from equity method investments	3	(34)	40	81	7	1	98
² includes:							
Equity method investments	72	462	180	349	25	4	1,091

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year

³ The leverage ratio exposure is calculated according to CRR as applicable at the reporting date; starting with September 30, 2020, the Group was allowed to exclude certain Euro-based exposures facing Eurosystem central banks from the leverage ratio exposure based on the ECB-decision (EU) 2020/1306 and EU 2021/1074; this exclusion applied until March 31, 2022; the segmental leverage exposures are presented without that exclusion.

⁴ The post-tax return on average tangible shareholders' equity and average shareholders' equity at the Group level reflects the reported effective tax rate for the Group, which was 26 % for the year ended December 31, 2021; for the post-tax return on average tangible shareholders' equity and average shareholders' equity of the segments, the Group effective tax rate was adjusted to exclude the impact of permanent differences not attributed to the segments, so that the segment tax rates were 28 % for the year ended December 31, 2021; for further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this Annual Report.

	2020						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Net revenues¹	5,146	9,286	8,126	2,229	(225)	(552)	24,011
Provision for credit losses	364	690	711	2	29	(4)	1,792
Noninterest expenses							
Compensation and benefits	1,402	2,079	2,867	740	168	3,215	10,471
General and administrative expenses	2,805	3,325	4,242	763	1,774	(2,651)	10,259
Impairment of goodwill and other intangible assets	0	0	0	0	0	0	0
Restructuring activities	28	14	413	22	5	3	485
Total noninterest expenses	4,235	5,418	7,522	1,526	1,947	568	21,216
Noncontrolling interests	0	11	0	157	(0)	(169)	0
Profit (loss) before tax	547	3,166	(108)	544	(2,200)	(947)	1,003
Cost/income ratio	82 %	58 %	93 %	68 %	N/M	N/M	88 %
Assets²	237,675	573,536	296,596	9,453	197,667	10,035	1,324,961
Additions to non-current assets	10	4	202	32	0	3,174	3,423
Risk-weighted assets	57,483	128,292	77,074	9,997	34,415	21,690	328,951
Leverage exposure (fully loaded) ³	273,959	476,097	307,746	4,695	71,726	29,243	1,078,268
Average allocated shareholders' equity	9,945	22,911	11,553	4,757	6,166	(23)	55,308
Post-tax return on average shareholders' equity ⁴	3 %	9 %	(1) %	8 %	(26) %	N/M	0 %
Post-tax return on average tangible shareholders' equity ⁴	3 %	10 %	(2) %	21 %	(27) %	N/M	0 %
¹ includes:							
Net interest income	2,883	3,325	4,499	1	61	779	11,548
Net income (loss) from equity method investments	3	22	23	63	9	1	120
² includes:							
Equity method investments	69	399	60	304	67	4	901

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

³ The leverage ratio exposure is calculated according to CRR as applicable at the reporting date; starting with September 30, 2020, the Group was allowed to exclude certain Euro-based exposures facing Eurosystem central banks from the leverage ratio exposure based on the ECB-decision (EU) 2020/1306 and EU 2021/1074; this exclusion applied until March 31, 2022; the segmental leverage exposures are presented without that exclusion.

⁴ The post-tax return on average tangible shareholders' equity and average shareholders' equity at the Group level reflects the reported effective tax rate for the Group, which was 39 % for the year ended December 31, 2020; for the post-tax return on average tangible shareholders' equity and average shareholders' equity of the segments, the Group effective tax rate was adjusted to exclude the impact of permanent differences not attributed to the segments, so that the segment tax rates were 28 % for the year ended December 31, 2020; for further information, please refer to "Supplementary Information (Unaudited): Non-GAAP Financial Measures" of this Annual Report.

Corporate Bank

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues							
Corporate Treasury Services	3,886	3,125	3,119	761	24	6	0
Institutional Client Services	1,586	1,299	1,280	287	22	19	1
Business Banking	863	726	747	136	19	(21)	(3)
Total net revenues	6,335	5,151	5,146	1,185	23	5	0
of which:							
Net interest income	3,628	2,605	2,883	1,022	39	(278)	(10)
Commissions and fee income	2,354	2,203	2,078	151	7	125	6
Remaining income	354	343	185	11	3	158	86
Provision for credit losses	335	(3)	364	338	N/M	(367)	N/M
Noninterest expenses							
Compensation and benefits	1,421	1,447	1,402	(25)	(2)	45	3
General and administrative expenses	2,547	2,649	2,805	(103)	(4)	(156)	(6)
Impairment of goodwill and other intangible assets	0	5	0	(5)	N/M	5	N/M
Restructuring activities	(19)	42	28	(61)	N/M	13	47
Total noninterest expenses	3,949	4,143	4,235	(193)	(5)	(92)	(2)
Noncontrolling interests	0	0	0	0	N/M	0	N/M
Profit (loss) before tax	2,051	1,011	547	1,040	103	464	85
Total assets (in € bn.) ¹	258	246	238	12	5	8	3
Loans (gross of allowance for loan losses, in € bn.)	122	122	115	(1)	(1)	8	7
Total employees (directly-managed, full-time equivalent)	13,980	13,292	13,393	688	5	(102)	(1)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances.

Investment Bank

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues							
Fixed Income, Currency (FIC) Sales & Trading	8,935	7,063	7,074	1,871	26	(11)	(0)
Debt Origination	412	1,573	1,500	(1,161)	(74)	73	5
Equity Origination	101	544	369	(443)	(81)	174	47
Advisory	485	491	244	(6)	(1)	247	101
Origination & Advisory	998	2,608	2,114	(1,610)	(62)	494	23
Other	84	(40)	99	124	N/M	(139)	N/M
Total net revenues	10,016	9,631	9,286	385	4	345	4
Provision for credit losses	319	104	690	215	N/M	(587)	(85)
Noninterest expenses							
Compensation and benefits	2,376	2,197	2,079	179	8	118	6
General and administrative expenses	3,805	3,587	3,325	218	6	262	8
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	15	47	14	(32)	(68)	33	N/M
Total noninterest expenses	6,196	5,831	5,418	365	6	413	8
Noncontrolling interests	15	(17)	11	32	N/M	(29)	N/M
Profit (loss) before tax	3,487	3,714	3,166	(227)	(6)	547	17
Total assets (in € bn.) ¹	677	616	574	61	10	42	7
Loans (gross of allowance for loan losses, in € bn.)	103	93	69	10	11	24	34
Total employees (directly-managed, full-time equivalent)	7,657	7,152	7,492	505	7	(341)	(5)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances.

Private Bank

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues:							
Private Bank Germany	5,327	5,008	4,989	319	6	19	0
International Private Bank	3,828	3,226	3,136	601	19	90	3
Premium Banking	953	945	905	8	1	41	4
Wealth Management & Bank for Entrepreneurs	2,874	2,281	2,232	594	26	49	2
Total net revenues	9,155	8,234	8,126	921	11	109	1
of which:							
Net interest income	5,223	4,601	4,499	622	14	102	2
Commissions and fee income	3,157	3,207	3,052	(50)	(2)	155	5
Remaining income	775	426	574	349	82	(148)	(26)
Provision for credit losses	583	446	711	137	31	(265)	(37)
Noninterest expenses:							
Compensation and benefits	2,791	2,813	2,867	(22)	(1)	(54)	(2)
General and administrative expenses	3,915	4,447	4,242	(533)	(12)	205	5
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	(113)	173	413	(285)	N/M	(240)	(58)
Total noninterest expenses	6,593	7,433	7,522	(840)	(11)	(89)	(1)
Noncontrolling interests	0	0	0	0	N/M	(0)	(87)
Profit (loss) before tax	1,979	355	(108)	1,624	N/M	463	N/M
Total assets (in € bn.) ¹	333	310	297	22	7	14	5
Loans (gross of allowance for loan losses, in € bn.)	265	254	237	10	4	17	7
Assets under management (in € bn.) ²	518	554	495	(36)	(6)	59	12
Net flows (in € bn.)	30	30	16	(0)	(1)	14	85
Total employees (directly-managed, full-time equivalent)	26,951	28,084	29,748	(1,132)	(4)	(1,665)	(6)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances.

² The Group defines assets under management as (a) assets held on behalf of customers for investment purposes and/or (b) client assets that are managed by the bank; assets under management are managed on a discretionary or advisory basis, or these assets are deposited with the bank; deposits are considered assets under management if they serve investment purposes; in the Private Bank Germany and Premium Banking, this includes term deposits and savings deposits; in Wealth Management & Bank for Entrepreneurs, it is assumed that all customer deposits are held with the bank primarily for investment purposes.

Asset Management

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Net revenues							
Management fees	2,458	2,370	2,136	88	4	233	11
Performance and transaction fees	125	212	90	(86)	(41)	122	135
Other	24	126	3	(102)	(81)	123	N/M
Total net revenues	2,608	2,708	2,229	(100)	(4)	478	21
Provision for credit losses	(2)	5	2	(6)	N/M	3	148
Noninterest expenses							
Compensation and benefits	899	822	740	77	9	82	11
General and administrative expenses	869	840	763	29	3	77	10
Impairment of goodwill and other intangible assets	68	0	0	68	N/M	(0)	N/M
Restructuring activities	0	2	22	(2)	(95)	(20)	(92)
Total noninterest expenses	1,836	1,664	1,526	173	10	138	9
Noncontrolling interests	174	223	157	(49)	(22)	66	42
Profit (loss) before tax	598	816	544	(217)	(27)	272	50
Total assets (in € bn.) ¹	10	10	9	(0)	(2)	1	10
Assets under management (in € bn.)	821	928	793	(106)	(11)	135	17
Net flows (in € bn.)	(20)	48	30	(68)	N/M	17	N/M
Total employees (directly-managed, full-time equivalent)	4,283	4,072	3,926	211	5	146	4

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances.

Capital Release Unit

				2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
in € m. (unless stated otherwise)	2022	2021	2020	in € m.	in %	in € m.	in %
Net revenues	(28)	26	(225)	(54)	N/M	251	N/M
Provision for credit losses	(17)	(42)	29	25	(59)	(70)	N/M
Noninterest expenses							
Compensation and benefits	60	128	168	(68)	(53)	(40)	(24)
General and administrative expenses	864	1,306	1,774	(442)	(34)	(468)	(26)
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	(2)	(2)	5	0	(21)	(7)	N/M
Total noninterest expenses	922	1,432	1,947	(510)	(36)	(515)	(26)
Noncontrolling interests	–	0	(0)	0	N/M	0	N/M
Profit (loss) before tax	(932)	(1,364)	(2,200)	431	(32)	836	(38)
Total assets (in € bn.) ¹	62	132	198	(70)	(53)	(66)	(33)
Total employees (directly-managed, full-time equivalent)	194	267	472	(73)	(27)	(205)	(43)

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

¹ Segment assets represent consolidated view, i.e. the amounts do not include intersegment balances.

Corporate & Other

				2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
in € m. (unless stated otherwise)	2022	2021	2020	in € m.	in %	in € m.	in %
Net revenues	(1,024)	(212)	(552)	(812)	N/M	340	(62)
Provision for credit losses	8	5	(4)	3	53	9	N/M
Noninterest expenses							
Compensation and benefits	3,165	3,012	3,215	153	5	(204)	(6)
General and administrative expenses	(2,272)	(2,009)	(2,651)	(263)	13	641	(24)
Impairment of goodwill and other intangible assets	0	0	0	0	N/M	0	N/M
Restructuring activities	0	(0)	3	0	N/M	(3)	N/M
Total noninterest expenses	893	1,002	568	(109)	(11)	435	77
Noncontrolling interests	(190)	(206)	(169)	16	(8)	(37)	22
Profit (loss) before tax	(1,736)	(1,014)	(947)	(722)	71	(67)	7
Employees (full-time equivalent)	31,865	30,103	29,627	1,762	6	476	2

N/M – Not meaningful

Prior year's comparatives aligned to presentation in the current year.

Entity-wide disclosures

The Group's entity-wide Disclosures include net revenues from internal and external counterparties. Excluding revenues from internal counterparties would require disproportionate IT investment and is not in line with the Bank's management approach. For details of the net revenue components please see "Management Report: Operating and Financial Review: Results of Operations: Corporate Divisions".

The following table presents total net revenues (before provisions for credit losses) by geographic area for the years ended December 31, 2022, 2021 and 2020, respectively. The information presented for Corporate Bank, Investment Bank, Private Bank, Asset Management and Capital Release Unit has been classified based primarily on the location of the Group's office in which the revenues are recorded. The information for Corporate & Other is presented on a global level only, as management responsibility for Corporate & Other is held centrally.

in € m.	2022	2021	2020
Germany:			
Corporate Bank	3,164	2,593	2,538
Investment Bank	587	450	431
Private Bank	5,878	5,481	5,456
Asset Management	1,266	1,385	992
Capital Release Unit	7	4	23
Total Germany	10,902	9,914	9,441
UK:			
Corporate Bank	143	144	110
Investment Bank	4,343	3,642	3,552
Private Bank	3	(2)	31
Asset Management	356	336	292
Capital Release Unit	14	(122)	(383)
Total UK	4,858	3,997	3,602
Rest of Europe, Middle East and Africa:			
Corporate Bank	1,162	900	934
Investment Bank	383	255	358
Private Bank	2,191	1,783	1,682
Asset Management	275	286	344
Capital Release Unit	13	26	35
Total Rest of Europe, Middle East and Africa	4,024	3,249	3,355
Americas (primarily United States):			
Corporate Bank	974	750	768
Investment Bank	3,033	3,904	3,285
Private Bank	466	364	362
Asset Management	580	537	465
Capital Release Unit	(55)	41	50
Total Americas	4,998	5,596	4,929
Asia/Pacific:			
Corporate Bank	892	764	796
Investment Bank	1,671	1,381	1,660
Private Bank	617	608	594
Asset Management	131	163	136
Capital Release Unit	(6)	77	49
Total Asia/Pacific	3,305	2,993	3,236
Corporate & Other	(1,024)	(212)	(552)
Consolidated net revenues¹	27,063	25,538	24,011

¹ Consolidated net revenues comprise interest and similar income, interest expenses and total noninterest income (including net commission and fee income); revenues are attributed to countries based on the location in which the Group's booking office is located; the location of a transaction on the Group's books is sometimes different from the location of the headquarters or other offices of a customer and different from the location of the Group's personnel who entered into or facilitated the transaction; where the Group records a transaction involving its staff and customers and other third parties in different locations frequently depends on other considerations, such as the nature of the transaction, regulatory considerations and transaction processing considerations.

Notes to the consolidated income statement

05 – Net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss

Net interest income

in € m.	2022	2021	2020
Interest and similar income:			
Interest income on cash and central bank balances	1,936	160	321
Interest income on interbank balances (w/o central banks)	352	67	325
Central bank funds sold and securities purchased under resale agreements	504	273	318
Loans	14,238	10,650	11,586
Other	1,969	1,747	896
Total Interest and similar income from assets measured at amortized cost	18,999	12,897	13,446
Interest income on financial assets at fair value through other comprehensive income	798	501	635
Total interest and similar income calculated using the effective interest method	19,798	13,399	14,081
Financial assets at fair value through profit or loss	4,652	3,374	3,873
Total interest and similar income	24,449	16,773	17,954
Thereof: negative interest expense on financial liabilities	959	1,217	636
Interest expense:			
Interest-bearing deposits	3,719	1,456	2,065
Central bank funds purchased and securities sold under repurchase agreements	304	148	169
Other short-term borrowings	111	71	62
Long-term debt	2,409	1,484	1,612
Trust preferred securities	13	3	42
Other	1,119	876	807
Total interest expense measured at amortized cost	7,676	4,036	4,758
Financial liabilities at fair value through profit or loss	2,791	1,619	1,648
Total interest expense	10,466	5,655	6,405
Thereof: negative interest income on financial assets	461	786	582
Net interest income	13,983	11,117	11,548

Other interest income for the year ended December 31, 2022, 2021 and 2020 included € 0 million, € 0 million, € 43 million respectively, which were related to government grants under the Targeted Longer-term Refinancing Operations II (TLTRO II)-program.

Impact of ECB Targeted Longer-term Refinancing Operations (TLTRO III program)

The Governing Council of the ECB decided on a number of modifications to the terms and conditions of its TLTRO III - refinancing program in order to support funding of credit to households and firms and the current economic disruption.

The base interest rate under the TLTRO III-refinancing program is the average of the main refinancing operations rate with the exception of the period from June 24, 2020 to June 23, 2022, when a discount of 50 basis points applies ("base rate discount"). The applicable interest rate under the TLTRO III-refinancing program can further reduce by "new lending discounts" that apply if certain net lending thresholds are met. Accordingly, banks whose eligible net lending exceeds 0 % between March 1, 2020 and March 31, 2021 pay a rate 0.5 % lower than the average deposit facility rate for borrowings between June 24, 2020 and June 23, 2021. The interest rate outside of the period from June 24, 2020 to June 23, 2021 will be the average interest rate on the deposit facility with exception of the period from June 24, 2021 to June 23, 2022 when banks pay a rate 0.5 % lower than the average deposit facility rate for borrowings provided their eligible net lending exceeds 0 % between October 1, 2020 and December 31, 2021. On October 27, 2022 the ECB announced a change to interest calculation. Accordingly, the existing interest rate calculation equal to the average deposit facility rate ceased on November 22, 2022. From November 23, 2022, interest rate on all remaining TLTRO III operations is indexed on the average applicable key ECB interest rates from that date onward.

The Group considers the initial benefits that arise from borrowing under TLTRO III as government grant from a below-market loan under IAS 20 and recognizes subsequent benefits in accordance IFRS 9. The bank's accounting policy for government grants is detailed in the "Significant accounting policies and critical accounting estimates" section of this report.

As of December 31, 2022, the Group has borrowed € 33.7 billion (December 31, 2021: € 44.7 billion) under the TLTRO III-refinancing program. The resulting net interest income includes € 211 million for the 12 months ended December 31, 2022 (December 31, 2021: € 494 million) under the TLTRO III program.

Net gains (losses) on financial assets/liabilities at fair value through profit or loss

in € m.	2022	2021	2020
Trading income (loss):			
FIC Sales and Trading	5,353	2,780	3,457
Other trading income (loss)	(2,608)	(827)	(1,360)
Total trading income (loss)	2,745	1,954	2,097
Net gains (losses) on non-trading financial assets mandatory at fair value through profit or loss:			
Breakdown by financial assets category:			
Debt Securities	(43)	95	5
Equity Securities	47	812	114
Loans and loan commitments	(5)	18	(38)
Deposits	14	2	(9)
Others non-trading financial assets mandatory at fair value through profit and loss	(73)	180	203
Total net gains (losses) on non-trading financial assets mandatory at fair value through profit or loss:	(61)	1,106	276
Net gains (losses) on financial assets/liabilities designated at fair value through profit or loss:			
Breakdown by financial asset/liability category:			
Loans and loan commitments	(2)	11	15
Deposits	4	5	(1)
Long-term debt	265	48	(71)
Other financial assets/liabilities designated at fair value through profit or loss	11	15	16
Total net gains (losses) on financial assets/liabilities designated at fair value through profit or loss	277	79	(40)
Total net gains (losses) on financial assets/liabilities at fair value through profit or loss	2,962	3,139	2,332

Combined net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss

in € m.	2022	2021	2020
Net interest income	13,983	11,117	11,548
Trading income (loss) ¹	2,745	1,954	2,097
Net gains (losses) on non-trading financial assets mandatory at fair value through profit or loss	(61)	1,106	276
Net gains (losses) on financial assets/liabilities designated at fair value through profit or loss	277	79	(40)
Total net gains (losses) on financial assets/liabilities at fair value through profit or loss	2,962	3,139	2,332
Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss²	16,945	14,256	13,880
Corporate Treasury Services	2,503	1,812	2,071
Institutional Client Services	572	328	313
Business Banking	645	526	555
Corporate Bank	3,720	2,666	2,939
FIC Sales & Trading	8,697	6,917	6,991
Remaining Products	(432)	(26)	202
Investment Bank	8,265	6,891	7,193
Private Bank Germany	4,619	3,114	2,956
International Private Bank	1,993	1,733	1,693
Private Bank	6,612	4,847	4,648
Asset Management	(250)	246	(98)
Capital Release Unit	(61)	(18)	(33)
Corporate & Other	(1,342)	(375)	(768)
Total net interest income and net gains (losses) on financial assets/liabilities at fair value through profit or loss	16,945	14,256	13,880

¹ Trading income (loss) includes gains and losses from derivatives not qualifying for hedge accounting.

² Prior year segmental information presented in the current structure.

The Group's trading and risk management businesses include significant activities in interest rate instruments and related derivatives. Under IFRS, interest and similar income earned from trading instruments and financial instruments designated at fair value through profit or loss (i.e., coupon and dividend income), and the costs of funding net trading positions, are part of net interest income. The Group's trading activities can periodically shift income to either net interest income or to net gains (losses) of financial assets/liabilities at fair value through profit or loss depending on a variety of factors, including risk management strategies. The above table combines net interest income and net gains (losses) of financial assets/liabilities at fair value through profit or loss by business division.

06 – Commissions and fee income

in € m.

	2022	2021	2020
Commission and fee income and expense:			
Commission and fee income	12,512	13,730	12,044
Commission and fee expense	2,675	2,796	2,620
Net commissions and fee income	9,838	10,934	9,424

Disaggregation of revenues by product type and business segment

	Dec 31, 2022						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Major type of services:							
Commissions for administration	218	33	254	17	0	(3)	520
Commissions for assets under management	18	1	363	3,642	(0)	0	4,024
Commissions for other securities	512	(0)	47	0	0	0	559
Underwriting and advisory fees	35	1,373	12	0	0	(52)	1,368
Brokerage fees	19	253	1,164	65	(1)	0	1,501
Commissions for local payments	479	3	1,006	0	0	8	1,497
Commissions for foreign commercial business	466	33	62	0	0	(5)	556
Commissions for foreign currency/exchange business	15	0	5	0	0	(0)	19
Commissions for loan processing and guarantees	618	298	292	0	3	2	1,213
Intermediary fees	23	2	523	0	0	13	562
Fees for sundry other customer services	282	277	10	122	3	1	695
Total fee and commissions income	2,684	2,273	3,739	3,847	6	(36)	12,512
Gross expense							(2,675)
Net fees and commissions							9,838

							Dec 31, 2021
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Major type of services:							
Commissions for administration	231	27	259	21	4	(2)	539
Commissions for assets under management	16	1	369	3,570	(0)	0	3,956
Commissions for other securities	423	(0)	43	1	0	0	467
Underwriting and advisory fees	35	2,258	12	0	(0)	(41)	2,264
Brokerage fees	22	246	1,302	96	118	(0)	1,784
Commissions for local payments	441	4	864	0	0	10	1,320
Commissions for foreign commercial business	456	23	95	0	(0)	(2)	572
Commissions for foreign currency/exchange business	11	0	5	0	0	(0)	16
Commissions for loan processing and guarantees	564	279	305	0	5	5	1,157
Intermediary fees	12	3	617	0	0	11	644
Fees for sundry other customer services	282	562	40	121	4	2	1,011
Total fee and commissions income	2,494	3,403	3,910	3,809	132	(18)	13,730
Gross expense							(2,796)
Net fees and commissions							10,934

							Dec 31, 2020
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total Consolidated
Major type of services:							
Commissions for administration	245	17	235	23	1	(3)	518
Commissions for assets under management	19	1	319	3,090	(0)	0	3,429
Commissions for other securities	365	0	35	0	0	0	401
Underwriting and advisory fees	29	1,688	13	0	1	(42)	1,688
Brokerage fees	21	357	1,103	72	113	(1)	1,665
Commissions for local payments	436	(2)	951	(0)	0	8	1,394
Commissions for foreign commercial business	409	25	104	0	0	(3)	536
Commissions for foreign currency/exchange business	4	0	6	0	0	(0)	11
Commissions for loan processing and guarantees	529	210	305	0	7	7	1,058
Intermediary fees	9	2	579	1	1	12	604
Fees for sundry other customer services	276	289	39	131	4	1	741
Total fee and commissions income	2,344	2,588	3,689	3,317	127	(20)	12,044
Gross expense							(2,620)
Net fees and commissions							9,424

Fee and commission income and gross expense have been restated by € 182 million for 2020. The reclassifications did not affect net fee and commission income.

Revenue is recognized when performance obligations are satisfied. Performance obligation is satisfied by fund performance exceeding a hurdle rate (an agreed minimum annual return provided to investors). As of 31 December 2022, there were performance obligations to be satisfied of € 267 million with a time band of three years from 2024 to 2026 (as of 31 December 2021, € 244 million with a time band of five years from 2023 to 2027) from alternative funds. The increase of performance obligations to be satisfied was mainly driven by fund valuations and asset sales.

As of December 31, 2022, and December 31, 2021, the Group's balance of receivables from commission and fee income was € 798 million and € 834 million respectively. As of December 31, 2022, and December 31, 2021, the Group's balance of contract liabilities associated to commission and fee income was € 63 million and € 70 million, respectively. Contract liabilities arise from the Group's obligation to provide future services to a customer for which it has received consideration from the customer prior to completion of the services. The balances of receivables and contract liabilities do not vary significantly from period to period reflecting the fact that they predominately relate to recurring service contracts with service periods of less than one year such as monthly current account services and quarterly asset management services. As a result, prior period balances of contract liabilities are generally recognized in revenue in the subsequent period. Customer payment in exchange for services provided are generally subject to performance by the Group over the specific service period such that the Group's right to payment arises at the end of the service period when its performance obligations are fully completed. Therefore, no material balance of contract asset is reported.

07 – Net gains (losses) from derecognition of financial assets measured at amortized cost

For the twelve months ended December 31, 2022, the Group sold financial assets measured at amortized cost of € 473 million (December 31, 2021: € 539 million and December 31, 2020: € 10 billion). The sales in the comparative period 2020 related primarily to a Hold to Collect (HTC) portfolio in Postbank as well as sales made from a HTC portfolio in Treasury. A decision was made to divest the Postbank bond portfolio as part of the integration of Postbank into the Group. The Treasury sales were made as part of a strategy realignment for managing the interest rate risk in the banking book. As a result of these sales, the HTC business model is no longer valid for future acquisitions of assets in this portfolio.

The table below presents the gains and (losses) arising from derecognition of these securities.

in € m.	2022	2021	2020
Gains	11	15	344
Losses	(13)	(15)	(33)
Net gains (losses) from derecognition of financial assets measured at amortized cost	(2)	1	311

08 – Other income (loss)

in € m.	2022	2021	2020
Other income (loss):			
Insurance premiums	3	3	3
Net income (loss) from hedge relationships qualifying for hedge accounting	(594)	195	(214)
Remaining other income (loss) ¹	937	(185)	162
Total other income (loss)	346	13	(48)

¹ Includes net gains (losses) of € 404 million, € 10 million and € (59) million for the years ended December 31, 2022, 2021 and 2020, respectively, that are related to non-current assets and disposal groups held for sale.

09 – General and administrative expenses

in € m.	2022	2021	2020
General and administrative expenses:			
Information Technology	3,680	4,321	3,862
Occupancy, furniture and equipment expenses	1,429	1,727	1,724
Regulatory, Tax & Insurance ¹	1,285	1,395	1,407
Professional services	858	924	977
Banking Services and outsourced operations	881	946	967
Market Data and Research Services	378	347	376
Travel expenses	110	46	76
Marketing expenses	165	178	174
Other expenses ²	943	938	697
Total general and administrative expenses	9,728	10,821	10,259

¹ Includes bank levy of € 762 million in 2022, € 553 million in 2021 and € 633 million in 2020.

² Includes litigation related expenses of € 413 million in 2022, € 466 million in 2021 and € 158 million in 2020. See Note 27 "Provisions", for more details on litigation.

10 – Restructuring

Restructuring is primarily driven by the implementation of the Group's strategic changes as announced in the third quarter 2019. The Group has defined and implemented measures that aimed to strengthen the bank, position it for growth and simplify its organizational set-up. The measures also aimed to reduce adjusted costs through higher efficiency, by optimizing and streamlining processes, and by exploiting synergies.

Restructuring expense is comprised of termination benefits, additional expenses covering the acceleration of deferred compensation awards not yet amortized due to the discontinuation of employment and contract termination costs related to real estate.

In 2022, the Group reached a significant milestone in the strategic transformation announced in July 2019, many of the restructuring programs were concluded and the underlying assumptions for the remaining restructuring provisions were reviewed resulting in a partial release of provisions. Overall in 2022, the Group recognized a credit of € 118 million in the Consolidated Statement of Income.

Net restructuring expense by division

in € m.	2022	2021	2020
Corporate Bank	(19)	42	28
Investment Bank	15	47	14
Private Bank	(113)	173	413
Asset Management	0	2	22
Capital Release Unit	(2)	(2)	5
Corporate & Other	0	(0)	3
Total Net Restructuring Charges	(118)	261	485

Net restructuring by type

in € m.	2022	2021	2020
Restructuring – Staff related	(117)	241	479
thereof:			
Termination Benefits	(132)	224	441
Retention Acceleration	15	16	36
Social Security	0	1	1
Restructuring – Non Staff related	(1)	21	6
Total Net Restructuring Charges	(118)	261	485

Provisions for restructuring amounted to € 248 million, € 582 million and € 676 million as of December 31, 2022, December 31, 2021 and December 31, 2020, respectively. The majority of the current provisions for restructuring are expected to be utilized in the next year.

During 2022, 903 full-time equivalent staff was reduced through restructuring (2021: 1,362 and 2020: 1,447).

Organizational changes

Full-time equivalent staff	2022	2021	2020
Corporate Bank	113	228	303
Investment Bank	54	149	100
Private Bank	594	776	630
Asset Management	1	10	48
Capital Release Unit	0	13	69
Infrastructure	141	186	297
Total full-time equivalent staff	903	1,362	1,447

11 – Earnings per share

Basic earnings per share amounts are computed by dividing net income (loss) attributable to Deutsche Bank shareholders by the average number of common shares outstanding during the year. The average number of common shares outstanding is defined as the average number of common shares issued, reduced by the average number of shares in treasury and by the average number of shares that will be acquired under physically-settled forward purchase contracts, and increased by undistributed vested shares awarded under deferred share plans.

Diluted earnings per share assumes the conversion into common shares of outstanding securities or other contracts to issue common stock, such as share options, convertible debt, unvested deferred share awards and forward contracts. The aforementioned instruments are only included in the calculation of diluted earnings per share if they are dilutive in the respective reporting period.

Computation of basic and diluted earnings per share

in € m.	2022	2021	2020
Net income (loss) attributable to Deutsche Bank shareholders and additional equity components	5,420	2,451	483
Coupons paid on additional equity components	(479)	(363)	(349)
Net income (loss) attributable to Deutsche Bank shareholders – numerator for basic earnings per share	4,940	2,088	135
Effect of dilutive securities	0	0	0
Net income (loss) attributable to Deutsche Bank shareholders after assumed conversions – numerator for diluted earnings per share	4,940	2,088	135
Number of shares in million			
Weighted-average shares outstanding – denominator for basic earnings per share	2,084.9	2,096.5	2,108.2
Effect of dilutive securities:			
Forwards	0.0	0.0	0.0
Employee stock compensation options	0.0	0.0	0.0
Deferred shares	40.7	46.6	62.0
Other (including trading options)	0.0	0.0	0.0
Dilutive potential common shares	0.0	0.0	0.0
Adjusted weighted-average shares after assumed conversions – denominator for diluted earnings per share	2,125.6	2,143.2	2,170.1

Earnings per share

in €	2022	2021	2020
Basic earnings per share	2.37	1.00	0.06
Diluted earnings per share	2.32	0.97	0.06

There were no instruments outstanding that could potentially dilute basic earnings per share and are not included in the calculation of diluted earnings per share as of December 31, 2022.

Notes to the consolidated balance sheet

12 – Financial assets/liabilities at fair value through profit or loss

in € m.	Dec 31, 2022	Dec 31, 2021
Financial assets classified as held for trading:		
Trading assets:		
Trading securities	84,012	92,536
Other trading assets ¹	8,855	9,860
Total trading assets	92,867	102,396
Positive market values from derivative financial instruments	299,856	299,732
Total financial assets classified as held for trading	392,722	402,128
Non-trading financial assets mandatory at fair value through profit or loss:		
Securities purchased under resale agreements	63,855	59,931
Securities borrowed	17,414	18,355
Loans	1,037	895
Other financial assets mandatory at fair value through profit or loss	7,348	9,784
Total Non-trading financial assets mandatory at fair value through profit or loss	89,654	88,965
Financial assets designated at fair value through profit or loss:		
Loans	168	139
Other financial assets designated at fair value through profit or loss	0	0
Total financial assets designated at fair value through profit or loss	168	140
Total financial assets at fair value through profit or loss	482,545	491,233

¹ Includes traded loans of € 8.0 billion and € 9.2 billion at December 31, 2022 and 2021 respectively.

in € m.	Dec 31, 2022	Dec 31, 2021
Financial liabilities classified as held for trading:		
Trading liabilities:		
Trading securities	49,860	54,235
Other trading liabilities	756	483
Total trading liabilities	50,616	54,718
Negative market values from derivative financial instruments	282,418	287,109
Total financial liabilities classified as held for trading	333,035	341,827
Financial liabilities designated at fair value through profit or loss:		
Securities sold under repurchase agreements	48,517	53,364
Loan commitments	12	7
Long-term debt	5,250	3,699
Other financial liabilities designated at fair value through profit or loss	856	1,397
Total financial liabilities designated at fair value through profit or loss	54,634	58,468
Investment contract liabilities	469	562
Total financial liabilities at fair value through profit or loss	388,138	400,857

Financial assets & liabilities designated at fair value through profit or loss

The Group has designated various lending relationships at fair value through profit or loss. Lending facilities consist of drawn loan assets and undrawn irrevocable loan commitments. The maximum exposure to credit risk on a drawn loan is its fair value. The Group's maximum exposure to credit risk on drawn loans was € 168 million and € 139 million as of December 31, 2022, and 2021, respectively. Exposure to credit risk also exists for undrawn irrevocable loan commitments and is predominantly counterparty credit risk.

The credit risk on the securities purchased under resale agreements and securities borrowed designated under the fair value option is mitigated by the holding of collateral. The valuation of these instruments takes into account the credit enhancement in the form of the collateral received. As such there is no material movement during the year or cumulatively due to movements in counterparty credit risk on these instruments.

Changes in fair value of financial assets attributable to movements in counterparty credit risk

in € m.	Dec 31, 2022	Dec 31, 2021
Notional value of financial assets exposed to credit risk	168	136
Annual change in the fair value reflected in the Statement of Income	0	1
Cumulative change in the fair value	1	0
Notional of credit derivatives used to mitigate credit risk	90	98
Annual change in the fair value reflected in the Statement of Income	0	0
Cumulative change in the fair value	0	0

Changes in fair value of financial liabilities attributable to movements in the Group's credit risk¹

in € m.	Dec 31, 2022	Dec 31, 2021
Presented in Other comprehensive Income		
Cumulative change in the fair value	77	7
Presented in Statement of income		
Annual change in the fair value reflected in the Statement of Income	0	0
Cumulative change in the fair value	0	0

¹ The fair value of a financial liability incorporates the credit risk of that financial liability. Changes in the fair value of financial liabilities issued by consolidated structured entities have been excluded as this is not related to the Group's credit risk but to that of the legally isolated structured entity, which is dependent on the collateral it holds.

Transfers of the cumulative gains or losses within equity during the period

in € m.	Dec 31, 2022	Dec 31, 2021
Cumulative gains or losses within equity during the period	0	0

Amounts realized on derecognition of liabilities designated at fair value through profit or loss

in € m.	Dec 31, 2022	Dec 31, 2021
Amount presented in other comprehensive income realized at derecognition	0	0

The excess of the contractual amount repayable at maturity over the carrying value of financial liabilities¹

in € m.	Dec 31, 2022	Dec 31, 2021
Including undrawn loan commitments ²	3,308	2,943
Excluding undrawn loan commitments	892	607

¹ Assuming the liability is extinguished at the earliest contractual maturity that the Group can be required to repay. When the amount payable is not fixed, it is determined by reference to conditions existing at the reporting date.

² The contractual cash flows at maturity for undrawn loan commitments assume full drawdown of the facility.

13 – Financial Instruments carried at Fair Value

Valuation Methods and Control

The Group has an established valuation control framework which governs internal control standards, methodologies, and procedures over the valuation process.

Prices Quoted in Active Markets – The fair value of instruments that are quoted in active markets are determined using the quoted prices where they represent prices at which regularly and recently occurring transactions take place.

Valuation Techniques – The Group uses valuation techniques to establish the fair value of instruments where prices, quoted in active markets, are not available. Valuation techniques used for financial instruments include modelling techniques, the use of indicative quotes for proxy instruments, quotes from recent and less regular transactions and broker quotes.

For some financial instruments a rate or other parameter, rather than a price, is quoted. Where this is the case then the market rate or parameter is used as an input to a valuation model to determine fair value. For some instruments, modelling techniques follow industry standard models, for example, discounted cash flow analysis and standard option pricing models. These models are dependent upon estimated future cash flows, discount factors and volatility levels. For more complex or unique instruments, more sophisticated modelling techniques are required, and may rely upon assumptions or more complex parameters such as correlations, prepayment speeds, default rates and loss severity.

Frequently, valuation models require multiple parameter inputs. Where possible, parameter inputs are based on observable data or are derived from the prices of relevant instruments traded in active markets. Where observable data is not available for parameter inputs, then other market information is considered. For example, indicative broker quotes and consensus pricing information are used to support parameter inputs where they are available. Where no observable information is available to support parameter inputs then they are based on other relevant sources of information such as prices for similar transactions, historic data, economic fundamentals, and research information, with appropriate adjustment to reflect the terms of the actual instrument being valued and current market conditions.

Valuation Adjustments – Valuation adjustments are an integral part of the valuation process. In making appropriate valuation adjustments, the Group follows methodologies that consider factors such as bid-offer spreads, counterparty/own credit and funding risk. Bid-offer spread valuation adjustments are required to adjust mid-market valuations to the appropriate bid or offer valuation. The bid or offer valuation is the best representation of the fair value for an instrument, and therefore its fair value. The carrying value of a long position is adjusted from mid to bid, and the carrying value of a short position is adjusted from mid to offer. Bid-offer valuation adjustments are determined from bid-offer prices observed in relevant trading activity and in quotes from other broker-dealers or other knowledgeable counterparties. Where the quoted price for the instrument is already a bid-offer price then no additional bid-offer valuation adjustment is necessary. Where the fair value of financial instruments is derived from a modelling technique, then the parameter inputs into that model are normally at a mid-market level. Such instruments are generally managed on a portfolio basis and, when specified criteria are met, valuation adjustments are taken to reflect the cost of closing out the net exposure the Bank has to individual market or counterparty risks. These adjustments are determined from bid-offer prices observed in relevant trading activity and quotes from other broker-dealers.

Where complex valuation models are used, or where less-liquid positions are being valued, then bid-offer levels for those positions may not be available directly from the market, and therefore for the close-out cost of these positions, models and parameters must be estimated. When these adjustments are designed, the Group closely examines the valuation risks associated with the model as well as the positions themselves, and the resulting adjustments are closely monitored on an ongoing basis.

Counterparty Credit Valuation Adjustments (CVAs) are required to cover expected credit losses to the extent that the valuation technique does not already include an expected credit loss factor relating to the non-performance risk of the counterparty. The CVA amount is applied to all relevant over-the-counter (OTC) derivatives, and is determined by assessing the potential credit exposure to a given counterparty and taking into account any collateral held, the effect of any relevant netting arrangements, expected loss given default and the probability of default, based on available market information, including Credit Default Swap (CDS) spreads. Where counterparty CDS spreads are not available, relevant proxies are used.

The fair value of the Group's financial liabilities at fair value through profit or loss (i.e., OTC derivative liabilities and issued note liabilities designated at fair value through profit or loss) incorporates valuation adjustments to measure the change in the Group's own credit risk (i.e. Debt Valuation Adjustments (DVA) for Derivatives and Own Credit Adjustment (OCA) for structured notes). For derivative liabilities the Group considers its own creditworthiness by assessing all counterparties' expected future exposure to the Group, taking into account any collateral posted by the Group, the effect of relevant netting arrangements, the probability of default of the Group, based on the Group's market CDS level and the expected loss given default, taking into account the seniority of derivative claims under resolution (statutory subordination). Issued note liabilities are discounted

utilizing the spread at which similar instruments would be issued or bought back at the measurement date as this reflects the value from the perspective of a market participant who holds the identical item as an asset. Under IFRS 9 the change in the own credit component is reported under Other Comprehensive Income (OCI).

In the third quarter of 2022, the Group implemented refinements to its methodology for the own credit adjustment calculation. The refinement means all of the spread above the benchmark rate is now regarded as own credit. Previously, the spread was split into a market level of funding component (recognition as a gain or loss in the Group's Consolidated Statement of Income) and an idiosyncratic own credit component (taken through Other Comprehensive Income). The impact from this change in estimate in the third quarter of 2022 was a loss of € 55 million before tax recognized in the Group's Consolidated Statement of Income and a corresponding increase in the Group's Consolidated Statement of Comprehensive Income. The revised approach is expected to result in a more consistent own credit valuation with peer banks.

When determining CVA and DVA, additional adjustments are made where appropriate to achieve fair value, due to the expected loss estimate of a particular arrangement, or where the credit risk being assessed differs in nature to that described by the available CDS instrument.

Funding Valuation Adjustments (FVA) are required to incorporate the market implied funding costs into the fair value of derivative positions. The FVA reflects a discounting spread applied to uncollateralized and partially collateralized derivatives and is determined by assessing the market-implied funding costs on both assets and liabilities.

Where there is uncertainty in the assumptions used within a modelling technique, an additional adjustment is taken to calibrate the model price to the expected market price of the financial instrument. Typically, such transactions have bid-offer levels which are less observable, and these adjustments aim to estimate the bid-offer by computing the liquidity-premium associated with the transaction. Where a financial instrument is of sufficient complexity that the cost of closing it out would be higher than the cost of closing out its component risks, then an additional adjustment is taken to reflect this.

IFRS requires the Group to use the assumptions that market participants would use when pricing the asset or liability. Where relevant, these assumptions may include assumptions about climate change. The Group has not made material adjustment to fair value for climate change beyond that already priced into market inputs.

Valuation Control – The Group has an independent specialized valuation control group within the Risk function which governs and develops the valuation control framework and manages the valuation control processes. The mandate of this specialist function includes the performance of the independent valuation control process for all businesses, the continued development of valuation control methodologies and techniques, as well as devising and governing the formal valuation control policy framework. Special attention of this independent valuation control group is directed to areas where management judgment forms part of the valuation process.

Results of the valuation control process are collected and analyzed as part of a standard monthly reporting cycle. Variances of differences outside of preset and approved tolerance levels are escalated both within the Finance function and with Senior Business Management for review, resolution and, if required, adjustment.

For instruments where fair value is determined from valuation models, the assumptions and techniques used within the models are independently validated by an independent specialist model validation group that is part of the Group's Risk Management function.

Quotes for transactions and parameter inputs are obtained from a number of third party sources including exchanges, pricing service providers, firm broker quotes and consensus pricing services. Price sources are examined and assessed to determine the quality of fair value information they represent, with greater emphasis given to those possessing greater valuation certainty and relevance. The results are compared against actual transactions in the market to ensure the model valuations are calibrated to market prices.

Price and parameter inputs to models, assumptions and valuation adjustments are verified against independent sources. Where they cannot be verified to independent sources due to lack of observable information, the estimate of fair value is subject to procedures to assess its reasonableness. Such procedures include performing revaluation using independently generated models (including where existing models are independently recalibrated), assessing the valuations against appropriate proxy instruments and other benchmarks, and performing extrapolation techniques. Assessment is made as to whether the valuation techniques produce fair value estimates that are reflective of market levels by calibrating the results of the valuation models against market transactions where possible.

Fair Value Hierarchy

The financial instruments carried at fair value have been categorized under the three levels of the IFRS fair value hierarchy as follows:

Level 1 – Instruments valued using quoted prices in active markets are instruments where the fair value can be determined directly from prices which are quoted in active, liquid markets and where the instrument observed in the market is representative of that being priced in the Group's inventory.

These include: government bonds, exchange-traded derivatives and equity securities traded on active, liquid exchanges.

Level 2 – Instruments valued with valuation techniques using observable market data are instruments where the fair value can be determined by reference to similar instruments trading in active markets, or where a technique is used to derive the valuation but where all inputs to that technique are observable.

These include: many OTC derivatives; many investment-grade listed credit bonds; some CDS; many collateralized debt obligations (CDO); and many less-liquid equities.

Level 3 – Instruments valued using valuation techniques using market data which is not directly observable are instruments where the fair value cannot be determined directly by reference to market-observable information, and some other pricing technique must be employed. Instruments classified in this category have an element which is unobservable and which has a significant impact on the fair value.

These include: more-complex OTC derivatives; distressed debt; highly-structured bonds; illiquid asset-backed securities (ABS); illiquid CDO's (cash and synthetic); some private equity placements; many commercial real estate (CRE) loans; illiquid loans; and some municipal bonds.

Carrying value of the financial instruments held at fair value¹

in € m.	Dec 31, 2022			Dec 31, 2021		
	Quoted prices in active market (Level 1)	Valuation technique observable parameters (Level 2)	Valuation technique unobservable parameters (Level 3)	Quoted prices in active market (Level 1)	Valuation technique observable parameters (Level 2)	Valuation technique unobservable parameters (Level 3)
Financial assets held at fair value:						
Trading assets	42,035	42,285	8,547	51,020	42,561	8,815
Trading securities	41,826	39,133	3,053	50,814	38,108	3,614
Other trading assets	209	3,152	5,494	206	4,453	5,201
Positive market values from derivative financial instruments	4,937	285,355	9,564	4,354	286,337	9,042
Non-trading financial assets mandatory at fair value through profit or loss	1,605	82,259	5,790	2,764	81,304	4,896
Financial assets designated at fair value through profit or loss	0	75	94	0	91	49
Financial assets at fair value through other comprehensive income	15,892	13,108	2,676	13,375	13,302	2,302
Other financial assets at fair value	1,684	(440) ²	5	98	928 ²	78
Total financial assets held at fair value	66,153	422,640	26,675	71,611	424,524	25,182
Financial liabilities held at fair value:						
Trading liabilities	43,163	7,419	34	48,364	6,272	83
Trading securities	43,162	6,667	30	48,363	5,838	33
Other trading liabilities	2	752	3	0	434	49
Negative market values from derivative financial instruments	3,256	270,662	8,500	5,208	272,121	9,781
Financial liabilities designated at fair value through profit or loss	0	51,843	2,792	0	56,728	1,740
Investment contract liabilities	0	469	0	0	562	0
Other financial liabilities at fair value	240	1,687 ²	(511) ³	5	3,025 ²	(179) ³
Total financial liabilities held at fair value	46,660	332,080	10,815	53,576	338,707	11,424

¹ Amounts in this table are generally presented on a gross basis, in line with the Group's accounting policy regarding offsetting of financial instruments, as described in Note 1 "Significant Accounting Policies and Critical Accounting Estimates".

² Predominantly relates to derivatives qualifying for hedge accounting.

³ Relates to derivatives which are embedded in contracts where the host contract is held at amortized cost but for which the embedded derivative is separated. The separated embedded derivatives may have a positive or a negative fair value but have been presented in this table to be consistent with the classification of the host contract. The separated embedded derivatives are held at fair value on a recurring basis and have been split between the fair value hierarchy classifications.

Until December 31, 2022 there were transfers from Level 1 to Level 2 on trading securities (€ 1.0 billion of assets), non-trading financial assets mandatory at fair value through profit or loss (€ 770 million of assets) and there were transfers from Level 2 to Level 1 on trading securities (€ 700 million of assets). The assessment of level 1 versus level 2 is based on liquidity testing procedures.

Valuation Techniques

The Group has an established valuation control framework which governs internal control standards, methodologies, valuation techniques and procedures over the valuation process and fair value measurement. The global economic and geopolitical environment including the war in Russia continues to be characterized by determined inflation, rising interest rates and volatility in global financial markets, this required additional focus and review in certain areas, including assessment of bid-offer spreads to ensure they were representative of fair value.

The following is an explanation of the valuation techniques used in establishing the fair value of the different types of financial instruments that the Group trades.

Sovereign, Quasi-sovereign and Corporate Debt and Equity Securities – Where there are no recent transactions then fair value may be determined from the last market price adjusted for all changes in risks and information since that date. Where a close proxy instrument is quoted in an active market then fair value is determined by adjusting the proxy value for differences in the risk profile of the instruments. Where close proxies are not available then fair value is estimated using more complex modelling techniques. These techniques include discounted cash flow models using current market rates for credit, interest, liquidity and other risks. For equity securities modeling techniques may also include those based on earnings multiples.

Mortgage- and Other Asset-Backed Securities (MBS/ABS) include residential and commercial MBS and other ABS including CDOs. ABS have specific characteristics as they have different underlying assets and the issuing entities have different capital structures. The complexity increases further where the underlying assets are themselves ABS, as is the case with many of the CDO instruments.

Where no reliable external pricing is available, ABS are valued, where applicable, using either relative value analysis which is performed based on similar transactions observable in the market, or industry-standard valuation models making largest possible use of available observable inputs. The industry standard models calculate principal and interest payments for a given deal based on assumptions that can be independently price tested. The inputs include prepayment speeds, loss assumptions (timing and severity) and a discount rate (spread, yield or discount margin). These inputs/assumptions are derived from actual transactions, external market research and market indices where appropriate.

Loans – For certain loans fair value may be determined from the market price on a recently occurring transaction adjusted for all changes in risks and information since that transaction date. Where there are no recent market transactions then broker quotes, consensus pricing, proxy instruments or discounted cash flow models are used to determine fair value. Discounted cash flow models incorporate parameter inputs for credit risk, interest rate risk, foreign exchange risk, loss given default estimates and amounts utilized given default, as appropriate. Credit risk, loss given default and utilization given default parameters are determined using information from the loan or other credit markets, where available and appropriate.

Leveraged loans can have transaction-specific characteristics which can limit the relevance of market-observed transactions. Where similar transactions exist for which observable quotes are available from external pricing services then this information is used with appropriate adjustments to reflect the transaction differences. When no similar transactions exist, a discounted cash flow valuation technique is used with credit spreads derived from the appropriate leveraged loan index, incorporating the industry classification, subordination of the loan, and any other relevant information on the loan and loan counterparty.

Over-The-Counter Derivative Financial Instruments – Market standard transactions in liquid trading markets, such as interest rate swaps, foreign exchange forward and option contracts in G7 currencies, and equity swap and option contracts on listed securities or indices are valued using market standard models and quoted parameter inputs. Parameter inputs are obtained from pricing services, consensus pricing services and recently occurring transactions in active markets wherever possible.

More complex instruments are modeled using more sophisticated modeling techniques specific for the instrument and are calibrated to available market prices. Where the model output value does not calibrate to a relevant market reference then valuation adjustments are made to the model output value to adjust for any difference. In less active markets, data is obtained from less frequent market transactions, broker quotes and through extrapolation and interpolation techniques. Where observable prices or inputs are not available, management judgment is required to determine fair values by assessing other relevant sources of information such as historical data, fundamental analysis of the economics of the transaction and proxy information from similar transactions.

Financial Liabilities Designated at Fair Value through Profit or Loss under the Fair Value Option – The fair value of financial liabilities designated at fair value through profit or loss under the fair value option incorporates all market risk factors including a measure of the Group's credit risk relevant for that financial liability. The financial liabilities include structured note issuances, structured deposits, and other structured securities issued by consolidated vehicles, which may not be quoted in an active market. The fair value of these financial liabilities is determined by discounting the contractual cash flows using the relevant credit-adjusted yield curve. The market risk parameters are valued consistently to similar instruments held as assets, for example, any derivatives embedded within the structured notes are valued using the same methodology discussed in the "Over-The-Counter Derivative Financial Instruments" section above.

Where the financial liabilities designated at fair value through profit or loss under the fair value option are collateralized, such as securities loaned and securities sold under repurchase agreements, the credit enhancement is factored into the fair valuation of the liability.

Investment Contract Liabilities – Assets which are linked to the investment contract liabilities are owned by the Group. The investment contract obliges the Group to use these assets to settle these liabilities. Therefore, the fair value of investment contract liabilities is determined by the fair value of the underlying assets (i.e., amount payable on surrender of the policies).

Analysis of Financial Instruments with Fair Value Derived from Valuation Techniques Containing Significant Unobservable Parameters (Level 3)

Some of the financial assets and financial liabilities in Level 3 of the fair value hierarchy have identical or similar offsetting exposures to the unobservable input. However, according to IFRS they are required to be presented gross.

Trading Securities – Certain illiquid emerging market corporate bonds and illiquid highly structured corporate bonds are included in this level of the hierarchy. In addition, some of the holdings of notes issued by securitization entities, commercial and residential MBS, collateralized debt obligation securities and other ABS are reported here. The decrease in the period is mainly due to sales, settlements, losses and transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments, partially offset by purchases and issuances.

Positive and Negative Market Values from Derivative Instruments categorized in this level of the fair value hierarchy are valued based on one or more significant unobservable parameters. The unobservable parameters may include certain correlations, certain longer-term volatilities, certain prepayment rates, credit spreads and other transaction-specific parameters.

Level 3 derivatives include certain options where the volatility is unobservable; certain basket options in which the correlations between the referenced underlying assets are unobservable; longer-term interest rate option derivatives; multi-currency foreign exchange derivatives; and certain credit default swaps for which the credit spread is not observable.

The increase in assets during the period are driven by transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments, partially offset by settlements and losses. The decrease in liabilities during the period are driven by settlements and losses partially offset by transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments.

Other Trading Instruments classified in Level 3 of the fair value hierarchy mainly consist of traded loans valued using valuation models based on one or more significant unobservable parameters. Level 3 loans comprise illiquid leveraged loans and illiquid residential and commercial mortgage loans. The increase in the period refers to purchases, issuances and transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments partially offset by sales, settlements and losses.

Non-trading financial assets mandatory at fair value through profit or loss classified in Level 3 of fair value hierarchy consist of any non-trading financial asset that does not fall into the Hold to Collect nor Hold to Collect and Sell business models. This includes predominately reverse repurchase agreements which are managed on a fair value basis. Additionally, any financial asset that falls into the Hold to Collect or Hold to Collect and Sell business models for which the contractual cash flow characteristics are not SPPI. The increase in the period is driven by gains, issuances, purchases sales and transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments, partially offset by settlements and sales.

Financial Assets/Liabilities designated at Fair Value through Profit or Loss – Certain corporate loans and structured liabilities which were designated at fair value through profit or loss under the fair value option were categorized in this level of the fair value hierarchy. The corporate loans are valued using valuation techniques which incorporate observable credit spreads, recovery rates and unobservable utilization parameters. Revolving loan facilities are reported in the third level of the hierarchy because the utilization in the event of the default parameter is significant and unobservable.

In addition, certain hybrid debt issuances designated at fair value through profit or loss containing embedded derivatives are valued based on significant unobservable parameters. These unobservable parameters include single stock volatility correlations. The increase in assets during the period is driven by transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments and gains, partially offset by settlements. The increase in liabilities during the period is driven by issuances and transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments, partially offset by settlements and gains.

Financial assets at fair value through other comprehensive income include non-performing loan portfolios where there is no trading intent and the market is very illiquid. The increase in the period is driven by purchases, issuances and transfers between Level 2 and Level 3 due to changes in the observability of input parameters used to value these instruments, partially offset by sales, settlements and losses.

Reconciliation of financial instruments classified in Level 3

Reconciliation of financial instruments classified in Level 3

Dec 31, 2022

in € m.	Balance, beginning of year	Changes in the group of consoli- dated companies	Total gains/ losses ¹	Purchases	Sales	Issu- ances ²	Settle- ments ³	Transfers into Level 3 ⁴	Transfers out of Level 3 ⁴	Balance, end of year
Financial assets held at fair value:										
Trading securities	3,614	0	(380)	2,226	(1,974)	80	(344)	606	(776)	3,053
Positive market values from derivative financial instruments	9,042	0	(4,755)	0	0	0	(423)	8,011	(2,310)	9,564
Other trading assets	5,201	(0)	(178)	748	(1,945)	2,998	(1,419)	875	(785)	5,494
Non-trading financial assets mandatory at fair value through profit or loss	4,896	(0)	332	652	(142)	1,373	(1,430)	702	(593)	5,790
Financial assets designated at fair value through profit or loss	49	0	2	0	0	0	(45)	88	0	94
Financial assets at fair value through other comprehensive income	2,302	0	(107) ⁵	79	(338)	977	(752)	549	(36)	2,676
Other financial assets at fair value	78	0	0	0	0	0	0	0	(74)	5
Total financial assets held at fair value	25,182	(0)	(5,087)^{6,7}	3,706	(4,399)	5,428	(4,413)	10,831	(4,573)	26,675
Financial liabilities held at fair value:										
Trading securities	33	0	(3)	0	0	0	(0)	0	0	30
Negative market values from derivative financial instruments	9,781	0	(3,256)	0	0	0	(633)	4,454	(1,845)	8,500
Other trading liabilities	49	0	(51)	0	0	0	5	0	0	3
Financial liabilities designated at fair value through profit or loss	1,740	0	(55)	0	0	1,140	(202)	178	(10)	2,792
Other financial liabilities at fair value	(179)	0	(380)	0	0	0	64	16	(31)	(511)
Total financial liabilities held at fair value	11,424	0	(3,746)^{6,7}	0	0	1,140	(766)	4,649	(1,887)	10,815

¹ Total gains and losses predominantly relate to net gains (losses) on financial assets/liabilities at fair value through profit or loss reported in the consolidated statement of income. The balance also includes net gains (losses) on financial assets at fair value through other comprehensive income reported in the consolidated statement of income and unrealized net gains (losses) on financial assets at fair value through other comprehensive income and exchange rate changes reported in other comprehensive income, net of tax. Further, certain instruments are hedged with instruments in level 1 or level 2 but the table above does not include the gains and losses on these hedging instruments. Additionally, both observable and unobservable parameters may be used to determine the fair value of an instrument classified within level 3 of the fair value hierarchy; the gains and losses presented below are attributable to movements in both the observable and unobservable parameters.

² Issuances relate to the cash amount received on the issuance of a liability and the cash amount paid on the primary issuance of a loan to a borrower.

³ Settlements represent cash flows to settle the asset or liability. For debt and loan instruments this includes principal on maturity, principal amortizations and principal repayments. For derivatives all cash flows are presented in settlements.

⁴ Transfers in and transfers out of Level 3 are related to changes in observability of input parameters. During the year they are recorded at their fair value at the beginning of year. For instruments transferred into Level 3 the table shows the gains and losses and cash flows on the instruments as if they had been transferred at the beginning of the year. Similarly, for instruments transferred out of Level 3 the table does not show any gains or losses or cash flows on the instruments during the year since the table is presented as if they have been transferred out at the beginning of the year.

⁵ Total gains and losses on financial assets at fair value through other comprehensive income include a loss of € 189 million recognized in other comprehensive income, net of tax and a loss of € 2 million recognized in the income statement presented in net gains (losses).

⁶ This amount includes the effect of exchange rate changes. For total financial assets held at fair value this effect is a gain of € 425 million and for total financial liabilities held at fair value this is a loss of € 35 million.

⁷ For assets positive balances represent gains, negative balances represent losses. For liabilities positive balances represent losses, negative balances represent gains.

Dec 31, 2021

in € m.	Balance, beginning of year	Changes in the group of consoli- dated companies	Total gains/ losses ¹	Purchases	Sales	Issu- ances ²	Settle- ments ³	Transfers into Level 3 ⁴	Transfers out of Level 3 ⁴	Balance, end of year
Financial assets held at fair value:										
Trading securities	3,066	(2)	(263)	3,183	(2,445)	0	(106)	766	(585)	3,614
Positive market values from derivative financial instruments	8,725	0	890	0	0	0	(727)	2,938	(2,783)	9,042
Other trading assets	5,117	0	237	500	(2,194)	2,868	(1,635)	714	(406)	5,201
Non-trading financial assets mandatory at fair value through profit or loss	4,618	0	425	493	(288)	243	(733)	1,064	(926)	4,896
Financial assets designated at fair value through profit or loss	0	0	(0)	0	0	48	0	0	0	49
Financial assets at fair value through other comprehensive income	2,037	0	61 ⁵	53	(150)	662	(560)	350	(150)	2,302
Other financial assets at fair value	20	0	2	0	0	0	(17)	0	74	78
Total financial assets held at fair value	23,583	(2)	1,351^{6,7}	4,229	(5,076)	3,821	(3,777)	5,831	(4,777)	25,182
Financial liabilities held at fair value:										
Trading securities	2	0	0	0	0	0	(0)	33	(2)	33
Negative market values from derivative financial instruments	8,200	0	509	0	0	0	(367)	3,059	(1,620)	9,781
Other trading liabilities	0	0	(15)	0	0	0	0	64	0	49
Financial liabilities designated at fair value through profit or loss	960	0	15 ⁸	0	0	992 ⁸	(314)	198	(112)	1,740
Other financial liabilities at fair value	(294)	0	(12)	0	0	0	33	13	81	(179)
Total financial liabilities held at fair value	8,867	0	498^{6,7,8}	0	0	992⁸	(647)	3,367	(1,652)	11,424

¹ Total gains and losses predominantly relate to net gains (losses) on financial assets/liabilities at fair value through profit or loss reported in the consolidated statement of income. The balance also includes net gains (losses) on financial assets at fair value through other comprehensive income reported in the consolidated statement of income and unrealized net gains (losses) on financial assets at fair value through other comprehensive income and exchange rate changes reported in other comprehensive income, net of tax. Further, certain instruments are hedged with instruments in level 1 or level 2 but the table above does not include the gains and losses on these hedging instruments. Additionally, both observable and unobservable parameters may be used to determine the fair value of an instrument classified within level 3 of the fair value hierarchy; the gains and losses presented below are attributable to movements in both the observable and unobservable parameters.

² Issuances relate to the cash amount received on the issuance of a liability and the cash amount paid on the primary issuance of a loan to a borrower.

³ Settlements represent cash flows to settle the asset or liability. For debt and loan instruments this includes principal on maturity, principal amortizations and principal repayments. For derivatives all cash flows are presented in settlements.

⁴ Transfers in and transfers out of Level 3 are related to changes in observability of input parameters. During the year they are recorded at their fair value at the beginning of year. For instruments transferred into Level 3 the table shows the gains and losses and cash flows on the instruments as if they had been transferred at the beginning of the year. Similarly, for instruments transferred out of Level 3 the table does not show any gains or losses or cash flows on the instruments during the year since the table is presented as if they have been transferred out at the beginning of the year.

⁵ Total gains and losses on financial assets at fair value through other comprehensive income include a loss of € 13 million recognized in other comprehensive income, net of tax.

⁶ This amount includes the effect of exchange rate changes. For total financial assets held at fair value this effect is a gain of € 447 million and for total financial liabilities held at fair value this is a loss of € 44 million.

⁷ For assets positive balances represent gains, negative balances represent losses. For liabilities positive balances represent losses, negative balances represent gains.

⁸ Prior year's comparatives aligned to presentation in the current year.

Sensitivity Analysis of Unobservable Parameters

Where the value of financial instruments is dependent on unobservable parameter inputs, the precise level for these parameters at the balance sheet date might be drawn from a range of reasonably possible alternatives. In preparing the financial statements, appropriate levels for these unobservable input parameters are chosen so that they are consistent with prevailing market evidence and in line with the Group's approach to valuation control detailed above.

Where the Group to have marked the financial instruments concerned using parameter values drawn from the extremes of the ranges of reasonably possible alternatives, as of December 31, 2022 it could have increased fair value by as much as € 2.0 billion or decreased fair value by as much as € 1.4 billion. As of December 31, 2021 it could have increased fair value by as much as € 1.7 billion or decreased fair value by as much as € 1.2 billion.

The changes in sensitive amounts from December 31, 2021 to December 31, 2022 were an increase in positive fair value movement of € 220 million, and an increase in negative fair value movement of € 142 million.

The increase in positive and negative fair value movements are largely in line with the increase in Group Level 3 in the period, with Level 3 assets increasing from € 25.2 billion at December 31 2021 to € 26.7 billion at December 31 2022 and Group Level 3 liabilities decreasing from € 11.4 billion at December 31 2021 to € 10.8 billion at December 31 2022. These moves represent a percentage increase in gross Level 3 assets and liabilities of approximately 3 %.

The change in positive fair value movements from December 31, 2021 to December 31, 2022 represents an 13 % increase and the change in negative fair value movements represents an 12 % increase. Both the upside and the downside increases are proportionally larger than the 3 % increase in Group Level 3, due to increased volatility in the wider macro-economic environment, predominantly relating to interest rates and inflation.

The Group's sensitivity calculation of unobservable parameters for Level 3 aligns to the approach used to assess valuation uncertainty for Prudent Valuation purposes. Prudent Valuation is a capital requirement for assets held at fair value. It provides a mechanism for quantifying and capitalizing valuation uncertainty in accordance with the European Commission Delegated Regulation (EU) 2016/101, which supplements Article 34 of Regulation (EU) No. 2019/876 (CRR), requiring institutions to apply as a deduction from CET 1 for the amount of any additional valuation adjustments on all assets measured at fair value calculated in accordance with Article 105 (14). This utilizes exit price analysis performed for the relevant assets and liabilities in the Prudent Valuation assessment. The downside sensitivity may be limited in some cases where the fair value is already demonstrably prudent.

This disclosure is intended to illustrate the potential impact of the relative uncertainty in the fair value of financial instruments for which valuation is dependent on unobservable input parameters. However, it is unlikely in practice that all unobservable parameters would be simultaneously at the extremes of their ranges of reasonably possible alternatives. Hence, the estimates disclosed above are likely to be greater than the true uncertainty in fair value at the balance sheet date. Furthermore, the disclosure is neither predictive nor indicative of future movements in fair value.

For many of the financial instruments considered here, in particular derivatives, unobservable input parameters represent only a subset of the parameters required to price the financial instrument, the remainder being observable. Hence for these instruments the overall impact of moving the unobservable input parameters to the extremes of their ranges might be relatively small compared with the total fair value of the financial instrument. For other instruments, fair value is determined based on the price of the entire instrument, for example, by adjusting the fair value of a reasonable proxy instrument. In addition, all financial instruments are already carried at fair values which are inclusive of valuation adjustments for the cost to close out that instrument and hence already factor in uncertainty as it reflects itself in market pricing. Any negative impact of uncertainty calculated within this disclosure, then, will be over and above that already included in the fair value contained in the financial statements.

Breakdown of the sensitivity analysis by type of instrument¹

in € m.	Dec 31, 2022		Dec 31, 2021	
	Positive fair value movement from using reasonable possible alternatives	Negative fair value movement from using reasonable possible alternatives	Positive fair value movement from using reasonable possible alternatives	Negative fair value movement from using reasonable possible alternatives
Securities:				
Debt securities	239	274	267	256
Commercial mortgage-backed securities	15	20	18	15
Mortgage and other asset-backed securities	20	26	13	9
Corporate, sovereign and other debt securities	204	228	236	233
Equity securities	114	80	94	65
Derivatives:				
Credit	218	125	163	109
Equity	70	63	105	100
Interest related	605	217	409	232
Foreign Exchange	37	30	34	31
Other	59	110	98	82
Loans:				
Loans	618	459	570	340
Other	0	0	0	0
Total	1,959	1,357	1,739	1,215

¹ Where the exposure to an unobservable parameter is offset across different instruments then only the net impact is disclosed in the table.

Quantitative Information about the Sensitivity of Significant Unobservable Inputs

The behavior of the unobservable parameters on Level 3 fair value measurement is not necessarily independent, and dynamic relationships often exist between the other unobservable parameters and the observable parameters. Such relationships, where material to the fair value of a given instrument, are explicitly captured via correlation parameters, or are otherwise controlled via pricing models or valuation techniques. Frequently, where a valuation technique utilizes more than one input, the choice of a certain input will bound the range of possible values for other inputs. In addition, broader market factors (such as interest rates, equity, credit or commodity indices or foreign exchange rates) can also have effects.

The range of values shown below represents the highest and lowest inputs used to value the significant exposures within Level 3. The diversity of financial instruments that make up the disclosure is significant and therefore the ranges of certain parameters can be large. For example, the range of credit spreads on mortgage backed securities represents performing, more liquid positions with lower spreads than the less liquid, non-performing positions which will have higher credit spreads. As Level 3 contains the less liquid fair value instruments, the wide ranges of parameters seen is to be expected, as there is a high degree of pricing differentiation within each exposure type to capture the relevant market dynamics. There follows a brief description of each of the principal parameter types, along with a commentary on significant interrelationships between them.

Credit Parameters are used to assess the creditworthiness of an exposure, by enabling the probability of default and resulting losses of a default to be represented. The credit spread is the primary reflection of creditworthiness and represents the premium or yield return above the benchmark reference instrument (typically LIBOR, or relevant Treasury Instrument, depending upon the asset being assessed), that a bond holder would require to allow for the credit quality difference between that entity and the reference benchmark. Higher credit spreads will indicate lower credit quality, and lead to a lower value for a given bond, or other loan-asset that is to be repaid to the Bank by the borrower. Recovery Rates represent an estimate of the amount a lender would receive in the case of a default of a loan, or a bond holder would receive in the case of default of the bond. Higher recovery rates will give a higher valuation for a given bond position, if other parameters are held constant. Constant Default Rate and Constant Prepayment Rate allow more complex loan and debt assets to be assessed, as these parameters estimate the ongoing defaults arising on scheduled repayments and coupons, or whether the borrower is making additional (usually voluntary) prepayments. These parameters are particularly relevant when forming a fair value opinion for mortgage or other types of lending, where repayments are delivered by the borrower through time, or where the borrower may pre-pay the loan (seen for example in some residential mortgages). Higher Constant Default Rate will lead to lower valuation of a given loan or mortgage as the lender will ultimately receive less cash.

Interest rates, credit spreads, inflation rates, foreign exchange rates and equity prices are referenced in some option instruments, or other complex derivatives, where the payoff a holder of the derivative will receive is dependent upon the behavior of these underlying references through time. Volatility parameters describe key attributes of option behavior by enabling the variability of returns of the underlying instrument to be assessed. This volatility is a measure of probability, with higher volatilities denoting higher probabilities of a particular outcome occurring. The underlying references (interest rates, credit spreads etc.) have an effect on the valuation of options, by describing the size of the return that can be expected from the option. Therefore the value of a given option is dependent upon the value of the underlying instrument, and the volatility of that instrument, representing the size of the payoff, and the probability of that payoff occurring. Where volatilities are high, the option holder will see a higher option value as there is greater probability of positive returns. A higher option value will also occur where the payoff described by the option is significant.

Correlations are used to describe influential relationships between underlying references where a derivative or other instrument has more than one underlying reference. Behind some of these relationships, for example commodity correlation and interest rate-foreign exchange correlations, typically lie macroeconomic factors such as the impact of global demand on groups of commodities, or the pricing parity effect of interest rates on foreign exchange rates. More specific relationships can exist between credit references or equity stocks in the case of credit derivatives and equity basket derivatives, for example. Credit correlations are used to estimate the relationship between the credit performance of a range of credit names, and stock correlations are used to estimate the relationship between the returns of a range of equities. A derivative with a correlation exposure will be either long- or short-correlation. A high correlation suggests a strong relationship between the underlying references is in force, and this will lead to an increase in value of a long-correlation derivative. Negative correlations suggest that the relationship between underlying references is opposing, i.e., an increase in price of one underlying reference will lead to a reduction in the price of the other.

An EBITDA ('earnings before interest, tax, depreciation and amortization') multiple approach can be used in the valuation of less liquid securities. Under this approach the enterprise value ('EV') of an entity can be estimated via identifying the ratio of the EV to EBITDA of a comparable observable entity and applying this ratio to the EBITDA of the entity for which a valuation is being estimated. Under this approach a liquidity adjustment is often applied due to the difference in liquidity between the generally listed comparable used and the company under valuation. A higher EV/EBITDA multiple will result in a higher fair value.

Financial instruments classified in Level 3 and quantitative information about unobservable inputs

Dec 31, 2022

	Fair value				30.06.2022	
in € m. (unless stated otherwise)	Assets	Liabilities	Valuation technique(s) ¹	Significant unobservable input(s) (Level 3)	Range	
Financial instruments held at fair value –						
Non-Derivative financial instruments held at fair value:						
Mortgage and other asset backed securities held for trading:						
Commercial mortgage-backed securities	22	0	Price based Discounted cash flow	Price Credit spread (bps)	0 % 182	100 % 1,720
Mortgage- and other asset-backed securities	128	0	Price based Discounted cash flow	Price Credit spread (bps) Recovery rate Constant default rate Constant prepayment rate	0 % 169 16 % 0 % 3 %	99 % 2,672 95 % 16 % 29 %
Total mortgage- and other asset-backed securities	151	0				
Debt securities and other debt obligations	4,720	2,625	Price based	Price	0 %	181 %
Held for trading	2,741	30	Discounted cash flow	Credit spread (bps)	62	1,369
Corporate, sovereign and other debt securities	2,741					
Non-trading financial assets mandatory at fair value through profit or loss	1,844					
Designated at fair value through profit or loss	0	2,594				
Financial assets at fair value through other comprehensive income	135					
Equity securities	787	0	Market approach	Price per net asset value Enterprise value/EBITDA (multiple) Weighted average cost capital	0 % 5 8 %	100 % 13 20 %
Held for trading	161	0				
Non-trading financial assets mandatory at fair value through profit or loss	626		Discounted cash flow			
Designated at fair value through profit or loss	0		Price based	Price	0 %	150 %
Loans	8,819	3	Price based	Price	0 %	122 %
Held for trading	5,298	3	Discounted cash flow	Credit spread (bps)	133	1,520
Non-trading financial assets mandatory at fair value through profit or loss	925					
Designated at fair value through profit or loss	94	0		Recovery rate	40 %	75 %
Financial assets at fair value through other comprehensive income	2,502					
Loan commitments	0	12	Discounted cash flow	Credit spread (bps) Recovery rate	94 35 %	925 76 %
			Loan pricing model	Utilization	0 %	100 %
Other financial instruments	2,629 ²	186 ³	Discounted cash flow	IRR Repo rate (bps)	7 % 2	13 % 525
Total non-derivative financial instruments held at fair value	17,106	2,825				

¹ Valuation technique(s) and subsequently the significant unobservable input(s) relate to the respective total position.

² Other financial assets include € 196 million of other trading assets, € 2.4 billion of other non-trading financial assets mandatory at fair value, and € 38 million other financial assets at fair value through other comprehensive income.

³ Other financial liabilities include € 141 million of securities sold under repurchase agreements designated at fair value and € 45 million other financial liabilities designated at fair value.

Dec 31, 2022

in € m. (unless stated otherwise)	Fair value		Valuation technique(s)	Significant unobservable input(s) (Level 3)	Range	
	Assets	Liabilities				
Financial instruments held at fair value:						
Market values from derivative						
financial instruments:						
Interest rate derivatives	6,360	4,546	Discounted cash flow	Swap rate (bps)	(1,748)	1,301
				Inflation swap rate	(1) %	14 %
				Constant default rate	0 %	15 %
				Constant prepayment rate	0 %	19 %
			Option pricing model	Inflation volatility	1 %	6 %
				Interest rate volatility	0 %	43 %
				IR - IR correlation	(1) %	99 %
				Hybrid correlation	(90) %	90 %
Credit derivatives	577	517	Discounted cash flow	Credit spread (bps)	1	4,885
				Recovery rate	0 %	40 %
			Correlation pricing model	Credit correlation	25 %	69 %
Equity derivatives	452	1,155	Option pricing model	Stock volatility	0 %	75 %
				Index volatility	13 %	30 %
				Index - index correlation	88 %	96 %
				Stock - stock correlation	0 %	0 %
				Stock Forwards	1 %	11 %
				Index Forwards	0 %	6 %
FX derivatives	1,646	1,976	Option pricing model	Volatility	(12) %	48 %
				Quoted Vol	0 %	0 %
Other derivatives	534	(205) ¹	Discounted cash flow	Swap rate (bps)	(6)	46
			Discounted cash flow	Credit spread (bps)	0	0
			Option pricing model	Index volatility	0 %	91 %
				Commodity correlation	0 %	85 %
Total market values from derivative						
financial instruments	9,569	7,989				

¹ Includes derivatives which are embedded in contracts where the host contract is held at amortized cost but for which the embedded derivative is separated.

Dec 31, 2021

in € m. (unless stated otherwise)	Fair value		Valuation technique(s) ¹	Significant unobservable input(s) (Level 3)	Range	
	Assets	Liabilities				
Financial instruments held at fair value –						
Non-Derivative financial instruments						
held at fair value:						
Mortgage and other asset backed securities held for trading:						
Commercial mortgage-backed securities	47	0	Price based	Price	0 %	114 %
			Discounted cash flow	Credit spread (bps)	81	1,235
Mortgage- and other asset-backed securities	81	0	Price based	Price	0 %	112 %
			Discounted cash flow	Credit spread (bps)	85	1,495
				Recovery rate	0 %	85 %
				Constant default rate	0 %	2 %
				Constant prepayment rate	0 %	27 %
Total mortgage- and other asset-backed securities	128	0				
Debt securities and other debt obligations	5,074	1,654	Price based	Price	0 %	212 %
Held for trading	3,383	33	Discounted cash flow	Credit spread (bps)	12	571
Corporate, sovereign and other debt securities	3,383					
Non-trading financial assets mandatory at fair value through profit or loss	1,568					
Designated at fair value through profit or loss	0	1,621				
Financial assets at fair value through other comprehensive income	123					
Equity securities	660	0	Market approach	Price per net asset value	0 %	101 %
Held for trading	103	0		Enterprise value/EBITDA (multiple)	5	17
Non-trading financial assets mandatory at fair value through profit or loss	557		Discounted cash flow	Weighted average cost capital	6 %	20 %
Designated at fair value through profit or loss	0		Price based	Price	0 %	139 %
Loans	8,184	49	Price based	Price	0 %	275 %
Held for trading	5,188	49	Discounted cash flow	Credit spread (bps)	34	2,117
Non-trading financial assets mandatory at fair value through profit or loss	769					
Designated at fair value through profit or loss	48	0		Recovery rate	40 %	85 %
Financial assets at fair value through other comprehensive income	2,179					
Loan commitments	0	7	Discounted cash flow	Credit spread (bps)	128	906
				Recovery rate	40 %	75 %
			Loan pricing model	Utilization	0 %	100 %
Other financial instruments	2,016 ²	112 ³	Discounted cash flow	IRR	7 %	16 %
				Repo rate (bps)	(27)	400
Total non-derivative financial instruments held at fair value	16,062	1,823				

¹ Valuation technique(s) and subsequently the significant unobservable input(s) relate to the respective total position.

² Other financial assets include € 13 million of other trading assets and € 2.0 billion other financial assets mandatory at fair value.

³ Other financial liabilities include € 112 million of securities sold under repurchase agreements designated at fair value.

Dec 31, 2021

	Fair value				December 2021	
in € m. (unless stated otherwise)	Assets	Liabilities	Valuation technique(s)	Significant unobservable input(s) (Level 3)	Range	
Financial instruments held at fair value:						
Market values from derivative financial instruments:						
Interest rate derivatives	4,725	4,724	Discounted cash flow	Swap rate (bps)	(80)	817
				Inflation swap rate	1 %	5 %
				Constant default rate	0 %	20 %
				Constant prepayment rate	4 %	24 %
			Option pricing model	Inflation volatility	0 %	9 %
				Interest rate volatility	0 %	31 %
				IR - IR correlation	(1) %	99 %
				Hybrid correlation	(70) %	100 %
Credit derivatives	686	827	Discounted cash flow	Credit spread (bps)	2	6,630
				Recovery rate	0 %	40 %
			Correlation pricing model	Credit correlation	30 %	63 %
Equity derivatives	766	1,749	Option pricing model	Stock volatility	25 %	68 %
				Index volatility	11 %	80 %
				Index - index correlation	88 %	91 %
				Stock - stock correlation	0 %	0 %
				Stock Forwards	0 %	9 %
				Index Forwards	0 %	5 %
FX derivatives	1,816	1,913	Option pricing model	Volatility	(33) %	59 %
				Quoted Vol	0 %	0 %
Other derivatives	1,127	388 ¹	Discounted cash flow	Credit spread (bps)	0	0
			Option pricing model	Index volatility	0 %	131 %
				Commodity correlation	15 %	86 %
Total market values from derivative financial instruments	9,120	9,601				

¹ Includes derivatives which are embedded in contracts where the host contract is held at amortized cost but for which the embedded derivative is separated.

Unrealized Gains or Losses on Level 3 Instruments held or in Issue at the Reporting Date

Instruments classified as Level 3 have an unobservable input which has a significant impact on the fair value of the instrument. However, the other inputs into the instrument may be observable i.e. Level 1 or 2. Therefore unrealized gains or losses on Level 3 Instruments are not due solely to unobservable parameters. Additionally, many of the positions in this level of the hierarchy are economically hedged by instruments which are categorized in Level 1 or 2 of the fair value hierarchy. The offsetting gains and losses that have been recorded on all such hedges are not included in the table below, which only shows the gains and losses related to the Level 3 classified instruments themselves held at the reporting date in accordance with IFRS 13. The unrealized gains and losses on Level 3 instruments are included in both net interest income and net gains on financial assets/liabilities at fair value through profit or loss in the consolidated income statement.

in € m.	Dec 31, 2022	Dec 31, 2021
Financial assets held at fair value:		
Trading securities	(298)	(332)
Positive market values from derivative financial instruments	(2,907)	1,556
Other trading assets	(251)	93
Non-trading financial assets mandatory at fair value through profit or loss	247	241
Financial assets designated at fair value through profit or loss	(0)	(0)
Other financial assets at fair value	0	3
Total financial assets held at fair value	(3,209)	1,560
Financial liabilities held at fair value:		
Trading securities	3	(0)
Negative market values from derivative financial instruments	1,634	(1,292)
Other trading liabilities	2	15
Financial liabilities designated at fair value through profit or loss	55	1 ¹
Other financial liabilities at fair value	358	8
Total financial liabilities held at fair value	2,053	(1,269)¹
Total	(1,156)	291¹

¹ Prior year's comparatives aligned to presentation in the current year.

Recognition of Trade Date Profit

If there are significant unobservable inputs used in a valuation technique, the financial instrument is recognized at the transaction price and any trade date profit is deferred. The table below presents the year-to-year movement of the trade date profits deferred due to significant unobservable parameters for financial instruments classified at fair value through profit or loss. The balance is predominantly related to derivative instruments.

in € m.	2022	2021
Balance, beginning of year	462	454
New trades during the period	265	212
Amortization	(111)	(142)
Matured trades	(60)	(61)
Subsequent move to observability	(9)	(4)
Exchange rate changes	3	2
Balance, end of year	550	462

14 – Fair Value of Financial Instruments not carried at Fair Value

Financial instruments not carried at fair value are not managed on a fair value basis. For these instruments fair values are calculated for disclosure purposes only and do not impact the Group balance sheet or income statement. Additionally, since the instruments generally do not trade there is significant management judgment required to determine these fair values.

For the following financial instruments which are predominantly short-term the carrying value represents a reasonable estimate of the fair value:

Assets	Liabilities
Cash and central bank balances	Deposits
Interbank balances (w/o central banks)	Central bank funds purchased and securities sold under repurchase agreements
Central bank funds sold and securities purchased under resale agreements	Securities loaned
Securities borrowed	Other short-term borrowings
Other financial assets	Other financial liabilities

For retail lending portfolios with a large number of homogenous loans (e.g. residential mortgages), the fair value is calculated for each product type by discounting the portfolio's contractual cash flows using the Group's new loan rates for lending to issuers of similar credit quality. Key inputs for retail mortgages are the difference between historic and current product margins and the estimated prepayment rates. Capitalized broker fees included in the carrying value are considered to also be at fair value.

The fair value of the corporate lending portfolio is estimated by discounting the loan till its maturity based on loan specific credit spreads and funding costs for the Group.

For long-term debt and trust preferred securities, fair value is determined from quoted market prices, where available. Where quoted market prices are not available, fair value is estimated using a valuation technique that discounts the remaining contractual cash flows at a rate at which an instrument with similar characteristics is quoted in the market.

Estimated fair value of financial instruments not carried at fair value on the balance sheet¹

					Dec 31, 2022
in € m.	Carrying value	Fair value	Quoted prices in active market (Level 1)	Valuation technique observable parameters (Level 2)	Valuation technique unobservable parameters (Level 3)
Financial assets:					
Cash and central bank balances	178,896	178,896	178,896	0	0
Interbank balances (w/o central banks)	7,195	7,195	0	7,194	0
Central bank funds sold and securities purchased under resale agreements	11,478	11,505	0	10,363	1,142
Securities borrowed	0	0	0	0	0
Loans	491,175	461,070	0	12,038	449,032
Other financial assets	110,066	107,878	16,046	90,842	989
Financial liabilities:					
Deposits	629,183	629,629	1,736	627,893	0
Central bank funds purchased and securities sold under repurchase agreements	573	572	0	572	0
Securities loaned	13	13	0	13	0
Other short-term borrowings	5,122	5,121	0	5,115	7
Other financial liabilities	93,135	93,135	2,007	91,127	0
Long-term debt	131,525	127,743	0	123,525	4,219
Trust preferred securities	500	426	0	426	0

					Dec 31, 2021
in € m.	Carrying value	Fair value	Quoted prices in active market (Level 1)	Valuation technique observable parameters (Level 2)	Valuation technique unobservable parameters (Level 3)
Financial assets:					
Cash and central bank balances	192,021	192,021	192,021	0	0
Interbank balances (w/o central banks)	7,342	7,342	0	7,342	0
Central bank funds sold and securities purchased under resale agreements	8,368	8,429	0	7,651	778
Securities borrowed	63	63	0	63	0
Loans	472,069	476,674	0	13,682	462,991
Other financial assets	97,282 ²	97,426 ²	9,048	88,029 ²	349
Financial liabilities:					
Deposits	604,396	604,645	307	604,338	0
Central bank funds purchased and securities sold under repurchase agreements	747	745	0	745	0
Securities loaned	24	24	0	24	0
Other short-term borrowings	4,034	4,035	0	4,010	25
Other financial liabilities	81,047	81,047	2,023	79,023	0
Long-term debt	144,485	146,871	0	141,189	5,683
Trust preferred securities	528	587	0	587	0

¹ Amounts generally presented on a gross basis, in line with the Group's accounting policy regarding offsetting of financial instruments as described in Note 1 "Significant Accounting Policies and Critical Accounting Estimates".

² Prior year's comparatives aligned to presentation in the current year.

As of December 31, 2022, for loans, the difference between fair value and carrying value is primarily driven by the current interest rates on long-dated retail mortgages in Germany compared to the contractual rate. For long-term debt and trust preferred securities, the difference between fair value and carrying value is due to the change in interest rates at which the Group could issue debt with similar maturity and subordination at the balance sheet date compared to the rate the instrument was issued at. The decrease in the fair values as of December 31, 2022 is consistent with the rising interest rate environment compared to December 31, 2021. The carrying values included in the table do not include any impacts from economic hedges.

15 – Financial assets at fair value through other comprehensive income

in € m.	Dec 31, 2022	Dec 31, 2021
Securities purchased under resale agreement	2,156	1,231
Debt securities:		
German government	602	876
U.S. Treasury and U.S. government agencies	12,334	8,770
U.S. local (municipal) governments	392	253
Other foreign governments	9,960	10,965
Corporates	708	604
Other asset-backed securities	0	0
Mortgage-backed securities, including obligations of U.S. federal agencies	486	714
Other debt securities	969	1,194
Total debt securities	25,450	23,377
Loans	4,069	4,370
Total financial assets at fair value through other comprehensive income	31,675	28,979

16 – Equity Method Investments

Investments in associates and jointly controlled entities are accounted for using the equity method of accounting.

The Group holds interests in 53 associates and 9 jointly controlled entities as of December 31, 2022 (59 and 10, respectively, as of December 31, 2021). Two associates are considered to be material to the Group.

Significant investments as of December 31, 2022¹

Investment	Principal place of business	Nature of relationship	Ownership percentage
Huarong Rongde Asset Management Company Limited	Beijing, China	Strategic investment	40.7 %
Harvest Fund Management Co., Ltd.	Shanghai, China	Strategic investment	30.0 %

¹ The Group has significant influence over these investees through its holding percentage and representation on the board seats.

Summarized financial information on Huarong Rongde Asset Management Company Limited¹

in € m.	Dec 31, 2021	Dec 31, 2020
Total net revenues	(138)	76
Net income	(102)	54
Other comprehensive income	0	0
Total comprehensive income²	(102)	54

in € m.	Dec 31, 2021	Dec 31, 2020
Current assets	2,738	2,979
Non-Current assets	568	247
Total assets	3,306	3,226
Current liabilities	2,132	1,273
Non-Current liabilities	460	1,180
Total liabilities	2,592	2,453
Noncontrolling Interest	0	0
Net assets of the equity method investee	714	773

¹ Due to the difference in reporting timelines for the Group and Huarong Rongde Asset Management Company Limited Equity method accounting was performed for December 2022 based on December 2021 PRC GAAP audited financials and for December 2021 based on December 2020 PRC GAAP audited financials.

² The Group received dividends from Huarong Rongde Asset Management Company Limited of € 0 million during the reporting period 2022 (2021: € 0 million). The Group is entitled to declared dividends of € 9 million for the financial year of 2021.

Reconciliation of total net assets of Huarong Rongde Asset Management Company Limited to the Group's carrying amount¹

in € m.	Dec 31, 2021	Dec 31, 2020
Net assets of the equity method investee	714	773
Group's ownership percentage on the investee's equity	40.7 %	40.7 %
Group's share of net assets	291	315
Goodwill	0	0
Intangible Assets	0	0
Other adjustments ²	(64)	(97)
Carrying amount	227	218

¹ Due to the difference in reporting timelines for the Group and Huarong Rongde Asset Management Company Limited Equity method accounting was performed for December 2022 based on December 2021 PRC GAAP audited financials and for December 2021 based on December 2020 PRC GAAP audited financials.

² There is life to date impairment loss of € 97 million in 2022 (€ 97 million in 2021). The loss was driven by impairment write downs from underperforming credit balances in the weaker Chinese real estate sector since 2021.

Summarized financial information on Harvest Fund Management Co., Ltd.

in € m.	Dec 31, 2022 ¹	Dec 31, 2021 ²
Total net revenues	982	1,190
Net income	234	305
Other comprehensive income	7	(2)
Total comprehensive income³	241	304

in € m.	Dec 31, 2022	Dec 31, 2021
Current assets	1,319	1,372
Non-Current assets	945	982
Total assets	2,264	2,354
Current liabilities	967	1,080
Non-Current liabilities	169	207
Total liabilities	1,136	1,287
Noncontrolling Interest	47	40
Net assets of the equity method investee	1,081	1,027

¹ December 31, 2022 numbers are based on 2022 unaudited financials.

² December 31, 2021 numbers are based on 2021 audited financials.

³ The Group received dividends from Harvest Fund Management Co., Ltd. of € 45 million during the reporting period 2022 (2021: € 68 million).

Reconciliation of total net assets of Harvest Fund Management Co., Ltd. to the Group's carrying amount

in € m.	Dec 31, 2022 ¹	Dec 31, 2021 ²
Net assets of the equity method investee	1,081	1,027
Group's ownership percentage on the investee's equity	30 %	30 %
Group's share of net assets	324	308
Goodwill	18	17
Intangible Assets	15	15
Other adjustments	4	1
Carrying amount³	361	341

¹ December 31, 2022 numbers are based on 2022 unaudited financials.

² December 31, 2021 numbers are based on 2021 audited financials.

³ There is no impairment loss in 2022 (€ 0 million in 2021).

Aggregated financial information on the Group's share in associates and joint ventures that are individually immaterial

in € m.	Dec 31, 2022	Dec 31, 2021
Carrying amount of all associates that are individually immaterial to the Group	536	532
Aggregated amount of the Group's share of profit (loss) from continuing operations	100	87
Aggregated amount of the Group's share of post-tax profit (loss) from discontinued operations	0	0
Aggregated amount of the Group's share of other comprehensive income	15	(6)
Aggregated amount of the Group's share of total comprehensive income	115	81

17 – Offsetting Financial Assets and Financial Liabilities

The Group is eligible to present certain financial assets and financial liabilities on a net basis on the balance sheet pursuant to criteria described in Note 1 “Significant Accounting Policies and Critical Accounting Estimates: Offsetting Financial Instruments”.

The following tables provide information on the impact of offsetting on the consolidated balance sheet, as well as the financial impact of netting for instruments subject to an enforceable master netting arrangement or similar agreement as well as available cash and financial instrument collateral.

Assets

in € m.	Dec 31, 2022						
	Amounts not set off on the balance sheet						Net amount
	Gross amounts of financial assets	Gross amounts set off on the balance sheet	Net amounts of financial assets presented on the balance sheet	Impact of Master Netting Agreements	Cash collateral	Financial instrument collateral ¹	
Central bank funds sold and securities purchased under resale agreements (enforceable)	20,068	(8,621)	11,447	(700)	0	(10,746)	1
Central bank funds sold and securities purchased under resale agreements (non-enforceable)	31	0	31	0	0	(25)	6
Securities borrowed (enforceable)	0	0	0	0	0	0	0
Securities borrowed (non-enforceable)	0	0	0	0	0	0	0
Financial assets at fair value through profit or loss (enforceable)	508,498	(144,206)	364,292	(229,841)	(41,924)	(80,591)	11,937
Of which: Positive market values from derivative financial instruments (enforceable)	308,577	(18,302)	290,275	(227,361)	(41,921)	(9,076)	11,917
Financial assets at fair value through profit or loss (non-enforceable)	118,253	0	118,253	0	(1,101)	(10,167)	106,984
Of which: Positive market values from derivative financial instruments (non-enforceable)	9,581	0	9,581	0	(966)	(1,327)	7,288
Total financial assets at fair value through profit or loss	626,751	(144,206)	482,545	(229,841)	(43,025)	(90,759)	118,921
Loans at amortized cost	491,175	0	491,175	0	(12,278)	(66,762)	412,136
Other assets	128,279	(10,155)	118,124	(29,171)	(78)	(14)	88,861
Of which: Positive market values from derivatives qualifying for hedge accounting (enforceable)	1,319	(72)	1,248	(1,027)	(78)	(14)	129
Remaining assets subject to netting	2,156	0	2,156	0	0	0	2,156
Remaining assets not subject to netting	238,738	0	238,738	0	(111)	(2,995)	235,633
Total assets	1,507,199	(162,982)	1,344,217	(259,712)	(55,492)	(171,299)	857,714

¹ Excludes real estate and other non-financial instrument collateral.

Liabilities

Dec 31, 2022

in € m.	Gross amounts of financial liabilities	Gross amounts set off on the balance sheet	Net amounts of financial liabilities presented on the balance sheet	Amounts not set off on the balance sheet			Net amount
				Impact of Master Netting Agreements	Cash collateral	Financial instrument collateral ¹	
Deposits	629,183	0	629,183	0	0	0	629,183
Central bank funds purchased and securities sold under repurchase agreements (enforceable)	9,032	(8,621)	411	0	0	(410)	0
Central bank funds purchased and securities sold under repurchase agreements (non-enforceable)	162	0	162	0	0	(51)	111
Securities loaned (enforceable)	7	0	7	0	0	(7)	0
Securities loaned (non-enforceable)	6	0	6	0	0	(6)	0
Financial liabilities at fair value through profit or loss (enforceable)	508,361	(141,869)	366,492	(230,419)	(26,319)	(44,516)	65,238
Of which: Negative market values from derivative financial instruments (enforceable)	287,488	(16,403)	271,085	(227,825)	(26,319)	(2,319)	14,622
Financial liabilities at fair value through profit or loss (non-enforceable)	21,646	0	21,646	0	(880)	(4,245)	16,521
Of which: Negative market values from derivative financial instruments (non-enforceable)	11,333	0	11,333	0	(736)	(209)	10,388
Total financial liabilities at fair value through profit or loss	530,007	(141,869)	388,138	(230,419)	(27,199)	(48,761)	81,759
Other liabilities	126,140	(12,492)	113,648	(44,055)	(76)	(2)	69,516
Of which: Negative market values from derivatives qualifying for hedge accounting (enforceable)	751	(30)	721	(563)	(76)	(2)	80
Remaining liabilities not subject to netting	140,521	0	140,521	0	0	0	140,521
Total liabilities	1,435,058	(162,982)	1,272,076	(274,473)	(27,275)	(49,238)	921,090

Assets

Dec 31, 2021

in € m.	Gross amounts of financial assets	Gross amounts set off on the balance sheet	Net amounts of financial assets presented on the balance sheet	Amounts not set off on the balance sheet			Net amount
				Impact of Master Netting Agreements	Cash collateral	Financial instrument collateral ¹	
Central bank funds sold and securities purchased under resale agreements (enforceable)	14,449	(8,532)	5,917	0	0	(5,667)	251
Central bank funds sold and securities purchased under resale agreements (non-enforceable)	2,451	0	2,451	0	0	(2,403)	48
Securities borrowed (enforceable)	63	0	63	0	0	(63)	0
Securities borrowed (non-enforceable)	0	0	0	0	0	0	0
Financial assets at fair value through profit or loss (enforceable)	471,208	(117,093)	354,116	(240,588)	(33,953)	(71,766)	7,809
Of which: Positive market values from derivative financial instruments (enforceable)	296,606	(12,044)	284,562	(238,412)	(33,950)	(4,516)	7,685
Financial assets at fair value through profit or loss (non-enforceable)	137,118	0	137,118	0	(2,026)	(12,124)	122,968
Of which: Positive market values from derivative financial instruments (non-enforceable)	15,170	0	15,170	0	(1,963)	(1,263)	11,944
Total financial assets at fair value through profit or loss	608,326	(117,093)	491,233	(240,588)	(35,978)	(83,890)	130,777
Loans at amortized cost	472,069	0	472,069	0	(12,271)	(60,794)	399,004
Other assets	109,097	(5,313)	103,784	(30,639)	(101)	(63)	72,981
Of which: Positive market values from derivatives qualifying for hedge accounting (enforceable)	1,126	(21)	1,105	(881)	(101)	(63)	60
Remaining assets subject to netting	1,231	0	1,231	0	0	0	1,231
Remaining assets not subject to netting	247,956	0	247,956	0	(141)	(2,320)	245,495
Total assets	1,455,642	(130,937)	1,324,705	(271,227)	(48,492)	(155,200)	849,786

¹ Excludes real estate and other non-financial instrument collateral.

Liabilities

Dec 31, 2021

in € m.	Gross amounts of financial liabilities	Gross amounts set off on the balance sheet	Net amounts of financial liabilities presented on the balance sheet	Amounts not set off on the balance sheet			Net amount
				Impact of Master Netting Agreements	Cash collateral	Financial instrument collateral ¹	
Deposits	604,396	0	604,396	0	0	0	604,396
Central bank funds purchased and securities sold under repurchase agreements (enforceable)	9,275	(8,532)	743	0	0	(743)	0
Central bank funds purchased and securities sold under repurchase agreements (non-enforceable)	4	0	4	0	0	0	4
Securities loaned (enforceable)	22	0	22	0	0	(22)	0
Securities loaned (non-enforceable)	2	0	2	0	0	(2)	0
Financial liabilities at fair value through profit or loss (enforceable)	497,741	(117,796)	379,945	(240,381)	(27,607)	(50,690)	61,267
Of which: Negative market values from derivative financial instruments (enforceable)	289,380	(13,246)	276,134	(237,915)	(27,607)	(4,063)	6,549
Financial liabilities at fair value through profit or loss (non-enforceable)	20,913	0	20,913	0	(1,261)	(4,658)	14,994
Of which: Negative market values from derivative financial instruments (non-enforceable)	10,975	0	10,975	0	(1,261)	(157)	9,556
Total financial liabilities at fair value through profit or loss	518,653	(117,796)	400,857	(240,381)	(28,868)	(55,347)	76,261
Other liabilities	102,405	(4,609)	97,795	(38,677)	(49)	(2)	59,067
Of which: Negative market values from derivatives qualifying for hedge accounting (enforceable)	1,479	(13)	1,466	(1,378)	(49)	(2)	37
Remaining liabilities not subject to netting	152,786	0	152,786	0	0	0	152,786
Total liabilities	1,387,544	(130,937)	1,256,606	(279,058)	(28,918)	(56,117)	892,514

The column 'Gross amounts set off on the balance sheet' discloses the amounts offset in accordance with all the criteria described in Note 1 "Significant Accounting Policies and Critical Accounting Estimates: Offsetting Financial Instruments".

The column 'Impact of Master Netting Agreements' discloses the amounts that are subject to master netting agreements but were not offset because they did not meet the net settlement/simultaneous settlement criteria; or because the rights of set off are conditional upon the default of the counterparty only. The amounts presented for other assets and other liabilities include cash margin receivables and payables respectively.

The columns 'Cash collateral' and 'Financial instrument collateral' disclose the cash and financial instrument collateral amounts received or pledged in relation to the total amounts of assets and liabilities, including those that were not offset.

Non-enforceable master netting agreements or similar agreements refer to contracts executed in jurisdictions where the rights of set off may not be upheld under the local bankruptcy laws.

The cash collateral received against the positive market values of derivatives and the cash collateral pledged towards the negative mark-to-market values of derivatives are booked within the 'Other liabilities' and 'Other assets' balances respectively.

The Cash and Financial instrument collateral amounts disclosed reflect their fair values. The rights of set off relating to the cash and financial instrument collateral are conditional upon the default of the counterparty.

18 – Loans

The entire loan book presented includes loans classified at amortized cost, loans at fair value through other comprehensive income and loans at fair value through profit and loss.

The below table gives an overview of the Group's loan exposure by industry, and is based on the NACE code of the counterparty. NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) is a standard European industry classification system.

Loans by industry classification

in € m.	Dec 31, 2022	Dec 31, 2021
Agriculture, forestry and fishing	526	647
Mining and quarrying	2,679	3,006
Manufacturing	32,352	36,820
Electricity, gas, steam and air conditioning supply	5,103	4,819
Water supply, sewerage, waste management and remediation activities	725	681
Construction	4,494	4,651
Wholesale and retail trade, repair of motor vehicles and motorcycles	22,605	22,444
Transport and storage	6,067	6,067
Accommodation and food service activities	1,972	2,272
Information and communication	7,783	7,387
Financial and insurance activities	121,333	111,239
Real estate activities	49,671	43,220
Professional, scientific and technical activities	7,137	7,022
Administrative and support service activities	7,922	10,324
Public administration and defense, compulsory social security	5,977	7,076
Education	249	225
Human health services and social work activities	4,554	4,005
Arts, entertainment and recreation	1,180	1,068
Other service activities	5,778	5,261
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	221,099	213,186
Activities of extraterritorial organizations and bodies	1	1
Gross loans	509,208	491,421
(Deferred expense)/unearned income	131	227
Loans less (deferred expense)/unearned income	509,077	491,194
Less: Allowance for loan losses	4,848	4,779
Total loans	504,229	486,416

19 – Allowance for Credit Losses

The allowance for credit losses consists of allowance for financial assets at amortized cost, financial assets at fair value through OCI and off-balance sheet lending commitments and guarantee business.

Development of allowance for credit losses for financial assets at amortized cost

in € m.	Dec 31, 2022				
	Allowance for Credit Losses ²				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI ⁴	Total
Balance, beginning of year	440	532	3,740	182	4,895
Movements in financial assets including new business and credit extensions	(32)	204	887	22	1,081
Transfers due to changes in creditworthiness	122	(121)	(0)	N/M	0
Changes due to modifications that did not result in derecognition	N/M	N/M	N/M	N/M	N/M
Changes in models	0	0	0	0	0
Financial assets that have been derecognized during the period ³	0	0	(1,014)	(28)	(1,043)
Recovery of written off amounts	0	0	68	3	71
Foreign exchange and other changes	2	12	(25)	1	(10)
Balance, end of reporting period	533	626	3,656	180	4,995
Provision for Credit Losses excluding country risk ¹	90	82	886	22	1,081

¹ Movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models add up to Provision for Credit Losses excluding country risk.

² Allowance for credit losses does not include allowance for country risk amounting to € 14 million as of December 31, 2022.

³ This position includes charge offs of allowance for credit losses.

⁴ The total amount of undiscounted expected credit losses at initial recognition on financial assets that are purchased or originated credit-impaired initially recognized during the reporting period was € 46 million in 2022 and € 0 million in 2021.

Development of allowance for credit losses for financial assets at amortized cost

in € m.	Dec 31, 2021				
	Allowance for Credit Losses ²				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI ⁴	Total
Balance, beginning of year	544	648	3,614	139	4,946
Movements in financial assets including new business and credit extensions	(245)	85	615	26	480
Transfers due to changes in creditworthiness	138	(197)	58	N/M	0
Changes due to modifications that did not result in derecognition	N/M	N/M	N/M	N/M	N/M
Changes in models	0	0	0	0	0
Financial assets that have been derecognized during the period ³	0	0	(561)	(5)	(566)
Recovery of written off amounts	0	0	55	23	78
Foreign exchange and other changes	3	(4)	(41)	(0)	(43)
Balance, end of reporting period	440	532	3,740	182	4,895
Provision for Credit Losses excluding country risk ¹	(107)	(112)	673	26	480

¹ Movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models add up to Provision for Credit Losses excluding country risk.

² Allowance for credit losses does not include allowance for country risk amounting to € 4 million as of December 31, 2021.

³ This position includes charge offs of allowance for credit losses.

⁴ The total amount of undiscounted expected credit losses at initial recognition on financial assets that are purchased or originated credit-impaired initially recognized during the reporting period was € 0 million in 2021 and € 46 million in 2020 (Prior year's comparatives aligned to presentation in the current year).

Development of allowance for credit losses for financial assets at amortized cost

in € m.	Dec 31, 2020				
	Allowance for Credit Losses ²				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI ⁴	Total
Balance, beginning of year	549	492	3,015	36	4,093
Movements in financial assets including new business and credit extensions	(44)	309	1,348	72	1,686
Transfers due to changes in creditworthiness	77	(125)	49		0
Changes due to modifications that did not result in derecognition	N/M	N/M	N/M	N/M	N/M
Changes in models	0	0	0	0	0
Financial assets that have been derecognized during the period ³	0	0	(781)	0	(781)
Recovery of written off amounts	0	0	58	0	58
Foreign exchange and other changes	(38)	(28)	(75)	31	(110)
Balance, end of reporting period	544	648	3,614	139	4,946
Provision for Credit Losses excluding country risk ¹	33	184	1,397	72	1,686

¹ Movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models add up to Provision for Credit Losses excluding country risk.

² Allowance for credit losses does not include allowance for country risk amounting to € 5 million as of December 31, 2020.

³ This position includes charge offs of allowance for credit losses.

⁴ The total amount of undiscounted expected credit losses at initial recognition on financial assets that are purchased or originated credit-impaired initially recognized during the reporting period was € 46 million in 2020 (Prior year's comparatives aligned to presentation in the current year).

Allowance for credit losses for financial assets at fair value through OCI¹

Dec 31, 2022					
in € m.	Allowance for Credit Losses				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Fair Value through OCI	14	12	43	0	69

¹ Allowance for credit losses against financial assets at fair value through OCI remained at very low levels (€ 41 million at December 31, 2021 and € 69 million as of December 31, 2022). Due to immateriality, we do not provide any details on the year-over-year development.

Dec 31, 2021					
in € m.	Allowance for Credit Losses				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Fair Value through OCI	15	10	16	0	41

¹ Allowance for credit losses against financial assets at fair value through OCI were almost unchanged at very low levels (€ 20 million at December 31, 2020 and € 41 million as of December 31, 2021). Due to immateriality, we do not provide any details on the year-over-year development.

Dec 31, 2020					
in € m.	Allowance for Credit Losses				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Fair Value through OCI	12	6	2	0	20

¹ Allowance for credit losses against financial assets at fair value through OCI were almost unchanged at very low levels (€ 35 million at December 31, 2019 and € 20 million as of December 31, 2020, respectively). Due to immateriality, we do not provide any details on the year-over-year development.

Development of allowance for credit losses for off-balance sheet positions

Dec 31, 2022					
in € m.	Allowance for Credit Losses ²				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	108	111	225	0	443
Movements including new business	21	(1)	78	0	99
Transfers due to changes in creditworthiness	12	(15)	3	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	4	3	3	0	9
Balance, end of reporting period	144	97	310	0	551
of which: Financial guarantees	95	56	226	0	378
Provision for Credit Losses excluding country risk ¹	33	(16)	82	0	99

¹ The above table breaks down the impact on provision for credit losses from movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models.

² Allowance for credit losses does not include allowance for country risk amounting to € 9 million as of December 31, 2022.

Development of allowance for credit losses for off-balance sheet positions

Dec 31, 2021					
in € m.	Allowance for Credit Losses ²				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	144	74	200	0	419
Movements including new business	(43)	38	18	0	13
Transfers due to changes in creditworthiness	3	(5)	2	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	3	3	6	0	12
Balance, end of reporting period	108	111	225	0	443
of which: Financial guarantees	69	64	164	0	297
Provision for Credit Losses excluding country risk ¹	(40)	33	19	0	13

¹ The above table breaks down the impact on provision for credit losses from movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models.

² Allowance for credit losses does not include allowance for country risk amounting to € 6 million as of December 31, 2021.

Development of allowance for credit losses for off-balance sheet positions

Dec 31, 2020					
in € m.	Allowance for Credit Losses ²				
	Stage 1	Stage 2	Stage 3	Stage 3 POCI	Total
Balance, beginning of year	128	48	166	0	342
Movements including new business	13	21	41	0	75
Transfers due to changes in creditworthiness	0	0	(1)	0	0
Changes in models	0	0	0	0	0
Foreign exchange and other changes	3	4	(6)	0	1
Balance, end of reporting period	144	74	200	0	419
of which: Financial guarantees	99	43	115	0	257
Provision for Credit Losses excluding country risk ¹	13	22	40	0	75

¹ The above table breaks down the impact on provision for credit losses from movements in financial assets including new business, transfers due to changes in creditworthiness and changes in models.

² Allowance for credit losses does not include allowance for country risk amounting to € 4 million as of December 31, 2020.

20 – Transfer of Financial Assets, Assets Pledged and Received as Collateral

The Group enters into transactions in which it transfers financial assets held on the balance sheet and as a result may either be eligible to derecognize the transferred asset in its entirety or must continue to recognize the transferred asset to the extent of any continuing involvement, depending on certain criteria. These criteria are discussed in Note 1 “Significant Accounting Policies and Critical Accounting Estimates”.

Where financial assets are not eligible to be derecognized, the transfers are viewed as secured financing transactions, with any consideration received resulting in a corresponding liability. The Group is not entitled to use these financial assets for any other purposes. The most common transactions of this nature entered into by the Group are repurchase agreements, securities lending agreements and total return swaps, in which the Group retains substantially all of the associated credit, equity price, interest rate and foreign exchange risks and rewards associated with the assets as well as the associated income streams.

Information on asset types and associated transactions that did not qualify for derecognition

in € m.	Dec 31, 2022	Dec 31, 2021
Carrying amount of transferred assets		
Trading securities not derecognized due to the following transactions:		
Repurchase agreements	30,201	44,898
Securities lending agreements	8,313	5,444
Total return swaps	1,461	1,766
Other	4,480	4,028
Total trading securities	44,455	56,136
Other trading assets	171	244
Non-trading financial assets mandatory at fair value through profit or loss	1,077	760
Financial assets at fair value through other comprehensive income	2,351	5,642
Loans at amortized cost ¹	104	13
Others	3,815	481
Total	51,973	63,276
Carrying amount of associated liabilities	43,820	57,522

¹ Loans where the associated liability is recourse only to the transferred assets had NIL carrying value and fair value as at December 31, 2022 and December 31, 2021. The associated liabilities had the same carrying value and fair value which resulted in a net position of 0.

Carrying value of assets transferred to the Group has continuing involvement

in € m.	Dec 31, 2022	Dec 31, 2021
Carrying amount of the original assets transferred		
Trading securities	1,059	1,050
Non-trading financial assets mandatory at fair value through profit or loss	328	308
Carrying amount of the assets continued to be recognized		
Trading securities	34	61
Non-trading financial assets mandatory at fair value through profit or loss	16	15
Carrying amount of associated liabilities	95	102

The Group could retain some exposure to the future performance of a transferred asset either through new or existing contractual rights and obligations and still be eligible to derecognize the asset. This ongoing involvement will be recognized as a new instrument which may be different from the original financial asset that was transferred. Typical transactions include retaining senior notes of non-consolidated securitizations to which originated loans have been transferred; financing arrangements with structured entities to which the Group has sold a portfolio of assets; or sales of assets with credit-contingent swaps. The Group's exposure to such transactions is not considered to be significant as any substantial retention of risks associated with the transferred asset will commonly result in an initial failure to derecognize. Transactions not considered to result in an ongoing involvement include normal warranties on fraudulent activities that could invalidate a transfer in the event of legal action, qualifying pass-through arrangements and standard trustee or administrative fees that are not linked to performance.

The impact on the Group's Balance Sheet of on-going involvement associated with transferred assets derecognized in full

in € m.	Dec 31, 2022			Dec 31, 2021		
	Carrying value	Fair value	Maximum Exposure to Loss ¹	Carrying value	Fair value	Maximum Exposure to Loss ¹
Loans at amortized cost						
Securitization notes	357	321	321	283	302	302
Other	0	0	0	0	0	0
Total loans at amortized cost	357	321	321	283	302	302
Financial assets held at fair value through profit or loss						
Securitization notes	30	30	30	29	29	29
Non-standard Interest Rate, cross-currency or inflation-linked swap	0	0	0	465	465	465
Total financial assets held at fair value through profit or loss	30	30	30	494	494	494
Financial assets at fair value through other comprehensive income:						
Securitization notes	739	629	629	709	713	713
Other	0	0	0	0	0	0
Total financial assets at fair value through other comprehensive income	739	629	629	709	713	713
Total financial assets representing on-going involvement	1,126	981	981	1,486	1,509	1,509
Financial liabilities held at fair value through profit or loss						
Non-standard Interest Rate, cross-currency or inflation-linked swap	0	0	0	8	8	0
Total financial liabilities representing on-going involvement	0	0	0	8	8	0

¹ The maximum exposure to loss is defined as the carrying value plus the notional value of any undrawn loan commitments not recognized as liabilities.

The impact on the Group's Statement of Income of on-going involvement associated with transferred assets derecognized in full

in € m.	Dec 31, 2022			Dec 31, 2021		
	Year-to-date P&L	Cumulative P&L	Gain/(loss) on disposal	Year-to-date P&L	Cumulative P&L	Gain/(loss) on disposal
Securitization notes	41	112	(8)	30	81	48
Non-standard Interest Rate, cross-currency or inflation-linked swap	(0)	(0)	0	41	41	0
Net gains/(losses) recognized from on-going involvement in derecognized assets	40	112	(8)	72	123	48

The Group pledges assets primarily as collateral against secured funding and for repurchase agreements, securities borrowing agreements as well as other borrowing arrangements and for margining purposes on OTC derivative liabilities. Pledges are generally conducted under terms that are usual and customary for standard securitized borrowing contracts and other transactions described. As at December 31, 2022 the bank had securitized loans of € 28 billion and the secured own bonds were pledged as collateral into the ECBs TLTRO program or market standard securities financing transactions. The encumbered loans below includes this balances.

Carrying value of the Group's assets pledged as collateral for liabilities or contingent liabilities¹

in € m.	Dec 31, 2022	Dec 31, 2021
Financial assets at fair value through profit or loss	37,216	51,165
Financial assets at fair value through other comprehensive income	2,375	6,395
Loans	73,305	79,485
Other	5,306	611
Total	118,202	137,656

¹ Excludes assets pledged as collateral from transactions that do not result in liabilities or contingent liabilities.

Total assets pledged to creditors available for sale or repledge¹

in € m.	Dec 31, 2022	Dec 31, 2021
Financial assets at fair value through profit or loss	40,997	48,426
Financial assets at fair value through other comprehensive income	1,408	5,252
Loans	2,716	2,073
Other	593	481
Total	45,715	56,233

¹ Includes assets pledged as collateral from transactions that do not result in liabilities or contingent liabilities.

The Group receives collateral primarily in reverse repurchase agreements, securities lending agreements, derivatives transactions, customer margin loans and other transactions. These transactions are generally conducted under terms that are usual and customary for standard secured lending activities and the other transactions described. The Group, as the secured party, has the right to sell or re-pledge such collateral, subject to the Group returning equivalent securities upon completion of the transaction. This right is used primarily to cover short sales, securities loaned and securities sold under repurchase agreements.

Fair Value of collateral received

in € m.	Dec 31, 2022	Dec 31, 2021
Securities and other financial assets accepted as collateral	309,107	260,003
Of which:		
Collateral sold or repledged	254,856	222,232

21 – Property and Equipment

in € m.	Owner occupied properties	Furniture and equipment	Leasehold improvements	Construction-in-progress	Property and equipment owned (IAS 16)	Right-of-use for leased assets (IFRS 16)	Total
Cost of acquisition:							
Balance as of January 1, 2021	587	2,343	2,897	387	6,214	4,844	11,058
Changes in the group of consolidated companies	(1)	0	0	0	(1)	0	(1)
Additions	0	113	46	391	550	254	804
Transfers	58	(8)	354	(321)	83	367	451
Reclassifications (to)/from "held for sale"	(131)	(16)	(94)	(1)	(241)	0	(241)
Disposals	0	187	146	79	412	165	578
Exchange rate changes	1	38	45	21	105	139	244
Balance as of December 31, 2021	514	2,283	3,102	398	6,297	5,439	11,737
Changes in the group of consolidated companies	0	0	0	0	0	0	0
Additions	0	94	65	178	337	971	1,308
Transfers	0	109	362	(377)	94	78	171
Reclassifications (to)/from "held for sale"	0	(7)	(12)	0	(19)	(0)	(19)
Disposals	11	72	35	0	118	417	535
Exchange rate changes	(1)	27	42	16	84	117	201
Balance as of December 31, 2022	503	2,434	3,523	216	6,676	6,187	12,863
Accumulated depreciation and impairment:							
Balance as of January 1, 2021	317	1,856	1,989	0	4,163	1,347	5,510
Changes in the group of consolidated companies	(1)	0	0	0	(1)	0	(1)
Depreciation	16	140	204	0	360	631	991
Impairment losses	12	7	39	1	59	99	158
Reversals of impairment losses	0	0	0	0	0	18	18
Transfers	57	16	10	0	84	2	85
Reclassifications (to)/from "held for sale"	(115)	(15)	(62)	0	(191)	0	(191)
Disposals	0	178	125	0	303	133	436
Exchange rate changes	1	34	39	0	74	29	103
Balance as of December 31, 2021	288	1,860	2,095	1	4,244	1,957	6,201
Changes in the group of consolidated companies	0	0	0	0	0	0	0
Depreciation	13	141	194	0	348	573	922
Impairment losses	1	0	4	0	4	6	11
Reversals of impairment losses	4	0	0	0	4	17	21
Transfers	0	61	24	0	86	3	89
Reclassifications (to)/from "held for sale"	0	(6)	(9)	0	(15)	0	(15)
Disposals	11	55	28	0	93	393	486
Exchange rate changes	(1)	20	24	0	43	17	60
Balance as of December 31, 2022	286	2,022	2,304	1	4,613	2,147	6,760
Carrying amount:							
Balance as of December 31, 2021	226	423	1,007	398	2,054	3,482	5,536
Balance as of December 31, 2022	217	412	1,219	215	2,063	4,040	6,103

Depreciation expenses, impairment losses and reversal of impairment losses on property and equipment are recorded within general and administrative expenses for the income statement.

The carrying value of items of property and equipment on which there is a restriction on sale was € 25 million and € 22 million as of December 31, 2022 and December 31, 2021, respectively.

Commitments for the acquisition of property and equipment were € 150 million at year-end 2022 and € 35 million at year-end 2021.

The Group leases many assets including land and buildings, vehicles and IT equipment for which it records right-of-use assets. During 2022, additions to right-of-use assets amounted to € 971 million and largely reflected new real estate leases. Depreciation charges of € 573 million recognized in 2022 mainly resulted from planned consumption of right-of-use assets for property leases over their contractual terms. The carrying amount of right-of-use assets of € 4.0 billion included in Total Property and equipment as of December 31, 2022 predominantly represented leased properties of € 4.0 billion and vehicle leases of € 10 million. For more information on the Group's leased properties and related disclosures required under IFRS 16, please refer to Note 22 "Leases".

22 – Leases

The Group's disclosures are as a lessee under lease arrangements covering property and equipment. The Group has applied judgement in presenting related information pursuant to IFRS 16 in a manner that it considers to be most relevant to an understanding of its financial performance and position.

The Group leases many assets including land and buildings, vehicles and IT equipment. The Group is a lessee for the majority of its offices and branches under long-term rental agreements. Most of the lease contracts are made under usual terms and conditions, which means they include options to extend the lease by a defined amount of time, price adjustment clauses and escalation clauses in line with general office rental market conditions. However, the lease agreements do not include any clauses that impose any restriction on the Group's ability to pay dividends, engage in debt financing transactions or enter into further lease agreements.

As of December 31, 2022 (December 31, 2021), the Group recorded right-of-use assets on its balance sheet with a carrying amount of € 4.0 billion (€ 3.5 billion), which are included in Property and equipment. The right-of-use assets predominantly represented leased properties of € 4.0 billion (€ 3.5 billion) and vehicle leases of € 10 million (€ 11 million). For more information on the year-to-date development of right-of-use assets, please refer to Note 21 "Property and Equipment".

Corresponding to the recognition of the right-of-use assets, as of December 31, 2022 (December 31, 2021), the Group recorded lease liabilities on its balance sheet with a carrying amount of € 4.5 billion (€ 4.0 billion), which are included in Other liabilities. As of December 31, 2022, the lease liabilities included the discounted value of future lease payments of € 488 million for the Group headquarters in Frankfurt am Main that was sold and leased back on December 1, 2011. The contract was extended in the fourth quarter 2021 with a fixed term until the end of 2036 and includes two options to extend the lease for two additional 5-year periods up to the end of 2046.

During 2022 and 2021, interest expenses recorded from the compounding of the lease liabilities amounted to € 85 million and € 86 million, respectively. The contractual maturities for the undiscounted cash flows from these liabilities are shown in Note 31 "Maturity Analysis of the earliest contractual undiscounted cash flows of Financial Liabilities".

Expenses recognized in 2022 (2021) relating to short-term leases and leases of low-value assets, for which the Group decided to apply the recognition exemption under IFRS 16 (and thus not to record right-of-use assets and corresponding lease liabilities on the balance sheet), amounted to € 1 million (€ 2 million) and € 0 million (€ 0 million), respectively.

Income recorded in 2022 (2021) from the subletting of right-of-use assets totaled € 29 million (€ 34 million).

The total cash outflow for leases for 2022 (2021) was € 691 million (€ 767 million) and represented mainly expenditures made for real estate rentals over € 683 million (€ 754 million). Of the total cash outflow amount, payments of € 607 million (€ 679 million) were made for the principal portion of lease liabilities, payments of € 84 million (€ 87 million) were made for the interest portion.

Total future cash outflows to which the Group as a lessee is potentially exposed, that are not reflected in the measurement of the lease liabilities, mainly include potential payment exposures arising from extension options (2022: € 5.7 billion) and future payments for leases not yet commenced, but to which the Group is committed (2022: € 155 million). Their expected maturities are shown in the table below.

Future cash outflows to which the Group is potentially exposed that are not reflected in the measurement of lease liabilities

in € m.	Dec 31, 2022	Dec 31, 2021
Future cash outflows not reflected in lease liabilities:		
Not later than one year	14	10
Later than one year and not later than five years	613	539
Later than five years	5,226	5,849
Future cash outflows not reflected in lease liabilities	5,852	6,398

23 – Goodwill and Other Intangible Assets

Goodwill

Changes in Goodwill

The changes in the carrying amount of goodwill, as well as gross amounts and accumulated impairment losses of goodwill, for the years ended December 31, 2022, and December 31, 2021, are shown below by cash-generating units ("CGU").

The Group's business operations are organized under the following divisional structure: the Core Bank, which includes the Corporate Bank, Investment Bank, Private Bank and Asset Management corporate divisions and the Capital Release Unit. The corporate divisions as well as the Capital Release Unit each are considered CGUs.

Please also refer to Note 4 "Business Segments and Related Information" for more information regarding changes in the presentation of segment disclosures.

Goodwill allocated to cash-generating units

in € m.	Investment Bank	Corporate Bank	Asset Management	Private Bank	Total
Balance as of January 1, 2021	0	0	2,739	0	2,739
Goodwill acquired during the year	0	5	0	0	5
Purchase accounting adjustments	0	0	0	0	0
Transfers	0	0	0	0	0
Reclassification from (to) "held for sale"	0	0	(56)	0	(56)
Goodwill related to dispositions without being classified as "held for sale"	0	0	0	0	0
Impairment losses ¹	0	(5)	0	0	(5)
Exchange rate changes/other	0	0	123	0	123
Balance as of December 31, 2021	0	0	2,806	0	2,806
Gross amount of goodwill	3,854	602	3,295	3,716	11,467
Accumulated impairment losses	(3,854)	(602)	(489)	(3,716)	(8,662)
Balance as of January 1, 2022	0	0	2,806	0	2,806
Goodwill acquired during the year	0	0	0	0	0
Purchase accounting adjustments	0	0	0	0	0
Transfers	0	0	0	0	0
Reclassification from (to) "held for sale"	0	0	0	0	0
Goodwill related to dispositions without being classified as "held for sale"	0	0	0	0	0
Impairment losses ¹	0	0	0	0	0
Exchange rate changes/other	0	0	113	0	113
Balance as of December 31, 2022	0	0	2,919	0	2,919
Gross amount of goodwill	4,079	629	3,408	3,717	11,834
Accumulated impairment losses	(4,079)	(629)	(489)	(3,717)	(8,915)

¹ Impairment losses of goodwill are recorded as impairment of goodwill and other intangible assets in the income statement.

Changes in goodwill in 2022 only included foreign exchange rate movements of Asset Management goodwill held in non-Group currencies.

Changes in goodwill in 2021 related to the reclassification of € 56 million of Asset Management goodwill to assets held for sale, following the designated sale of DWS' digital investment platform to a joint venture with BlackFin (see Note 24) and foreign exchange rate movements. Following the acquisition of a payment service provider (Better Payment Germany GmbH) in September 2021 (see Note 3), as part of the purchase price allocation the Group had initially recorded goodwill of € 5 million assigned to the Corporate Bank CGU. Given the valuation of the CGU continued to have a shortfall of its recoverable amount versus its carrying amount, the newly acquired goodwill was considered impaired and fully written off in 2021.

Changes in goodwill in 2020 solely related to foreign exchange rate movements of Asset Management goodwill held in non-Group currencies.

Goodwill Impairment Test

For the purposes of impairment testing, goodwill acquired in a business combination is allocated to the appropriate CGU on the basis as described in Note 1 "Significant Accounting Policies and Critical Accounting Estimates". The Group's primary CGUs are as outlined above. Asset Management's goodwill is tested for impairment annually in the fourth quarter by comparing the recoverable amount of the CGU with its carrying amount. In addition, the Group tests goodwill whenever a triggering event is identified. The recoverable amount is the higher of a CGU's fair value less costs of disposal and its value in use. The Asset Management CGU was the only goodwill carrying CGU to be tested for annual impairment in 2020, 2021 and 2022. The impairment tests conducted on Asset Management in these periods did not result in an impairment loss as the recoverable amounts of the Asset Management CGU was higher than the respective carrying amounts.

A review of the Group's strategy or certain political or global risks for the banking industry, uncertainties regarding the implementation of already adopted regulation and the introduction of legislation that is already under discussion could result in an impairment of goodwill in the future.

Carrying Amount

The carrying amount of a primary CGU is derived using a capital allocation model based on the Shareholders' Equity Allocation Framework of the Group (please refer to Note 4, "Business Segments and Related Information" for more details). The allocation uses the Group's total equity at the date of valuation, including Additional Tier 1 Notes ("AT1 Notes"), which constitute unsecured and subordinated notes of Deutsche Bank and which are classified as additional equity components in accordance with IFRS. Total equity is adjusted for an add-on adjustment for goodwill attributable to noncontrolling interests.

Recoverable Amount

The Group determines the recoverable amounts of its primary CGUs on the basis of the higher of value in use and fair value less costs of disposal (Level 3 of the fair value hierarchy). It employs a discounted cash flow (DCF) model, which reflects the specifics of the banking business and its regulatory environment. The model calculates the present value of the estimated future earnings that are distributable to shareholders after fulfilling the respective regulatory capital requirements. The recoverable amounts also include the fair value of the AT1 Notes, which are allocated to the primary CGUs.

The DCF model uses earnings projections and respective capitalization assumptions based on five-year financial plans as well as longer term expectations on the impact of regulatory developments, which are discounted to their present value. Estimating future earnings and capital requirements involves judgment and the consideration of past and current performances as well as expected developments in the respective markets, and in the overall macroeconomic and regulatory environments. Earnings projections beyond the initial five-year period are, where applicable, adjusted to derive a sustainable level. In case of a going concern, the cash flow to equity is assumed to increase by or converge towards a constant long-term growth rate for the Asset Management CGU of up to 3.0 % (2021: up to 2.7 %). This is based on projected revenue forecasts of the CGU as well as expectations for the development of gross domestic product and inflation and is captured in the terminal value.

Key Assumptions and Sensitivities

Key Assumptions: The DCF value of a CGU is sensitive to the earnings projections, to the discount rate (cost of equity) applied and, to a lesser extent, to the long-term growth rate. The discount rates applied have been determined based on the capital asset pricing model and comprise a risk-free interest rate, a market risk premium and a factor covering the systematic market risk (beta factor). The values for the risk-free interest rate, the market risk premium and the beta factors are determined using external sources of information. CGU-specific beta factors are determined based on a respective group of peer companies. Variations in all of these components might impact the discount rates. For the Asset Management CGU, the discount rates (after tax) applied for 2022 and 2021 were 10.3 % and 9.1 %, respectively.

Management determined the values for the key assumptions in the following table based on a combination of internal and external analysis. Estimates for efficiency and the cost reduction program are based on progress made to date and scheduled future projects and initiatives.

Key management assumptions are:

Primary goodwill-carrying cash-generating unit	Description of key assumptions	Uncertainty associated with key assumptions and potential events/circumstances that could have a negative effect
Asset Management	— Maintaining leadership in mature markets (e.g., Equity, Multi-Asset and Fixed income)	— Challenging market environment and volatility unfavorable to its investment strategies
	— Expanding true areas of strength like Xtrackers and Alternatives	— Unfavorable margin development and adverse competition levels in key markets and products beyond expected levels
	— Further build out digital capabilities	
	— Expand distribution partnerships to expand its global business and reach a higher-margin wholesale segment	— Business/execution risks, e.g., underachievement of net flow targets from market uncertainty, loss of high-quality client facing employees, unfavorable investment performance, lower than expected efficiency gains
	— Standalone operating and governance model while leveraging divisional capabilities	— Uncertainty around regulation and its potential implications not yet anticipated

Sensitivities: In order to test the resilience of the recoverable amount, key assumptions used in the DCF model (for example, the discount rate and the earnings projections) are sensitized. Currently, in Asset Management the recoverable amount exceeds the carrying amount by 14 % / € 1.0 billion.

Change in certain key assumptions to cause the recoverable amount to equal the carrying amount

Change in Key Assumptions	Asset Management
Discount rate (post tax) increase	
from	10.3 %
to	11.3 %
Change in projected future earnings in each period by	11.0 %
Long term growth rate	
from	3.0 %
to	1.1 %

Other Intangible Assets

Changes of other intangible assets by asset classes for the years ended December 31, 2022 and December 31, 2021

in € m.	Purchased intangible assets							Internally generated intangible assets	Total other intangible assets
	Unamortized		Amortized					Amortized	
	Retail investment management agreements	Other	Total unamortized purchased intangible assets	Customer-related intangible assets	Contract-based intangible assets	Software and other	Total amortized purchased intangible assets	Software	
Cost of acquisition/ manufacture:									
Balance as of January 1, 2021	945	441	1,386	1,356	70	778	2,204	7,910	11,499
Additions	0	0	0	13	0	22	35	1,106	1,141
Changes in the group of consolidated companies	0	0	0	0	0	0	0	5	4
Disposals	0	0	0	0	0	12	12	86	98
Reclassifications from (to) "held for sale"	0	0	0	0	0	0	0	(40)	(40)
Transfers	0	0	0	(5)	0	0	(5)	(1)	(6)
Exchange rate changes	71	1	72	34	0	1	35	125	231
Balance as of December 31, 2021	1,017	440	1,457	1,398	70	789	2,257	9,018	12,732
Additions	0	0	0	0	0	45	45	1,145	1,191
Changes in the group of consolidated companies	0	0	0	0	0	(6)	(6)	(20)	(26)
Disposals	0	0	0	0	0	37	37	122	160
Reclassifications from (to) "held for sale"	0	0	0	0	0	0	0	(32)	(32)
Transfers	0	0	0	(9)	0	0	(9)	0	(9)
Exchange rate changes	67	0	67	32	0	0	32	128	226
Balance as of December 31, 2022	1,083	441	1,524	1,421	70	792	2,283	10,116	13,923
Accumulated amortization and impairment:									
Balance as of January 1, 2021	239	439	678	1,340	70	633	2,043	4,793	7,513
Amortization for the year	0	0	0	6	0	37	43	974	1,017 ¹
Changes in the group of consolidated companies	0	0	0	0	0	0	0	0	(1)
Disposals	0	0	0	0	0	12	12	85	97
Reclassifications from (to) "held for sale"	0	0	0	0	0	0	0	(9)	(9)
Impairment losses	0	0	0	3	0	0	3	149	152 ²
Reversals of impairment losses	0	0	0	0	0	0	0	0	0
Transfers	0	0	0	0	0	3	3	0	2
Exchange rate changes	18	0	18	34	0	1	35	83	136
Balance as of December 31, 2021	257	439	696	1,383	70	662	2,115	5,904	8,714
Amortization for the year	0	0	0	3	0	37	40	980	1,020 ³
Changes in the group of consolidated companies	0	0	0	0	0	(6)	(6)	(20)	(26)
Disposals	0	0	0	0	0	35	35	122	157
Reclassifications from (to) "held for sale"	0	0	0	0	0	0	0	(25)	(25)
Impairment losses	68	0	68	0	0	0	0	30	98 ⁴
Reversals of impairment losses	0	0	0	3	0	0	3	0	3 ⁵
Transfers	0	0	0	3	0	0	3	0	3
Exchange rate changes	17	0	17	31	0	0	31	78	126
Balance as of December 31, 2022	342	439	781	1,417	70	659	2,146	6,824	9,750
Carrying amount:									
As of December 31, 2021	760	1	761	15	0	128	143	3,114	4,018
As of December 31, 2022	741	2	743	4	0	133	137	3,293	4,173

¹ € 1.0 billion were included in general and administrative expenses.

² € 152 million were comprised of impairments of € 149 million on self-developed software and of € 3 million on customer-related intangibles, both recorded in general and administrative expenses.

³ € 1.0 billion were included in general and administrative expenses.

⁴ € 98 million were comprised of impairments on retail investment management agreements recorded in impairment of goodwill and other intangible assets of € 68 million and of € 30 million on self-developed software recorded in general and administrative expenses.

⁵ € 3 million were a reversal of impairment losses on customer-related intangibles recorded in general and administrative expenses.

Amortizing Intangible Assets

In 2022, amortizing intangible assets increased by net € 173 million. This includes amortization expenses of € 1.0 billion, mostly for the scheduled consumption of capitalized software (€ 1.0 billion) and the impairment of current platform software as well as software under construction (€ 30 million). Additions to internally generated intangible assets of € 1.1 billion resulting from the capitalization of expenses incurred in conjunction with the Group's development of own-used software overcompensated the negative impact from amortization and impairment charges on net book value. A weaker Euro exchange rate against major currencies accounted for net positive exchange rate changes of € 50 million.

In 2021, amortizing other intangible assets remained nearly unchanged, decreasing only slightly by net € 21 million. This reflects amortization expenses of € 1.0 billion, mostly for the scheduled consumption of capitalized software (€ 1.0 billion) and the impairment of current platform software as well as software under construction (€ 149 million). Additions to internally generated intangible assets of € 1.1 billion resulting from the capitalization of expenses incurred in conjunction with the Group's development of own-used software compensated for the decrease in net book value. A weaker Euro exchange rate against major currencies accounted for positive exchange rate changes of € 42 million.

In 2020, amortizing other intangible assets decreased by € 161 million. This reduction was driven by amortization expenses of € 1.0 billion, mostly for the scheduled consumption of capitalized software (€ 1.0 billion) and the impairment of current platform software as well as software under construction (€ 50 million). Additions to internally generated intangible assets of € 1.1 billion resulting from the capitalization of expenses incurred in conjunction with the Group's development of own-used software compensated for the decrease in net book value. A stronger Euro exchange rate against major currencies accounted for negative exchange rate changes of € 112 million.

Other intangible assets with finite useful lives are generally amortized over their useful lives based on the straight-line method.

Useful lives of other amortized intangible assets by asset class

	Useful lives in years
Internally generated intangible assets:	
Software	up to 10
Purchased intangible assets:	
Customer-related intangible assets	up to 20
Other	up to 10

Unamortized Intangible Assets

Within this asset class, the Group recognizes certain contract-based and marketing-related intangible assets, which are deemed to have an indefinite useful life.

In particular, the asset class comprises the below detailed investment management agreements related to retail mutual funds and certain trademarks. Due to the specific nature of these intangible assets, market prices are ordinarily not observable and, therefore, the Group values such assets based on the income approach, using a post-tax DCF-methodology.

Retail investment management agreements: These assets, amounting to € 741 million, relate to the Group's U.S. retail mutual fund business and are allocated to the Asset Management CGU. Retail investment management agreements are contracts that give Asset Management the exclusive right to manage a variety of mutual funds for a specified period. Since these contracts are easily renewable at minimal cost, these agreements are not expected to have a foreseeable limit on the contract period. Therefore, the rights to manage the associated assets under management are expected to generate cash flows for an indefinite period of time. This intangible asset was recorded at fair value based upon a valuation provided by a third party at the date of acquisition of Zurich Scudder Investments, Inc. in 2002.

The recoverable amount was calculated as fair value less costs of disposal using the multi-period excess earnings method and the fair value measurement was categorized as Level 3 in the fair value hierarchy. The key assumptions in determining the fair value less costs of disposal include the asset mix, the flows forecast, the effective fee rate and discount rate as well as the terminal value growth rate. The discount rate (cost of equity) applied in the annual impairment test was 10.6 % in 2022 (9.8 % in 2021). The terminal value growth rate applied for 2022 was 3.8 % (for 2021 4.1 %). The annual review of the valuation neither resulted in any impairment nor reversal of prior impairments (2021 respectively).

Due to net outflows and change in the discount rate to 10.9 % in the fourth quarter, this triggered an indication of impairment and the impairment test was reassessed at year-end. The reassessment resulted in an impairment loss of € 68 million recognized in the Group's income statement within impairment of goodwill and other intangible assets.

24 – Non-Current Assets and Disposal Groups Held for Sale

Within the balance sheet, non-current assets and disposal groups held for sale are included in other assets and other liabilities.

in € m.	Dec 31, 2022	Dec 31, 2021
Cash and bank balances	0	6
Loans, net	40	0
Property and equipment	0	9
Goodwill and other intangible assets	0	88
Other assets	0	296
Total assets classified as held for sale	40	398
Investment contract liabilities	208	0
Other liabilities	0	252
Total liabilities classified as held for sale	208	252

As of December 31, 2022, and December 31, 2021, no unrealized gains (losses) relating to non-current assets classified as held for sale were recognized directly in accumulated other comprehensive income (loss) (net of tax).

2022

DWS completes closing of transfer of its digital investment platform as part of its partnership with BlackFin

In September 2021, DWS Group ("DWS") and BlackFin Capital Partners ("BlackFin") had agreed on a long-term strategic partnership to jointly evolve the digital investment platform into a platform eco system that provides comprehensive solutions and services. It was agreed that DWS would transfer its digital investment platform into a joint venture with BlackFin, maintaining a stake of 30 %. The transaction to transfer the digital investment platform into the newly established company MorgenFund GmbH closed as of November 30, 2022. As part of the consideration, the Group received a 30 % stake in that company which is accounted for under the equity method and held in the Asset Management division.

Sale of the Italian financial advisors business to Zurich Italy

In August 2021, Deutsche Bank and Zurich Insurance Group Italy ("Zurich Italy") reached an agreement with Zurich Italy Bank S.p.A. to acquire Deutsche Bank's Financial Advisors business in Italy. Closing of the sale was announced on October 17, 2022. Under the terms of the agreement, a total of 1,085 Financial Advisors, 96 employees, and approximately € 16 billion in assets under management (of which € 1.0 billion Discretionary Portfolio Management still managed by Deutsche Bank) have passed to Zurich Bank Italy S.p.A. The pre-tax gain on sale totaled € 312 million and was recorded in the Private Bank segment results in the fourth quarter of 2022.

2021

Transfer of Global Prime Finance & Electronic Equities platform to BNP Paribas completed

As part of the Group's strategic transformation and restructuring plans announced in July 2019, Deutsche Bank had disclosed the exit of its Equities Sales & Trading business. In this context, Deutsche Bank entered into an agreement with BNP Paribas S.A. ("BNP Paribas") to transfer technology and staff to BNP Paribas and to continue to operate the platform until clients are migrated to BNP Paribas. The Group and BNP Paribas announced on January 5, 2022 that the transfer of clients, technology and key staff to BNP Paribas has been successfully completed by the end of 2021, in line with the targeted timeline.

25 – Other Assets and Other Liabilities

in € m.	Dec 31, 2022	Dec 31, 2021
Brokerage and securities related receivables		
Cash/margin receivables	50,394	48,675
Receivables from prime brokerage	4	5
Pending securities transactions past settlement date	2,385	3,579
Receivables from unsettled regular way trades	18,467	19,236
Total brokerage and securities related receivables	71,250	71,495
Debt Securities held to collect	25,500	14,800
Accrued interest receivable	3,588	2,084
Assets held for sale	40	398
Other	17,747	15,007
Total other assets	118,124	103,784

in € m.	Dec 31, 2022	Dec 31, 2021
Brokerage and securities related payables		
Cash/margin payables	62,824	52,875
Payables from prime brokerage	24	583
Pending securities transactions past settlement date	2,982	1,549
Payables from unsettled regular way trades	16,882	15,158
Total brokerage and securities related payables	82,711	70,165
Accrued interest payable	2,826	1,625
Liabilities held for sale	208	252
Lease liabilities	4,470	3,965
Other	23,434	21,788
Total other liabilities	113,648	97,795

For further details on the assets and liabilities held for sale, please refer to Note 24 "Non-Current Assets and Disposal Groups Held for Sale".

26 – Deposits

in € m.	Dec 31, 2022	Dec 31, 2021
Noninterest-bearing demand deposits	253,989	226,091
Interest-bearing deposits		
Demand deposits	131,726	167,807
Time deposits	158,851	122,478
Savings deposits	84,617	88,021
Total interest-bearing deposits	375,195	378,306
Total deposits	629,183	604,396

27 – Provisions

Movements by Class of Provisions

in € m.	Operational Risk	Civil Litigation	Regulatory Enforcement	Re-structuring	Other	Total ¹
Balance as of January 1, 2021	89	355	492	676	396	2,007
Changes in the group of consolidated companies	0	0	0	0	2	2
New provisions	62	475	110	302	641	1,590
Amounts used	2	112	113	339	470	1,036
Unused amounts reversed	106	78	40	58	151	434
Effects from exchange rate fluctuations/Unwind of discount	0	6	26	1	7	40
Transfers	(0)	(1)	0	(0)	24	22
Balance as of December 31, 2021	42	644	475	582	448	2,192
Changes in the group of consolidated companies	0	0	0	0	(0)	(0)
New provisions	14	285	290	3	653	1,246
Amounts used	3	136	216	201	582	1,138
Unused amounts reversed	8	166	0	137	110	421
Effects from exchange rate fluctuations/Unwind of discount	(0)	1	23	0	1	26
Transfers	0	(1)	(3)	1	(13)	(16)
Balance as of December 31, 2022	45	627	570	248	398	1,888

¹ For the remaining portion of provisions as disclosed on the consolidated balance sheet, please see Note 19 "Allowance for Credit Losses", in which allowances for credit related off-balance sheet positions are disclosed.

Classes of Provisions

Operational Risk Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. The definition used for the purposes of determining operational provisions differs from the risk management definition, as it excludes risk of loss resulting from civil litigation and regulatory enforcement matters. For risk management purposes, operational risk includes legal risk, as payments to customers, counterparties and regulatory bodies in civil litigations or regulatory enforcement matters constitute loss events for operational shortcomings, but excludes business and reputational risk.

Civil Litigation provisions arise out of current or potential claims or proceedings alleging non-compliance with contractual or other legal or regulatory responsibilities, which have resulted or may result in demands from customers, counterparties or other parties in civil litigations.

Regulatory Enforcement provisions arise out of current or potential claims or proceedings alleging non-compliance with legal or regulatory responsibilities, which have resulted or may result in an assessment of fines or penalties by governmental regulatory agencies, self-regulatory organizations or other enforcement authorities.

Restructuring provisions arise out of restructuring activities. The Group aims to enhance its long-term competitiveness through major reductions in costs, duplication and complexity in the years ahead. For details see Note 10 "Restructuring".

Other provisions include several specific items arising from a variety of different circumstances, including the provision for the reimbursement of loan processing fees, deferred sales commissions, provisions for bank levies and mortgage repurchase demands.

Provisions and Contingent Liabilities

The Group recognizes a provision for potential loss only when there is a present obligation arising from a past event that is probable to result in an economic outflow that can be reliably estimated. Where a reliable estimate cannot be made for such an obligation, no provision is recognized and the obligation is deemed a contingent liability. Contingent liabilities also include possible obligations for which the possibility of future economic outflow is more than remote but less than probable. Where a provision has been taken for a particular claim, no contingent liability is recorded; for matters or sets of matters consisting of more than one claim, however, provisions may be recorded for some claims, and contingent liabilities (or neither a provision nor a contingent liability) may be recorded for others.

The Group operates in a legal and regulatory environment that exposes it to significant litigation risks. As a result, the Group is involved in litigation, arbitration and regulatory proceedings and investigations in Germany and in a number of jurisdictions outside Germany, including the United States. In recent years, regulation and supervision in a number of areas have increased, and regulators, governmental bodies and others have sought to subject financial services providers to increasing oversight and scrutiny, which in turn has led to additional regulatory investigations and enforcement actions which are often followed by civil litigation.

In determining for which of the claims the possibility of a loss is probable, or less than probable but more than remote, and then estimating the possible loss for those claims, the Group takes into consideration a number of factors, including but not limited to the nature of the claim and its underlying facts, the procedural posture and litigation history of each case, rulings by the courts or tribunals, the Group's experience and the experience of others in similar cases (to the extent this is known to the Group), prior settlement discussions, settlements by others in similar cases (to the extent this is known to the Group), available indemnities and the opinions and views of legal counsel and other experts.

The provisions the Group has recognized for civil litigation and regulatory enforcement matters as of December 31, 2022 and December 31, 2021 are set forth in the table above. For some matters no provision was recognized when the Group believes an outflow of funds is probable, but the Group could not reliably estimate the amount of the potential outflow.

For the matters for which a reliable estimate can be made, the Group currently estimates that, as of December 31, 2022, the aggregate future loss of which the possibility is more than remote but less than probable is approximately € 1.8 billion for civil litigation matters (December 31, 2021: € 1.7 billion) and € 0.1 billion for regulatory enforcement matters (December 31, 2021: € 0.1 billion). These figures include matters where the Group's potential liability is joint and several and where the Group expects any such liability to be paid by a third party. For other significant civil litigation and regulatory enforcement matters, the Group believes the possibility of an outflow of funds is more than remote but less than probable but the amount is not reliably estimable, and accordingly such matters are not included in the contingent liability estimates. For still other significant civil litigation and regulatory enforcement matters, the Group believes the possibility of an outflow of funds is remote and therefore has neither recognized a provision nor included them in the contingent liability estimates.

This estimated possible loss, as well as any provisions taken, is based upon currently available information and is subject to significant judgment and a variety of assumptions, variables and known and unknown uncertainties. These uncertainties may include inaccuracies in or incompleteness of the information available to the Group, particularly at the preliminary stages of matters, and assumptions by the Group as to future rulings of courts or other tribunals or the likely actions or positions taken by regulators or adversaries may prove incorrect. Moreover, estimates of possible loss for these matters are often not amenable to the use of statistical or other quantitative analytical tools frequently used in making judgments and estimates, and are subject to even greater degrees of uncertainty than in many other areas where the Group must exercise judgment and make estimates. The estimated possible loss, as well as any provisions taken, can be and often are substantially less than the amount initially requested by regulators or adversaries or the maximum potential loss that could be incurred were the matters to result in a final adjudication adverse to the Group. Moreover, in several regions in which the Group operates, an adversary often is not required to set forth the amount it is seeking, and where it is, the amount may not be subject to the same requirements that generally apply to pleading factual allegations or legal claims.

The matters for which the Group determines that the possibility of a future loss is more than remote will change from time to time, as will the matters as to which a reliable estimate can be made and the estimated possible loss for such matters. Actual results may prove to be significantly higher or lower than the estimate of possible loss in those matters where such an estimate was made. In addition, loss may be incurred in matters with respect to which the Group believed the likelihood of loss was remote. In particular, the estimated aggregate possible loss does not represent the Group's potential maximum loss exposure for those matters.

The Group may settle litigation or regulatory proceedings or investigations prior to a final judgment or determination of liability. It may do so to avoid the cost, management efforts or negative business, regulatory or reputational consequences of continuing to contest liability, even when the Group believes it has valid defenses to liability. It may also do so when the potential consequences of failing to prevail would be disproportionate to the costs of settlement. Furthermore, the Group may, for similar reasons, reimburse counterparties for their losses even in situations where it does not believe that it is legally compelled to do so.

Current Individual Proceedings

Set forth below are descriptions of civil litigation and regulatory enforcement matters or groups of matters for which the Group has taken material provisions, or for which there are material contingent liabilities that are more than remote, or for which there is the possibility of material business or reputational risk; similar matters are grouped together and some matters consist of a number of proceedings or claims. The disclosed matters also include matters for which the possibility of a loss is more than remote but for which the Group cannot reliably estimate the possible loss. Matters are presented below in English-language alphabetical order based on the titles the Group has used for them.

Anti-Money Laundering Matters Involving Former Correspondent Banking Relationships. Deutsche Bank has received requests for information from government authorities concerning certain former correspondent banking relationships, including Danske Bank. Deutsche Bank has provided information to and is otherwise cooperating with the investigating authorities. The bank also completed an internal investigation focused on the bank's historical processing of correspondent banking transactions on behalf of customers of Danske Bank's Estonia branch prior to cessation of the correspondent banking relationship with that branch in 2015, including of whether any violations of law, regulation or bank policy occurred and the effectiveness of the related internal control environment.

The Group has not disclosed whether it has established a provision or contingent liability with respect to these investigations because it has concluded that such disclosure can be expected to prejudice seriously their outcome.

On July 7, 2020, the New York State Department of Financial Services (DFS) issued a Consent Order, finding that Deutsche Bank violated New York State banking laws in connection with its relationships with three former Deutsche Bank clients, Danske Bank's Estonia branch, Jeffrey Epstein and FBME Bank, and imposing a U.S. \$ 150 million civil penalty in connection with these three former relationships, which Deutsche Bank paid in the third quarter of 2020.

On July 15, 2020, Deutsche Bank was named as a defendant in a securities class action filed in the U.S. District Court for the District of New Jersey, alleging that the bank made material misrepresentations regarding the effectiveness of its anti-money laundering (AML) controls and related remediation. The complaint cited allegations regarding control deficiencies raised in the DFS Consent Order related to the bank's relationships with Danske Bank's Estonia branch, Jeffrey Epstein and FBME Bank. On March 31, 2022, the court granted a motion to transfer the action to the U.S. District Court for the Southern District of New York (SDNY) and on May 18, 2022, the SDNY court granted in part and denied in part the motion to dismiss. On September 23, 2022, Deutsche Bank executed a settlement agreement with plaintiffs in the amount of U.S. \$ 26.25 million to resolve this action, and has recorded a provision in the same amount. On February 6, 2023, the Court entered a final judgment and order of dismissal with prejudice, approving the settlement and dismissing the action with prejudice.

Ongoing Regulatory Discussions. Deutsche Bank is engaged in ongoing regulatory discussions to resolve matters concerning adherence to prior orders and settlements related to sanctions and embargoes and AML compliance, and remedial agreements and obligations related to risk management issues.

The Group has not disclosed whether it has established a provision or contingent liability with respect to this matter because it has concluded that such disclosure can be expected to prejudice seriously the outcome.

BGH. On April 27, 2021, the German Federal Court of Justice (BGH) issued a ruling that certain clauses used in Deutsche Bank's General Terms and Conditions, which assume the customer consents following a notice and non-objection period, are void in relation to consumers (*Verbraucher*). The Group received the written reasoning for this judgment on May 27, 2021. The relevant clauses were widely used in the German banking industry. The BGH overturned the prior decisions of both the Regional Court and Higher Regional Court of Cologne, which had dismissed the claim brought forward by a consumer protection association. As a result of this ruling, fees introduced or increased since 2018 on the basis of this modification mechanism are potentially ineffective and consumers (*Verbraucher*) can claim repayment of respective banking fees. The Group has a civil litigation class provision of approximately € 6 million as of December 31, 2022 with respect to this matter.

Cum-ex Investigations and Litigations. Deutsche Bank has received inquiries from law enforcement authorities, including requests for information and documents, in relation to cum-ex transactions of clients. "Cum-ex" refers to trading activities in German shares around dividend record dates (trade date before and settlement date after dividend record date) for the purpose of obtaining German tax credits or refunds in relation to withholding tax levied on dividend payments including, in particular, transaction structures that have resulted in more than one market participant claiming such credit or refund with respect to the same dividend payment. Deutsche Bank is cooperating with the law enforcement authorities in these matters.

The Public Prosecutor in Cologne (*Staatsanwaltschaft Köln*, "CPP") has been conducting a criminal investigation since August 2017 concerning two former employees of Deutsche Bank in relation to cum-ex transactions of certain former clients of the bank. Deutsche Bank is a potential secondary participant pursuant to Section 30 of the German Law on Administrative Offences in this proceeding. Deutsche Bank is cooperating with the CPP. At the end of May and beginning of June 2019, the CPP initiated criminal investigations against further current and former employees of Deutsche Bank and five former Management Board members. In July 2020, in the course of inspecting the CPP's investigation file, Deutsche Bank learned that the CPP had further extended its investigation to include further current and former bank personnel, including one former and one then current Management Board member. In October 2022, the CPP conducted a search at Deutsche Bank's offices in Frankfurt and Eschborn. Based on the search warrant the CPP expanded the scope of the investigation and included further current and former Deutsche Bank employees and one additional former Management Board member in the investigation. The investigation is still at an early stage and the scope of the investigation may be further broadened.

In May 2021, Deutsche Bank learned through an information request received by Deutsche Oppenheim Family Office AG (“DOAG”) as legal successor of Sal. Oppenheim jr. & Cie. AG & Co. KGaA (“Sal. Oppenheim”) that the CPP in 2021 opened a criminal investigation proceeding in relation to cum-ex transactions against unknown former personnel of Sal. Oppenheim. DOAG provided the requested information on September 13 and October 15, 2021.

Deutsche Bank acted as participant in and filed withholding tax refund claims through the electronic refund procedure (*elektronisches Datenträgerverfahren*) on behalf of, inter alia, two former custody clients in connection with their cum-ex transactions. In February 2018, Deutsche Bank received from the German Federal Tax Office (*Bundeszentralamt für Steuern*, “FTO”) a demand of approximately € 49 million for tax refunds paid to a former custody client. Deutsche Bank expects to receive a formal notice for the same amount. On December 20, 2019, Deutsche Bank received a liability notice from the FTO requesting payment of € 2.1 million by January 20, 2020 in connection with tax refund claims Deutsche Bank had submitted on behalf of another former custody client. In 2020, Deutsche Bank made the requested payment and filed an objection against the liability notice. On July 28, 2021, Deutsche Bank received a letter from the FTO stating that the revised tax assessment notice dated December 2019 was not a valid administrative act as it could not be served to Deutsche Bank’s client due to its liquidation already in 2016. On the same day, FTO issued another liability notice to Deutsche Bank arguing that it issued incorrect tax certificates. On May 30, 2022, Deutsche Bank’s objections against the liability notices were rejected. On July 1, 2022, Deutsche Bank filed a claim against this rejection with the Fiscal Court of Cologne (*Finanzgericht Köln*).

By letter dated February 26, 2018, The Bank of New York Mellon SA/NV (“BNY”) informed Deutsche Bank of its intention to seek indemnification for potential cum-ex related tax liabilities incurred by BHF Asset Servicing GmbH (“BAS”) and/or Frankfurter Service Kapitalanlage-GmbH (“Service KAG”, now named BNY Mellon Service Kapitalanlage-Gesellschaft mbH). Deutsche Bank had acquired BAS and Service KAG as part of the acquisition of Sal. Oppenheim in 2010 and sold them to BNY in the same year. BNY estimates the potential tax liability to amount to up to € 120 million (excluding interest of 6 % p.a.). In November and December 2020 counsel to BNY informed Deutsche Bank that BNY and/or Service KAG (among others) have received notices from tax authorities in the estimated amount with respect to cum-ex related trades by certain investment funds in 2009 and 2010. BNY has filed objections against the notices. Following receipt of payment orders from tax authorities in the amount of € 60.6 million in relation to one of the investment funds and after consultation with Deutsche Bank, BNY in September 2022 paid € 13.6 million to tax authorities. The remaining € 47 million in relation to that fund were paid by Warburg Invest Kapitalanlagegesellschaft mbH (the investment fund’s manager). Further, following receipt of payment orders from tax authorities in the amount of € 11.8 million regarding another one of the investment funds and after consultation with Deutsche Bank, BNY in January/February 2023 paid € 7.9 million to tax authorities. The remaining € 3.9 million was paid by Hansainvest Hanseatische Investment-GmbH (the investment fund’s manager). In addition, BNY received from the Frankfurt Tax Office regarding another one of the investment funds a notice and payment request regarding penalty interest (*Hinterziehungszinsen*) in the amount of € 11.6 million with a payment deadline of February 13, 2023. BNY, after consultation with Deutsche Bank, applied for a suspension of enforcement (*Aussetzung der Vollziehung*) regarding the payment request. The underlying liability amount regarding this fund paid by BNY, after consultation with Deutsche Bank, to the Frankfurt Tax Office in 2021 was € 18.3 million.

On February 6, 2019, the Regional Court (*Landgericht*) Frankfurt am Main served Deutsche Bank with a claim by M.M. Warburg & CO Gruppe GmbH and M.M. Warburg & CO (AG & Co.) KGaA (together “Warburg”) in connection with cum-ex transactions of Warburg with a custody client of Deutsche Bank during 2007 to 2011. Warburg claimed from Deutsche Bank indemnification against German taxes in relation to transactions conducted in the years 2007 to 2011. Further, Warburg claimed compensation of unspecified damages relating to these transactions. Based on the tax assessment notices received for 2007 to 2011, Warburg claimed a total of € 250 million (of which € 166 million is in relation to taxes and € 84 million is in relation to interest). On March 20, 2020, Warburg extended its claim against Deutsche Bank to indemnify Warburg in relation to a € 176 million (thereof € 166 million in relation to taxes and € 10 million in relation to interest) criminal confiscation order issued by the Regional Court Bonn in the criminal cum-ex trial on March 18, 2020 regarding the same transactions. On July 28, 2021, the German Federal Court of Justice (BGH) confirmed the criminal confiscation. On September 23, 2020, the Frankfurt Regional Court fully dismissed Warburg’s claim against Deutsche Bank on the grounds that Warburg as the tax debtor (*Steuerschuldner*) is primarily liable and cannot request payment from Deutsche Bank. The court further held that any claims are time-barred. On October 29, 2020, Warburg appealed the decision with the Higher Regional Court (*Oberlandesgericht*) Frankfurt am Main. On December 1, 2021, Warburg reduced its claim from the first instance proceeding. Warburg now claims € 86 million (thereof € 63 million in relation to taxes and € 23 million in relation to interest). Further, Warburg claims an amount of € 54 million in relation to the criminal confiscation. In a judgment dated March 2, 2022, the Higher Regional Court (*Oberlandesgericht*) Frankfurt am Main fully dismissed Warburg’s appeal. The court did not admit an appeal of its decision to the German Federal Court of Justice (BGH). Warburg filed an appeal against this non-admission (*Nichtzulassungsbeschwerde*).

On January 25, 2021, the Regional Court (*Landgericht*) Hamburg served Deutsche Bank with a claim by Warburg Invest Kapitalanlagegesellschaft mbH ("Warburg Invest") in relation to transactions of two investment funds in 2009 and 2010, respectively. Warburg Invest was fund manager for both funds. Warburg Invest claims, from Deutsche Bank together with several other parties as joint and several debtors (*Gesamtschuldner*), indemnification against German taxes in relation to cum-ex transactions conducted by the two funds. Further, Warburg Invest claims compensation of unspecified damages relating to these transactions. In November 2020, Warburg Invest received a tax liability notice from tax authorities for one of the funds in the amount of € 61 million. Based on publicly available information Deutsche Bank estimates the tax amount for the second fund to be approximately € 49 million. Warburg Invest filed its claim against several parties including Deutsche Bank *inter alia* based on an allegation of intentional damage contrary to public policy (Section 826 German Civil Code) and the accusation that Deutsche Bank participated in a business model that was contrary to public policy (*sittenwidriges Geschäftsmodell*). On July 5, 2021, Deutsche Bank submitted its defense statement to the court. On December 31, 2021, two other defendants of the proceeding served a notice of dispute (*Streitverkündung*) to several parties including Deutsche Bank. On September 30, 2022, Warburg Invest withdrew its litigation (*Rücknahme der Klage*) as far as it relates to Deutsche Bank.

On February 26, 2021, the Regional Court (*Landgericht*) Frankfurt am Main served Deutsche Bank with a claim by Seriva Vermögensverwaltungs GmbH ("Seriva"). Seriva requested that Deutsche Bank reissue certain tax certificates (*Steuerbescheinigungen*) that Deutsche Bank withdrew in April 2017 in light of Seriva's cum-ex transactions. Deutsche Bank responded to Seriva's statement of claim on April 6, 2021. On July 5, 2021, Deutsche Bank received a reply brief from Seriva. Deutsche Bank responded on August 17, 2021. The hearing took place on February 7, 2022. In a judgment dated February 28, 2022, the court dismissed Seriva's claim. Seriva did not appeal the decision and thus the dismissal is final and binding.

The Group has not disclosed whether it has established a provision or contingent liability with respect to these matters because it has concluded that such disclosure can be expected to prejudice seriously their outcome.

FX Investigations and Litigations. Deutsche Bank has received requests for information from certain regulatory and law enforcement agencies globally who investigated trading in, and various other aspects of, the foreign exchange market. Deutsche Bank cooperated with these investigations. Relatedly, Deutsche Bank has conducted its own internal global review of foreign exchange trading and other aspects of its foreign exchange business.

On November 7, 2018, a group of asset managers opted out of a consolidated class settlement and filed litigation on an individual basis (*Allianz, et al. v. Bank of America Corporation, et al.*). Defendants' motion to dismiss was granted and denied in part on May 28, 2020. Plaintiffs filed a third amended complaint on July 28, 2020. Fact discovery substantially concluded in 2022 and expert discovery is underway. Deutsche Bank has also been named as a defendant in an amended and consolidated class action filed in Israel. This action asserts factual allegations similar to those made in the consolidated action in the United States and seeks damages pursuant to Israeli antitrust law as well as other causes of action. This action is in preliminary stages.

On November 11, 2020, Deutsche Bank was named in an action issued in the UK High Court of Justice (Commercial Court) brought by many of the same plaintiffs who brought *Allianz, et al. v. Bank of America Corporation, et al.* referred to above. The claim is based upon factual allegations similar to those made in *Allianz, et al. v. Bank of America Corporation, et al.* On March 4, 2022, the High Court ordered that the proceedings be transferred to the UK Competition Appeal Tribunal. The proceedings are at the pleadings stage. Deutsche Bank has reached an agreement in principle to resolve the *Allianz* proceedings in the US and UK.

On May 4, 2021, Deutsche Bank S.A. – Banco Alemão was named in a civil antitrust action brought in the São Paulo Civil Court of Central Jurisdiction by the Association of Brazilian Exporters (AEB) against certain FX dealers and affiliated financial institutions in Brazil. This action asserts factual allegations based on conduct investigated by the Brazilian competition authority, CADE, and seeks damages pursuant to Brazilian antitrust law. On February 22, 2022, the presiding judge dismissed the action on the basis that the action was not appropriate for a class proceeding. AEB has appealed the decision. Deutsche Bank has not yet been served.

The Group has not disclosed whether it has established a provision or contingent liability with respect to these matters because it has concluded that such disclosure can be expected to seriously prejudice their outcome.

Interbank and Dealer Offered Rates Matters. Regulatory and Law Enforcement Matters. Deutsche Bank has responded to requests for information from, and cooperated with, various regulatory and law enforcement agencies, in connection with industry-wide investigations concerning the setting of the London Interbank Offered Rate (LIBOR), Euro Interbank Offered Rate (EURIBOR), Tokyo Interbank Offered Rate (TIBOR) and other interbank and/or dealer offered rates.

From 2013 through 2017, Deutsche Bank entered into settlements with the European Commission, the U.S. Department of Justice (DOJ), the U.S. Commodity Futures Trading Commission (CFTC), the UK Financial Conduct Authority (FCA), the DFS and other regulators with respect to interbank and dealer offered rates matters. Other investigations of Deutsche Bank concerning the setting of various interbank and/or dealer offered rates remain ongoing.

The Group has not disclosed whether it has established a provision or contingent liability with respect to the remaining investigations because it has concluded that such disclosure can be expected to seriously prejudice their outcome.

Overview of Civil Litigations. Deutsche Bank is party to 7 U.S. civil actions concerning alleged manipulation relating to the setting of various interbank and/or dealer offered rates which are described in the following paragraphs, as well as actions pending in each of the UK, Israel, Argentina and Spain. Most of the civil actions, including putative class actions, are pending in the U.S. District Court for the Southern District of New York (SDNY), against Deutsche Bank and numerous other defendants. All but two of the U.S. civil actions were filed on behalf of parties who allege losses as a result of manipulation relating to the setting of U.S. dollar LIBOR. The two U.S. civil actions pending against Deutsche Bank that do not relate to U.S. dollar LIBOR were also filed in the SDNY, and include one consolidated action concerning Pound Sterling (GBP) LIBOR and one action concerning Swiss franc (CHF) LIBOR.

Claims for damages for all 7 of the U.S. civil actions discussed have been asserted under various legal theories, including violations of the U.S. Commodity Exchange Act, federal and state antitrust laws, the U.S. Racketeer Influenced and Corrupt Organizations Act, and other federal and state laws. The Group has not disclosed whether it has established a provision or contingent liability with respect to these matters because it has concluded that such disclosure can be expected to prejudice seriously their outcome.

U.S. dollar LIBOR. With one exception, all of the U.S. civil actions concerning U.S. dollar LIBOR are being coordinated as part of a multidistrict litigation (the "U.S. dollar LIBOR MDL") in the SDNY. In light of the large number of individual cases pending against Deutsche Bank and their similarity, the civil actions included in the U.S. dollar LIBOR MDL are now subsumed under the following general description of the litigation pertaining to all such actions, without disclosure of individual actions except when the circumstances or the resolution of an individual case is material to Deutsche Bank.

Following a series of decisions in the U.S. dollar LIBOR MDL between March 2013 and March 2019 narrowing their claims, plaintiffs are currently asserting antitrust claims, claims under the U.S. Commodity Exchange Act and U.S. Securities Exchange Act and state law fraud, contract, unjust enrichment and other tort claims. The court has also issued decisions dismissing certain plaintiffs' claims for lack of personal jurisdiction and on statute of limitations grounds.

On December 20, 2016, the district court issued a ruling dismissing certain antitrust claims while allowing others to proceed. Multiple plaintiffs have filed appeals of the district court's December 20, 2016 ruling to the U.S. Court of Appeals for the Second Circuit, and those appeals proceeded in parallel with the ongoing proceedings in the district court. On December 30, 2021, the Second Circuit affirmed the district court's decision on antitrust standing grounds but reversed the court's decision on personal jurisdiction grounds, and it remanded the cases to the district court for further proceedings. On March 9, 2022, defendants (including Deutsche Bank) filed a petition for a writ of certiorari to the U.S. Supreme Court to review the Court of Appeals' December 30, 2021 decision. The U.S. Supreme Court denied defendants' petition on June 21, 2022.

On December 13, 2022, plaintiff in a formerly stayed class action pending as part of the U.S. dollar LIBOR MDL (*Guaranty Bank & Trust Co. v. Credit Suisse Group AG, et al.*) filed a notice of voluntary dismissal, dismissing its case in its entirety. The court terminated the plaintiff from the MDL on December 14, 2022.

On January 11, 2023, Deutsche Bank and the plaintiff in a non-class action pending as part of the U.S. dollar LIBOR MDL (*City of Houston v. Bank of America Corp., et al.*) stipulated to the dismissal of plaintiff's claims against Deutsche Bank. The court dismissed the plaintiff's claims on January 12, 2023. On January 11, 2023, Deutsche Bank and the plaintiffs in ten consolidated non-class actions pending as part of the U.S. dollar LIBOR MDL (*The Regents of the University of California v. Bank of America Corp., et al.*; *City of Richmond, et al. v. Bank of America Corp., et al.*; *City of Riverside, et al. v. Bank of America Corp., et al.*; *County of Mendocino v. Bank of America Corp., et al.*; *County of Sacramento v. Bank of America Corp., et al.*; *County of San Diego v. Bank of America Corp., et al.*; *County of San Mateo, et al. v. Bank of America Corp., et al.*; *County of Sonoma, et al. v. Bank of America Corp., et al.*; *East Bay Municipal Utility District v. Bank of America Corp., et al.*; and *San Diego Association of Governments v. Bank of America Corp., et al.*) stipulated to the dismissal of plaintiffs' claims against Deutsche Bank. The court dismissed the plaintiffs' claims on January 12, 2023.

On January 17, 2023, plaintiff in a formerly stayed non-class action pending as part of the U.S. dollar LIBOR MDL (*George Maragos v. Bank of America Corp., et al.*) filed a notice of voluntary dismissal, dismissing its case in its entirety.

In August 2020, plaintiffs filed a non-class action in the U.S. District Court for the Northern District of California against several financial institutions, alleging that U.S. dollar LIBOR has been suppressed through the present. On November 10, 2020, plaintiffs moved the court for a preliminary and permanent injunction. On November 11, 2020, certain defendants moved to transfer the action to the SDNY; briefing of that motion is complete. On May 24, 2021, plaintiffs filed a motion for an order to show cause why the court should not order plaintiffs' previously requested injunction. Defendants moved to strike the motion. On June 3, 2021, the court issued an order (i) denying defendants' motion to transfer the action to the SDNY, (ii) denying defendants' motion to strike plaintiffs' May 24 motion and (iii) setting a hearing for the injunction motions for September 9, 2021. On September 9, 2021, the court held a hearing on the injunction motions and tentatively denied the motions. On December 23, 2021, the court issued a written decision denying the injunction motions. On September 13, 2022, the court granted the defendants' motion to dismiss, but granted plaintiffs leave to amend. On October 5, 2022, plaintiffs filed an amended complaint. Defendants filed a motion to dismiss the amended complaint on November 4, 2022, which remains pending. This action is not part of the U.S. dollar LIBOR MDL.

There is a further UK civil action regarding U.S. dollar LIBOR brought by the U.S. Federal Deposit Insurance Corporation (FDIC) acting as receiver for 19 failed financial institutions headquartered in the U.S., in which a claim for damages has been asserted pursuant to Article 101 of The Treaty on the Functioning of the European Union, Section 2 of Chapter 1 of the UK Competition Act 1998 and U.S. state laws. In February 2022, following a ruling issued by the U.S. Court of Appeals for the Second Circuit in relation to USD LIBOR antitrust claims, the UK LIBOR proceedings were stayed until July 31, 2022, to allow for clarification of the position in relation to the parallel proceedings brought by the FDIC against Deutsche Bank in the U.S. The FDIC filed an application to reinstate proceedings in the United States on July 18, 2022. Following the expiration of the UK stay, at a case management conference that took place in December 2022, the UK Court ordered a trial of a sample of three of the failed financial institutions. This 'sample bank' trial has been listed for a 19-week trial in February 2026. On December 28, 2022, the SDNY granted the FDIC's application to reinstate certain of its claims against Deutsche Bank (and the other foreign defendants) in the U.S. to the extent these claims survived a motion to dismiss on the merits and subject to defendants' reservation of rights to dispute the claims in the future.

A further class action regarding LIBOR has been filed in Argentina seeking damages for losses allegedly suffered by holders of Argentine bonds with interest rates based on LIBOR. Deutsche Bank is defending this action.

SIBOR and SOR. A putative class action alleging manipulation of the Singapore Interbank Offered Rate (SIBOR) and Swap Offer Rate (SOR) remains pending. On July 26, 2019, the SDNY granted defendants' motion to dismiss the action, dismissing all claims against Deutsche Bank, and denied plaintiff's motion for leave to file a fourth amended complaint. Plaintiff appealed that decision to the U.S. Court of Appeals for the Second Circuit. On March 17, 2021, the court reversed the SDNY's decision and remanded the case to the district court. On October 1, 2021, defendants (including Deutsche Bank) filed a petition for a writ of certiorari to the U.S. Supreme Court to review the Court of Appeals' March 17, 2021 decision. The petition was denied on January 10, 2022. On October 25, 2021, plaintiffs filed their fourth amended complaint, which defendants moved to dismiss on November 24, 2021. On March 17, 2022, Deutsche Bank executed a settlement agreement with plaintiffs in the amount of U.S. \$ 11 million to resolve this action. On June 9, 2022, the court granted preliminary approval of the settlement. On October 10, 2022, plaintiffs filed a motion seeking final approval of the settlement. On November 29, 2022, the court granted final approval of the settlement. Accordingly, the action is not included in the total number of actions above. The settlement amount, which Deutsche Bank has paid, is no longer reflected in Deutsche Bank's litigation provisions.

GBP LIBOR. A putative class action alleging manipulation of the Pound Sterling (GBP) LIBOR remains pending. On December 21, 2018, the SDNY partially granted defendants' motions to dismiss the action, dismissing all claims against Deutsche Bank. Plaintiffs filed a notice of appeal; the U.S. Court of Appeals for the Second Circuit ordered that the appeal be held in abeyance pending that court's decision in the appeal of the SIBOR and SOR class action. Following that court's decision in the SIBOR and SOR class action on March 17, 2021, the appeal is moving forward. Plaintiffs filed their opening brief on October 21, 2021, and all defendants-appellees' except Deutsche Bank filed their briefs on January 20, 2022. Also on January 20, 2022, plaintiffs filed a motion for (1) severance of their appeal with respect to Deutsche Bank, (2) stay of the severed appeal as to Deutsche Bank, and (3) limited remand of that portion of the matter concerning Deutsche Bank to the district court to consider the approval of a proposed settlement between plaintiffs and Deutsche Bank. The Second Circuit granted plaintiffs' motion on January 26, 2022. On March 31, 2022, Deutsche Bank executed a settlement agreement with plaintiffs in the amount of U.S. \$ 5 million to resolve this action. Plaintiffs filed a motion for preliminary approval of the settlement on July 29, 2022.

CHF LIBOR. A putative class action alleging manipulation of the Swiss Franc (CHF) LIBOR remains pending. On September 16, 2019, the SDNY granted defendants' motion to dismiss the action, dismissing all claims against Deutsche Bank. Plaintiffs filed a notice of appeal; the U.S. Court of Appeals for the Second Circuit ordered that the appeal be held in abeyance pending that court's decision in the appeal of the SIBOR and SOR class action. Following that court's decision in the SIBOR and SOR class action on March 17, 2021, the CHF LIBOR action was remanded to the district court for further proceedings. On April 18, 2022, Deutsche Bank executed a settlement agreement with plaintiffs in the amount of U.S. \$ 13 million to resolve this action. Plaintiffs filed a motion for preliminary approval of the settlement on June 29, 2022. On November 23, 2022, plaintiffs filed their third amended complaint. On February 15, 2023, the court granted preliminary approval of the settlement.

Spanish EURIBOR Claims. 77 claims in Spain (incorporating at least 258 claimants) have been notified or issued in court against Deutsche Bank by claimants with mortgage loans held by banks and other financial institutions for damages resulting from alleged collusive behavior by Deutsche Bank following the European Commission decision of December 4, 2013. Of those 77 claims, 69 have quantified their alleged losses with a total value of € 1 million and 6 (one of which includes 184 potential claimants) are yet to do so. Of the 77 claims, 51 claims have commenced in court and are at varying stages of maturity, with 35 claims having now been finally dismissed by the courts or withdrawn by the claimants, one decision pending a potential appeal and some claims stayed pending the outcome of the Trucks Cartel decision by the European Court of Justice (ECJ) and/or further referrals to the ECJ. The ECJ's Trucks Cartel decision of June 22, 2022 confirmed that the limitation period for claimants to notify/issue claims in Spanish EURIBOR would expire on June 30, 2022. Accordingly, the final date for claimants to notify/issue claims has passed.

Jeffrey Epstein Investigations and Litigation. Deutsche Bank has received requests for information from regulatory and law enforcement agencies concerning the bank's former client relationship with Jeffrey Epstein (individually, and through related parties and entities). In December 2018, Deutsche Bank began the process to terminate its relationship with Epstein, which began in August 2013. Deutsche Bank has provided information to and otherwise cooperated with the investigating agencies. The bank has also completed an internal investigation into the Epstein relationship.

As mentioned above, on July 7, 2020, the DFS issued a Consent Order, finding that Deutsche Bank violated New York State banking laws in connection with its relationships with three former Deutsche Bank clients, Danske Bank's Estonia branch, Jeffrey Epstein and FBME Bank, and imposing a U.S. \$ 150 million civil penalty in connection with these three former relationships, which Deutsche Bank paid in the third quarter of 2020. Also as mentioned above, the bank was also named as a defendant in a securities class action in the U.S. District Court for the Southern District of New York (SDNY) that included allegations relating to the bank's relationship with Jeffrey Epstein and other entities. Deutsche Bank executed a settlement agreement in that lawsuit, which the Court approved in an order dated February 6, 2023.

The Group has not established a provision or contingent liability with respect to the Jeffrey Epstein investigations. The remaining investigations relating to Jeffrey Epstein are understood to be ongoing.

On November 24, 2022, Deutsche Bank was named as a defendant in a putative class action complaint filed in the U.S. District Court for the Southern District of New York (SDNY) by an unnamed alleged sex trafficking victim of Jeffrey Epstein (Epstein), alleging claims against the bank under the Trafficking Victims Protection Act (TVPA), Racketeer Influenced and Corrupt Organizations Act (RICO) and New York state law in connection with the bank's provision of banking services to Epstein between August 2013 and December 2018. The lawsuit cites allegations regarding control deficiencies raised in the DFS Consent Order related to the bank's relationship with Jeffrey Epstein. Deutsche Bank filed a motion to dismiss the complaint on December 30, 2022. On January 13, 2023, the plaintiff filed an amended complaint. On February 7, 2023, Deutsche Bank filed a motion to dismiss the amended complaint.

The Group has not disclosed whether it has established a provision or contingent liability with respect to this litigation because it has concluded that such disclosure can be expected to prejudice seriously the outcome.

Mortgage-Related and Asset-Backed Securities – Issuer and Underwriter Civil Litigation. Deutsche Bank has been named as defendant in numerous civil litigations brought by private parties in connection with its various roles, including issuer or underwriter, in offerings of residential mortgage-backed securities (RMBS) and other asset-backed securities. These cases, described below, allege that the offering documents contained material misrepresentations and omissions, including with regard to the underwriting standards pursuant to which the underlying mortgage loans were issued, or assert that various representations or warranties relating to the loans were breached at the time of origination. The Group has recorded provisions with respect to several of these civil cases, but has not recorded provisions with respect to all of these matters. The Group has not disclosed the amount of these provisions because it has concluded that such disclosure can be expected to prejudice seriously the resolution of these matters.

Deutsche Bank is a defendant in a class action relating to its role as one of the underwriters of six RMBS offerings issued by Novastar Mortgage Corporation. No specific damages are alleged in the complaint. The lawsuit was brought by plaintiffs representing a class of investors who purchased certificates in those offerings. The parties reached a settlement to resolve the matter for a total of U.S. \$ 165 million, a portion of which was paid by the bank. On August 30, 2017, FHFA/Freddie Mac filed an objection to the settlement and shortly thereafter appealed the district court's denial of their request to stay settlement approval proceedings, which appeal was resolved against FHFA/Freddie Mac. The court approved the settlement on March 7, 2019 over FHFA/Freddie Mac's objections. FHFA filed its appeal on June 28, 2019, which was denied on March 14, 2022, and a subsequent petition for rehearing was denied on June 2, 2022. FHFA elected not to file a petition for certiorari in the U.S. Supreme Court, thus ending its challenge to the settlement.

Deutsche Bank is a defendant in an action related to RMBS offerings brought by the FDIC as receiver for Citizens National Bank and Strategic Capital Bank (alleging an unspecified amount in damages against all defendants). In this action, the appellate court reinstated claims previously dismissed on statute of limitations grounds and petitions for rehearing and certiorari to the U.S. Supreme Court were denied. On July 31, 2017, the FDIC filed a second amended complaint, which defendants moved to dismiss on September 14, 2017. On October 18, 2019, defendants' motion to dismiss was denied. On May 13, 2022, the FDIC voluntarily dismissed its claim with respect to one of the RMBS offerings and Deutsche Bank filed a motion for summary judgment seeking dismissal of the remaining claim. Deutsche Bank's motion has been fully briefed as of July 8, 2022. Discovery is stayed pending resolution of Deutsche Bank's motion.

In June 2014, HSBC, as trustee, brought an action in New York state court against Deutsche Bank to revive a prior action, alleging that Deutsche Bank failed to repurchase mortgage loans in the ACE Securities Corp. 2006-SL2 RMBS offering. The revival action was stayed during the pendency of an appeal of the dismissal of a separate action wherein HSBC, as trustee, brought an action against Deutsche Bank alleging breaches of representations and warranties made by Deutsche Bank concerning the mortgage loans in the same offering. On March 29, 2016, the court dismissed the revival action. Plaintiff appealed and on November 19, 2019, the appellate court affirmed the dismissal. On December 19, 2019, plaintiff filed a motion to appeal to the New York Court of Appeals in the appeals court, which was denied on February 13, 2020. On March 16, 2020, plaintiff petitioned the New York Court of Appeals for leave to appeal, which was granted on September 1, 2020. The Court of Appeals heard argument on May 19, 2022 and affirmed the dismissal of the action on June 16, 2022.

Deutsche Bank is a defendant in cases concerning two RMBS trusts that were brought initially by RMBS investors and subsequently by HSBC, as trustee, in New York state court. The cases allege breaches of loan-level representations and warranties in the ACE Securities Corp. 2006-FM1 and ACE Securities Corp. 2007-ASAP1 RMBS offerings, respectively. Both cases were dismissed on statute of limitations grounds by the trial court on March 28, 2018. Plaintiff appealed the dismissals. On April 25, 2019, the First Department affirmed the dismissals on claims for breach of representations and warranties and for breach of the implied covenant of good faith and fair dealing, but reversed the denial of the motions for leave to file amended complaints alleging failure to notify the trustee of alleged representations and warranty breaches. HSBC filed amended complaints on April 30, 2019, and Deutsche Bank filed its answers on June 3, 2019. Discovery is ongoing. On October 25, 2019, plaintiffs filed two complaints (one by HSBC and one by a certificateholder) seeking to revive, under Section 205(a) of the New York Civil Practice Law and Rules, the breach of representations and warranties claims as to which dismissal was affirmed in the case concerning ACE 2006-FM1. On December 16, 2019, Deutsche Bank moved to dismiss these actions. On July 2, 2022, the Court granted the motion to dismiss the certificateholder action. Plaintiff appealed to the First Department on August 4, 2022, and the appeal remains outstanding. On October 4, 2022, the Court dismissed the HSBC action in light of the Court of Appeals' decision in the SL2 case described above. On November 7, 2022, plaintiff filed an appeal that remains pending.

In the actions against Deutsche Bank solely as an underwriter of other issuers' RMBS offerings, Deutsche Bank has contractual rights to indemnification from the issuers, but those indemnity rights may in whole or in part prove effectively unenforceable where the issuers are now or may in the future be in bankruptcy or otherwise defunct.

Mortgage-Related and Asset-Backed Securities – Trustee Civil Litigation. Deutsche Bank National Trust Company ("DBNTC") and Deutsche Bank Trust Company Americas ("DBTCA") (collectively, the "Trustees") are defendants in three separate civil lawsuits, and DBNTC is a defendant in a fourth civil lawsuit, brought by investors concerning the Trustees' role as trustees of certain RMBS trusts. The actions generally allege claims for breach of contract, breach of fiduciary duty, breach of the duty to avoid conflicts of interest, negligence and/or violations of the U.S. Trust Indenture Act of 1939, based on the Trustees' alleged failure to perform adequately certain obligations and/or duties as trustee for the trusts.

The four lawsuits include actions by (a) the National Credit Union Administration Board ("NCUA"), as an investor in 18 trusts that allegedly suffered total realized collateral losses of more than U.S. \$ 3.7 billion; (b) certain CDOs (collectively, "Phoenix Light") as investors in 43 trusts, and seeking "hundreds of millions of dollars in damages"; (c) Commerzbank AG, as an investor in 50 RMBS trusts, seeking "hundreds of millions of dollars in losses"; and (d) IKB International, S.A. in Liquidation and IKB Deutsche Industriebank A.G. (collectively, "IKB"), as an investor in 17 RMBS trusts, originally seeking more than U.S. \$ 268 million of damages before IKB voluntarily discontinued its claims as to certain RMBS certificates. In the NCUA case, DBNTC's motion to dismiss the amended complaint was granted in part and denied in part, dismissing NCUA's tort claims but preserving its breach-of-contract claims. Both parties filed motions for partial summary judgment and those motions are fully briefed and pending before the court. On February 8, 2022, the court in the Phoenix Light case granted DBNTC's and DBTCA's motion for summary judgment, denied Phoenix Light's motion for summary judgment, and dismissed the action. On March 10, 2022, Phoenix Light filed a notice of appeal with respect to the court's orders on the motions to dismiss and for summary judgment. That appeal is fully briefed and pending oral argument. On February 8, 2022, the court in the Commerzbank case granted in part and denied in part DBNTC's and DBTCA's motion for summary judgment, dismissing all of the tort claims and dismissing the breach of contract claim relating to certain of the trusts, and denied Commerzbank's motion for summary judgment in its entirety. Discovery is ongoing. On January 27, 2021, the court in the IKB case granted in part and denied in part the Trustees' motion to dismiss, dismissing certain of IKB's claims but allowing certain of its breach of contract and tort claims to go forward; on May 10, 2021, the Trustees filed a notice of appeal regarding certain aspects of that order and, on May 20, 2021, IKB filed a notice of cross-appeal with respect to other aspects of that order. On August 30, 2022, the New York Supreme Court, Appellate Division, First Department, affirmed in part and reversed in part the trial court's order on the motion to dismiss. On September 30, 2022, DBNTC and DBTCA filed a motion for leave to appeal the decision to the Court of Appeals, and on that same day, IKB filed a motion for reargument or for leave to appeal to the New York Court of Appeals, as to certain aspects of the First Department's decision. On November 10, 2022, the First Department granted DBNTC's and DBTCA's motion for leave to appeal to the Court of Appeals, denied IKB's motion for reargument, and denied as moot IKB's motion for leave to appeal to the Court of Appeals. DBNTC's and DBTCA's appeal is currently being briefed. Discovery is ongoing.

The Group has established contingent liabilities with respect to certain of these matters, but the Group has not disclosed the amounts because it has concluded that such disclosure can be expected to seriously prejudice the outcome of these matters.

Off-Channel Communications Investigations. On September 27, 2022, U.S. Securities and Exchange Commission (SEC) and the CFTC announced resolutions with multiple financial institutions including Deutsche Bank AG and its subsidiaries Deutsche Bank Securities Inc. ("DBSI"), DWS Investment Management Americas, Inc. ("DIMA") and DWS Distributors, Inc. ("DDI") and, together with DIMA, "DWS"), with respect to industry-wide investigations regarding compliance with record retention requirements applicable to broker-dealer firms, investment advisers, swap dealers, and futures commission merchants. The SEC and CFTC found that Deutsche Bank, DBSI and DWS, as applicable, did not maintain certain electronic communications required to be maintained pursuant to their respective record retention obligations because the communications were sent or received by employees over unapproved electronic messaging channels from personal devices. The SEC and CFTC also found related supervisory failures. Under these resolutions, DBSI and DWS paid a U.S.\$ 125 million civil monetary penalty to the SEC, and Deutsche Bank and DBSI paid a U.S.\$ 75 million civil monetary penalty to the CFTC. As part of the resolutions, Deutsche Bank, DBSI and DWS have hired a compliance consultant to conduct a review of relevant policies and procedures, trainings, surveillance measures, technological solutions, and disciplinary framework, and submit a report to the SEC and CFTC with findings and recommendations.

Polish Mortgage Matters. Starting in 2016, certain clients of Deutsche Bank Polska S.A. have reached out to Deutsche Bank Polska S.A. alleging that their mortgage loan agreements in foreign currency include unfair clauses and are invalid. These clients have demanded reimbursement of the alleged overpayments under such agreements totaling over € 384 million with more than 3,000 civil claims having been commenced in Polish courts. This type of cases is an industry wide issue in Poland and other banks are facing similar claims. Deutsche Bank Polska S.A. has and will take necessary legal actions to defend itself and challenge such claims in courts.

The Group has established a portfolio provision to cover potential losses from the existing and potential litigation related to mortgage loans in foreign currency. The amount of the portfolio provision is approximately € 283 million and may be subject to future changes in estimate depending in particular on the jurisprudence of local courts as well as the Court of Justice of European Union.

Postbank Voluntary Public Takeover Offer. On September 12, 2010, Deutsche Bank announced the decision to make a voluntary takeover offer for the acquisition of all shares in Deutsche Postbank AG (Postbank). On October 7, 2010, the bank published its official takeover offer and offered Postbank shareholders a consideration of € 25 for each Postbank share. This offer was accepted for a total of approximately 48.2 million Postbank shares.

In November 2010, a former shareholder of Postbank, Effecten-Spiegel AG, which had accepted the takeover offer, brought a claim against Deutsche Bank alleging that the offer price was too low and was not determined in accordance with the applicable German laws. The plaintiff alleges that Deutsche Bank had been obliged to make a mandatory takeover offer for all shares in Postbank, at the latest, in 2009 as the voting rights of Deutsche Post AG in Postbank had to be attributed to Deutsche Bank pursuant to Section 30 of the German Takeover Act. Based thereon, the plaintiff alleges that the consideration offered by Deutsche Bank for the shares in Postbank in the 2010 voluntary takeover offer needed to be raised to € 57.25 per share.

The Regional Court Cologne (*Landgericht*) dismissed the claim in 2011 and the Cologne appellate court dismissed the appeal in 2012. The Federal Court set this judgment aside and referred the case back to the Higher Regional Court Cologne to take evidence on certain allegations of the plaintiff.

Starting in 2014, additional former shareholders of Postbank, who accepted the 2010 tender offer, brought similar claims as Effecten-Spiegel AG against Deutsche Bank which are pending with the Regional Court Cologne and the Higher Regional Court of Cologne, respectively. On October 20, 2017, the Regional Court Cologne handed down a decision granting the claims in a total of 14 cases which were combined in one proceeding. The Regional Court Cologne took the view that Deutsche Bank was obliged to make a mandatory takeover offer already in 2008 so that the appropriate consideration to be offered in the takeover offer should have been € 57.25 per Postbank share (instead of € 25). The additional consideration per share owed to shareholders which have accepted the takeover offer would thus amount to € 32.25 . Deutsche Bank appealed this decision and the appeal was assigned to the 13th Senate of the Higher Regional Court of Cologne, which also heard the appeal of Effecten-Spiegel AG.

In 2019 and 2020 the Higher Regional Court Cologne called a number of witnesses in both cases. The individuals heard included current and former board members of Deutsche Bank, Deutsche Post AG and Postbank as well as other persons involved in the Postbank transaction. In addition, the Higher Regional Court Cologne issued orders for the production of relevant transaction documents entered into between Deutsche Bank and Deutsche Post AG in 2008 and 2009. Deutsche Bank had therefore deposited the originals of these documents with the court in 2019.

On December 16, 2020, the Higher Regional Court Cologne handed down a decision and fully dismissed the claims of Effecten-Spiegel AG. Further, in a second decision handed down on December 16, 2020, the Higher Regional Court Cologne allowed the appeal of Deutsche Bank against the decision of the Regional Court Cologne dated October 20, 2017 and dismissed all related claims of the relevant plaintiffs. The Higher Regional Court Cologne granted leave to appeal to the German Federal Court (*Bundesgerichtshof*) as regards both decisions and all relevant plaintiffs lodged their respective appeals with the Federal Court by February 2021. On December 13, 2022, the German Federal Court announced its decision, setting aside the judgments of the Higher Regional Court of Cologne and remanding the cases back to the Higher Regional Court.

Deutsche Bank has been served with a large number of additional lawsuits filed against Deutsche Bank shortly before the end of 2017, almost all of which are now pending with the Regional Court Cologne. Some of the new plaintiffs allege that the consideration offered by Deutsche Bank AG for the shares in Postbank in the 2010 voluntary takeover should be raised to € 64.25 per share.

The claims for payment against Deutsche Bank in relation to these matters total almost € 700 million (excluding interest).

The Group has established a contingent liability with respect to these matters but the Group has not disclosed the amount of this contingent liability because it has concluded that such disclosure can be expected to prejudice seriously the outcome of these matters.

Further Proceedings Relating to the Postbank Takeover. In September 2015, former shareholders of Postbank filed in the Regional Court Cologne shareholder actions against Postbank to set aside the squeeze-out resolution taken in the shareholders meeting of Postbank in August 2015 (actions for avoidance). Among other things, the plaintiffs alleged that Deutsche Bank was subject to a suspension of voting rights with respect to its shares in Postbank based on the allegation that Deutsche Bank failed to make a mandatory takeover offer. The squeeze out is final and the proceeding itself has no reversal effect, but may result in damage payments. The claimants refer to legal arguments similar to those asserted in the Effecten-Spiegel proceeding described above. In a decision on October 20, 2017, the Regional Court Cologne declared the squeeze-out resolution to be void. The court, however, did not rely on a suspension of voting rights due to an alleged failure of Deutsche Bank to make a mandatory takeover offer, but argued that Postbank violated information rights of Postbank shareholders in Postbank's shareholders meeting in August 2015. Postbank has appealed this decision. On May 15, 2020, DB Privat- und Firmenkundenbank AG (legal successor of Postbank due to a merger in 2018) was merged into Deutsche Bank AG. On July 3, 2020, Deutsche Bank AG withdrew the appeal as regards the actions for avoidance because efforts and costs to pursue this appeal became disproportionate to the minor remaining economic importance of the case considering that the 2015 squeeze-out cannot be reversed. As a consequence, the first instance judgement which found that Postbank violated the information rights of its shareholders in the shareholders' meeting became final.

The legal question of whether Deutsche Bank had been obliged to make a mandatory takeover offer for all Postbank shares prior to its 2010 voluntary takeover may also impact two pending appraisal proceedings (*Spruchverfahren*). These proceedings were initiated by former Postbank shareholders with the aim to increase the cash compensation offered in connection with the squeeze-out of Postbank shareholders in 2015 and the cash compensation offered and annual compensation paid in connection with the execution of a domination and profit and loss transfer agreement (*Beherrschungs- und Gewinnabführungsvertrag*) between DB Finanz-Holding AG (now DB Beteiligungs-Holding GmbH) and Postbank in 2012.

The applicants in the appraisal proceedings claim that a potential obligation of Deutsche Bank to make a mandatory takeover offer for Postbank at an offer price of € 57.25 should be decisive when determining the adequate cash compensation in the appraisal proceedings. The Regional Court Cologne had originally followed this legal view of the applicants in two resolutions. In a decision dated June 2019, the Regional Court Cologne expressly gave up this legal view in the appraisal proceedings in connection with execution of a domination and profit and loss transfer agreement. According to this decision, the question whether Deutsche Bank was obliged to make a mandatory offer for all Postbank shares prior to its voluntary takeover offer in 2010 shall not be relevant for determining the appropriate cash compensation. It is likely that the Regional Court Cologne will take the same legal position in the appraisal proceedings in connection with the squeeze-out. On October 1, 2020, the Regional Court Cologne handed down a decision in the appraisal proceeding concerning the domination and profit and loss transfer agreement (dated December 5, 2012) according to which the annual compensation pursuant to Section 304 of the German Stock Corporation Act (*jährliche Ausgleichszahlung*) shall be increased by € 0.12 to € 1.78 per Postbank share and the settlement amount pursuant to Section 305 of the German Stock Corporation Act (*Abfindungsbetrag*) shall be increased by € 4.56 to € 29.74 per Postbank share. The increase of the settlement amount is of relevance for approximately 492,000 former Postbank shares whereas the increase of the annual compensation is of relevance for approximately 7 million former Postbank shares. Deutsche Bank as well as the applicants have lodged an appeal against this decision.

The Group has not disclosed whether it has established a provision or contingent liability with respect to this matter because it has concluded that such disclosure can be expected to prejudice seriously its outcome.

Russia/UK Equities Trading Investigation. Deutsche Bank has investigated the circumstances around equity trades entered into by certain clients with Deutsche Bank in Moscow and London. The total volume of transactions reviewed is significant. Deutsche Bank's internal investigation of potential violations of law, regulation and policy and into the related internal control environment has concluded, and Deutsche Bank has assessed the findings identified during the investigation; to date it has identified certain violations of Deutsche Bank's policies and deficiencies in Deutsche Bank's control environment. Deutsche Bank has advised regulators and law enforcement authorities in several jurisdictions (including Germany, Russia, the UK and the United States) of this investigation. Deutsche Bank has taken disciplinary measures with regards to certain individuals in this matter.

On January 30, 2017, the DFS and the FCA announced settlements with the bank related to their investigations into this matter. The settlements conclude the DFS's and the FCA's investigations into the bank's AML control function in its investment banking division, including in relation to the equity trading described above. Under the terms of the settlement agreement the DFS issued a Consent Order pursuant to which Deutsche Bank agreed to pay a civil monetary penalty of U.S. \$ 425 million and to engage an independent monitor for a term of up to two years. Under the terms of the settlement agreement with the FCA, Deutsche Bank agreed to pay a civil monetary penalty of approximately GBP 163 million.

On May 30, 2017, the Federal Reserve announced its settlement with the bank resolving this matter as well as additional AML issues identified by the Federal Reserve. Deutsche Bank paid a penalty of U.S. \$ 41 million. Deutsche Bank also agreed to retain independent third parties to assess its Bank Secrecy Act/AML program and review certain foreign correspondent banking activity of its subsidiary Deutsche Bank Trust Company Americas. The bank was also required to submit written remediation plans and is conducting ongoing remediation.

Deutsche Bank continues to cooperate with regulators and law enforcement authorities, including the DOJ which has its own investigation into these securities trades that is understood to be ongoing. The Group has recorded a provision with respect to the remaining investigation. The Group has not disclosed the amount of this provision because it has concluded that such disclosure can be expected to prejudice seriously the outcome of this matter.

Sovereign, Supranational and Agency Bonds (SSA) Investigations and Litigations. Deutsche Bank has received inquiries from certain regulatory and law enforcement authorities, including requests for information and documents, pertaining to SSA bond trading. Deutsche Bank is cooperating with these investigations.

On December 6, 2022, the European Commission sent a Statement of Objections to Deutsche Bank regarding a potential breach of EU antitrust rules in relation to secondary market trading of Euro-denominated SSA bonds, Sovereign bonds, Covered bonds, and Government guaranteed bonds. Deutsche Bank proactively cooperated with the European Commission in this matter and as a result was granted immunity. The sending of a Statement of Objections is a step in the European Commission's investigation and does not prejudice the outcome of the investigation, which is ongoing.

Deutsche Bank is a defendant in a putative class action filed on December 9, 2022 in the U.S. District Court for the Southern District of New York by alleged direct market participants claiming a violation of antitrust law related to alleged manipulation of the secondary trading market for Euro-denominated Sovereign bonds. The complaint seeks treble damages and attorneys' fees. The case is in the early stages.

Deutsche Bank is also a defendant in putative class actions filed on November 7, 2017 and December 5, 2017 in the Ontario Superior Court of Justice and Federal Court of Canada, respectively, claiming violations of antitrust law and the common law relating to alleged manipulation of secondary trading of SSA bonds. The complaints seek compensatory and punitive damages. On July 20, 2022, Deutsche Bank entered into a national settlement agreement that would resolve the Federal SSA Claim against all Deutsche Bank defendants. The settlement agreement remains subject to approval by the Federal Court of Canada.

Deutsche Bank was named as a defendant in a consolidated putative class action filed in the U.S. District Court for the Southern District of New York alleging violations of U.S. antitrust law and a claim for unjust enrichment relating to Mexican government bond trading. In October 2019, the court granted defendants' motion to dismiss plaintiffs' consolidated amended complaint without prejudice. In December 2019, plaintiffs filed a Second Amended Complaint, which the court dismissed without prejudice on November 30, 2020. On May 20, 2021, plaintiffs filed a motion for reconsideration, which was denied on March 30, 2022. On September 15, 2022, plaintiffs-appellants noticed an appeal to the Second Circuit and filed their opening brief on November 7, 2022. Defendants-appellees' opposition was filed on February 6, 2023. On January 22, 2021, Deutsche Bank was notified that the Mexican competition authority, COFECE, reached a resolution that imposes fines against DB Mexico and two of its former traders, as well as six other financial institutions and nine other traders, for engaging in alleged monopolistic practices in the Mexican government bond secondary market. DB Mexico has appealed. The fine against DB Mexico was approximately U.S. \$ 427,000 .

Other than as noted above, the Group has not disclosed whether it has established provisions or contingent liabilities with respect to the matters referred to above because it has concluded that such disclosure can be expected to prejudice seriously their outcome.

US Treasury Securities Investigations. Deutsche Bank has received inquiries from certain regulatory and law enforcement authorities, including requests for information and documents, pertaining to U.S. Treasuries auctions, trading, and related market activity. Deutsche Bank has cooperated with these investigations.

DBSI was a defendant in several putative class actions alleging violations of U.S. antitrust law, the U.S. Commodity Exchange Act and common law related to the alleged manipulation of the U.S. Treasury securities market. These cases have been consolidated in the Southern District of New York. On November 16, 2017, plaintiffs filed a consolidated amended complaint, which did not name DBSI as a defendant. On December 11, 2017, the court dismissed DBSI from the class action without prejudice. On March 31, 2021, the court granted the defendants' motion to dismiss. On May 14, 2021, the plaintiffs filed a second amended complaint, which also did not name DBSI as a defendant. Defendants filed a motion to dismiss this second amended complaint, which was granted on March 31, 2022. The plaintiffs filed a notice of appeal on April 28, 2022.

On June 18, 2020, the CFTC entered an order pursuant to settlement with DBSI for alleged spoofing by two Tokyo-based traders between January and December 2013. Without admitting or denying the findings or conclusions therein, Deutsche Bank consented to the entry of the order, including a civil monetary fine of U.S. \$ 1.25 million.

The Group has not disclosed whether it has established a provision or contingent liability with respect to these matters because it has concluded that such disclosure can be expected to seriously prejudice their outcome.

U.S. Treasury Spoofing Litigation. Following the bank's settlement with the CFTC mentioned above, five separate putative class actions were filed in the Northern District of Illinois against Deutsche Bank AG and DBSI. The cases allege that Deutsche Bank and other unnamed entities participated in a scheme from January to December 2013 to spoof the market for Treasuries futures and options contracts and Eurodollar futures and options contracts. Plaintiffs filed a consolidated complaint on November 13, 2020. Deutsche Bank AG and DBSI filed a motion to dismiss on January 15, 2021; briefing on the motion to dismiss concluded on April 16, 2021. On September 20, 2021, the judge ordered supplemental briefing on the issues of standing and jurisdictional discovery. On July 20, 2022, the judge ordered limited jurisdictional discovery on the issue of standing. Jurisdictional discovery is ongoing, with the next status report due on or before April 5, 2023.

The Group has not disclosed whether it has established a provision or contingent liability with respect to these matters because it has concluded that such disclosure can be expected to prejudice seriously their outcome.

28 – Credit related Commitments and Contingent Liabilities

Irrevocable lending commitments and lending related contingent liabilities

In the normal course of business the Group regularly enters into irrevocable lending commitments, including fronting commitments as well as contingent liabilities consisting of financial and performance guarantees, standby letters of credit and indemnity agreements on behalf of its customers. Under these contracts the Group is required to perform under an obligation agreement or to make payments to the beneficiary based on third party's failure to meet its obligations. For these instruments it is not known to the Group in detail if, when and to what extent claims will be made. In the event that the Group has to pay out cash in respect of its fronting commitments, the Group would immediately seek reimbursement from the other syndicate lenders. The Group considers all the above instruments in monitoring the credit exposure and may require collateral to mitigate inherent credit risk. If the credit risk monitoring provides sufficient perception about a loss from an expected claim, a provision is established and recorded on the balance sheet.

The following table shows the Group's revocable lending commitments, irrevocable lending commitments and lending related contingent liabilities without considering collateral or provisions. It shows the maximum potential utilization of the Group in case all these liabilities entered into must be fulfilled. The table therefore does not show the expected future cash flows from these liabilities as many of them will expire without being drawn and arising claims will be honored by the customers or can be recovered from proceeds of arranged collateral.

Irrevocable lending commitments and lending related contingent liabilities

in € m.	Dec 31, 2022	Dec 31, 2021
Irrevocable lending commitments ¹	202,595	184,634
Revocable lending commitments	48,425	49,798
Contingent liabilities	67,214	59,394
Total	318,234	293,825

¹ Prior year's comparatives aligned to presentation in the current year.

Other commitments and other contingent liabilities

The following table shows the Group's other irrevocable commitments and other contingent liabilities without considering collateral or provisions. It shows the maximum potential utilization of the Group in case all these liabilities entered into must be fulfilled. The table therefore does not show the expected future cash flows from these liabilities as many of them will expire without being drawn and arising claims will be honored by the customers or can be recovered from proceeds of arranged collateral.

Other commitments and other contingent liabilities

in € m.	Dec 31, 2022	Dec 31, 2021
Other commitments ¹	0	0
Other contingent liabilities	73	77
Total	73	77

¹ Prior year's comparatives aligned to presentation in the current year.

Government Assistance

In the course of its business, the Group regularly applies for and receives government support by means of Export Credit Agency ("ECA") guarantees covering transfer and default risks for the financing of exports and investments into Emerging Markets and to a lesser extent, developed markets for Structured Trade & Export Finance and short- and medium-term Trade Finance business. Almost all export-oriented states have established such ECAs to support their domestic exporters. The ECAs act in the name and on behalf of the government of their respective country and are either constituted directly as governmental departments or organized as private companies vested with the official mandate of the government to act on its behalf. Terms and conditions of such ECA guarantees are broadly similar due to the fact that most of the ECAs act within the scope of the Organization for Economic Cooperation and Development ("OECD") consensus rules. The OECD consensus rules, an intergovernmental agreement of the OECD member states, define benchmarks intended to ensure that a fair competition between different exporting nations will take place.

In some countries dedicated funding programs with governmental support are offered for ECA-covered financings. The Group makes use of such programs to assist its clients in the financing of exported goods and services. In certain financings, the Group also receives government guarantees from national and international governmental institutions as collateral to support financings in the interest of the respective governments. The majority of such ECA guarantees received by the Group were issued either by Korean Export Credit Agencies (Korea Trade Insurance Corporation and The Export-Import Bank of Korea) acting on behalf of the Republic of Korea, by the Euler-Hermes Kreditversicherungs-AG acting on behalf of the Federal Republic of Germany, by the Italian Export Credit Agency (SACE S.p.A.) acting on behalf of the Italian Republic or by the UK Export Finance Agency acting on behalf of the United Kingdom of Great Britain and Northern Ireland.

Irrevocable payment commitments with regard to levies

Irrevocable payment commitments related to bank levy according to Bank Recovery and Resolution Directive (BRRD), the Single Resolution Fund (SRF) and the German deposit protection amounted to € 1.3 billion as of December 31, 2022, and to € 1.1 billion as of December 31, 2021.

29 – Other Short-Term Borrowings

in € m.	Dec 31, 2022	Dec 31, 2021
Other short-term borrowings:		
Commercial paper	1,899	1,840
Other	3,223	2,194
Total other short-term borrowings	5,122	4,034

30 – Long-Term Debt and Trust Preferred Securities

Long-Term Debt by Earliest Contractual Maturity

in € m.	Due in 2023	Due in 2024	Due in 2025	Due in 2026	Due in 2027	Due after 2027	Total Dec 31, 2022	Total Dec 31, 2021
Senior debt:								
Bonds and notes:								
Fixed rate	13,207	10,856	8,893	10,916	9,622	10,491	63,986	63,446
Floating rate	1,419	2,235	3,023	2,398	573	4,921	14,571	18,182
Other	30,528	4,385	451	457	334	5,433	41,588	53,960
Subordinated debt:								
Bonds and notes:								
Fixed rate	58	10	2,504	1,946	2,455	2,670	9,644	7,191
Floating rate	1,276	26	190	0	0	0	1,491	1,412
Other	135	25	0	42	20	23	245	293
Total long-term debt	46,622	17,537	15,061	15,761	13,004	23,539	131,525	144,485

The Group did not have any defaults of principal, interest or other breaches with respect to its liabilities in 2022 and 2021.

Trust Preferred Securities¹

in € m.	Dec 31, 2022	Dec 31, 2021
Fixed rate	0	0
Floating rate	500	528
Total trust preferred securities	500	528

¹ Perpetual instruments, redeemable at specific future dates at the Group's option.

31 – Maturity Analysis of the earliest contractual undiscounted cash flows of Financial Liabilities

	Dec 31, 2022				
in € m.	On demand	Due within 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years
Noninterest bearing deposits	253,989	0	0	0	0
Interest bearing deposits	131,941	132,641	92,816	16,414	9,735
Trading liabilities ¹	50,664	0	0	0	0
Negative market values from derivative financial instruments ¹	282,418	0	0	0	0
Financial liabilities designated at fair value through profit or loss	24,942	19,335	4,696	4,082	3,478
Investment contract liabilities ²	0	0	469	0	0
Negative market values from derivative financial instruments qualifying for hedge accounting ³	0	325	186	61	149
Central bank funds purchased	0	0	0	0	0
Securities sold under repurchase agreements	3,603	398	21	41	15
Securities loaned	12	1	0	0	0
Other short-term borrowings	3,003	2,149	142	0	0
Long-term debt	1	34,050	17,377	71,882	22,529
Trust preferred securities	0	0	514	0	0
Lease liabilities	36	144	453	1,613	3,214
Other financial liabilities	90,334	1,655	2,023	453	15
Off-balance sheet loan commitments	192,286	0	0	0	0
Financial guarantees	28,083	0	0	0	0
Total⁴	1,061,314	190,698	118,696	94,546	39,135

¹ Trading liabilities and derivatives not qualifying for hedge accounting balances are recorded at fair value. The Group believes that this best represents the cash flow that would have to be paid if these positions had to be closed out. Trading liabilities and derivatives not qualifying for hedge accounting balances are shown within "on demand" which Group's management believes most accurately reflects the short-term nature of trading activities. The contractual maturity of the instruments may however extend over significantly longer periods.

² These are investment contracts where the policy terms and conditions result in their redemption value equaling fair value.

³ Derivatives designated for hedge accounting are recorded at fair value and are shown in the time bucket at which the hedged relationship is expected to terminate.

⁴ The balances in the table do not agree to the numbers in the Group's balance sheet as the cash flows included in the table are undiscounted. This analysis represents the worst case scenario for the Group if the Group was required to repay all liabilities earlier than expected. The Group believes that the likelihood of such an event occurring is remote.

	Dec 31, 2021				
in € m.	On demand	Due within 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years
Noninterest bearing deposits	226,091	0	0	0	0
Interest bearing deposits	169,144	118,909	71,020	12,195	10,015
Trading liabilities ¹	54,676	0	0	0	0
Negative market values from derivative financial instruments ¹	287,109	0	0	0	0
Financial liabilities designated at fair value through profit or loss	30,911	7,582	16,764	2,249	2,438
Investment contract liabilities ²	0	0	562	0	0
Negative market values from derivative financial instruments qualifying for hedge accounting ³	0	678	423	286	79
Central bank funds purchased	0	0	0	0	0
Securities sold under repurchase agreements	227	33	40	448	8
Securities loaned	24	0	0	0	0
Other short-term borrowings	2,676	953	607	0	0
Long-term debt	0	36,692	14,770	71,239	31,449
Trust preferred securities	0	0	529	0	0
Lease liabilities	37	142	503	1,750	2,082
Other financial liabilities	78,311	3,225	337	456	12
Off-balance sheet loan commitments	175,114	0	0	0	0
Financial guarantees	24,024	0	0	0	0
Total⁴	1,048,344	168,213	105,556	88,623	46,083

¹ Trading liabilities and derivatives not qualifying for hedge accounting balances are recorded at fair value. The Group believes that this best represents the cash flow that would have to be paid if these positions had to be closed out. Trading liabilities and derivatives not qualifying for hedge accounting balances are shown within "on demand" which Group's management believes most accurately reflects the short-term nature of trading activities. The contractual maturity of the instruments may however extend over significantly longer periods.

² These are investment contracts where the policy terms and conditions result in their redemption value equaling fair value.

³ Derivatives designated for hedge accounting are recorded at fair value and are shown in the time bucket at which the hedged relationship is expected to terminate.

⁴ The balances in the table do not agree to the numbers in the Group's balance sheet as the cash flows included in the table are undiscounted. This analysis represents the worst case scenario for the Group if the Group was required to repay all liabilities earlier than expected. The Group believes that the likelihood of such an event occurring is remote.

Additional Notes

32 – Common Shares

Common Shares

Deutsche Bank's share capital consists of common shares issued in registered form without par value. Under German law, each share represents an equal stake in the subscribed capital. Therefore, each share has a nominal value of € 2.56, derived by dividing the total amount of share capital by the number of shares.

Number of shares	Issued and fully paid	Treasury shares	Outstanding
Common shares, January 1, 2021	2,066,773,131	(1,346,166)	2,065,426,965
Shares issued under share-based compensation plans	0	0	0
Capital increase	0	0	0
Shares purchased for treasury	0	(35,979,884)	(35,979,884)
Shares sold or distributed from treasury	0	36,647,102	36,647,102
Common shares, December 31, 2021	2,066,773,131	(678,948)	2,066,094,183
Shares issued under share-based compensation plans	0	0	0
Capital increase	0	0	0
Shares purchased for treasury	0	(55,830,172)	(55,830,172)
Shares sold or distributed from treasury	0	27,577,502	27,577,502
Common shares, December 31, 2022	2,066,773,131	(28,931,618)	2,037,841,513

There are no issued ordinary shares that have not been fully paid.

The Group has bought back shares pursuant to share buyback authorizations by the Annual General Meetings. All such transactions were recorded in shareholders' equity and no revenues and expenses were recorded in connection with these activities. Treasury stock held as of year-end will mainly be used for cancellation with the purpose of distributing capital to shareholders as well as for future share-based compensation.

Authorized Capital

The Management Board is authorized to increase the share capital by issuing new shares for cash consideration. As of December 31, 2022, Deutsche Bank AG had authorized but unissued capital of € 2,560,000,000 which may be issued in whole or in part until April 30, 2026. Further details are governed by Section 4 of the Articles of Association.

Authorized capital	Consideration	Pre-emptive rights	Expiration date
€ 512,000,000	Cash	May be excluded pursuant to Section 186 (3) sentence 4 of the Stock Corporation Act and may be excluded in so far as it is necessary to grant pre-emptive rights to the holders of option rights, convertible bonds, and convertible participatory rights	April 30, 2026
€ 2,048,000,000	Cash	May be excluded in so far as it is necessary to grant pre-emptive rights to the holders of option rights, convertible bonds, and convertible participatory rights.	April 30, 2026

Conditional Capital

The Management Board was authorized to issue once or more than once, participatory notes that are linked with conversion rights or option rights and/or convertible bonds and/or bonds with warrants. The participatory notes, convertible bonds or bonds with warrants could also be issued by affiliated companies of Deutsche Bank AG. For this purpose, share capital was increased conditionally upon exercise of these conversion and/or exchange rights or upon mandatory conversion.

Conditional capital	Purpose of conditional capital	Expiration date
€ 512,000,000	May be used if holders of conversion or option rights that are linked with participatory notes or convertible bonds or bonds with warrants make use of their conversion or option rights or holders with conversion obligations of convertible participatory notes or convertible bonds fulfill their obligation to convert.	April 30, 2022
€ 51,200,000	May be used to fulfill options that are awarded on or before the expiration date and will only be used to the extent that holders of issued options make use of their right to receive shares and shares are not delivered out of treasury shares	April 30, 2022

The authorizations expired unused on April 30, 2022. Other conditional capital does not exist.

Dividends

The following table presents the amount of dividends proposed or declared for the years ended December 31, 2022, 2021 and 2020, respectively.

	2022 (proposed)	2021	2020
Cash dividends declared (in €)	611,352,454	413,000,000	0
Cash dividends declared per common share (in €)	0.30	0.20	0.00

No dividends have been declared since the balance sheet date.

33 – Employee Benefits

Share-Based Compensation Plans

The Group made grants of share-based compensation under the Deutsche Bank Equity Plan. This plan represents a contingent right to receive Deutsche Bank common shares after a specified period of time. The award recipient is not entitled to receive dividends during the vesting period of the award.

The share awards granted under the terms and conditions of the Deutsche Bank Equity Plan may be forfeited fully or partly if the recipient voluntarily terminates employment before the end of the relevant vesting period (or release period for Upfront Awards). Vesting usually continues after termination of employment in cases such as redundancy or retirement. Deferred share awards are subject to forfeiture provisions and performance conditions until release.

In countries where legal or other restrictions hinder the delivery of shares, a cash plan variant of the Deutsche Bank Equity Plan was used for granting awards, and for employees of certain legal entities, deferred equity is replaced with restricted shares due to local regulatory requirements.

Please note that this table does not cover awards granted to the Management Board. For awards granted under the DWS Equity Plan, please refer to the DWS Share-Based Compensation Plans section.

The following table sets forth the basic terms of these share plans:

Grant year(s)	Deutsche Bank Equity Plan	Vesting schedule	Eligibility
2022 ⁴	Annual Award	1/4: 12 months ¹ 1/4: 24 months ¹ 1/4: 36 months ¹ 1/4: 48 months ¹	Select employees as annual performance-based compensation (CB/IB/CRU and InstVV MRTs) ²
	Annual Award	1/3: 12 months ¹ 1/3: 24 months ¹ 1/3: 36 months ¹	Select employees as annual performance-based compensation (non-CB/IB/CRU) ²
	Annual Award	1/5: 12 months ¹ 1/5: 24 months ¹ 1/5: 36 months ¹ 1/5: 48 months ¹ 1/5: 60 months ¹	Select employees as annual performance-based compensation (Senior Management)
	Retention/New Hire	Individual specification	Select employees to attract and retain the best talent
	Severance	Individual specification	Regulatory requirement for certain employees to defer severance payments
	Annual Award – Upfront	Vesting immediately at grant ³	Selected employees
2019-2021 ⁴	Annual Award	1/4: 12 months ¹ 1/4: 24 months ¹ 1/4: 36 months ¹ 1/4: 48 months ¹	Select employees as annual performance-based compensation (CB/IB/CRU and InstVV MRTs in an Material Business Unit) ²
	Annual Award	1/3: 12 months ¹ 1/3: 24 months ¹ 1/3: 36 months ¹	Select employees as annual performance-based compensation (non-CB/IB/CRU) ²
	Annual Award	1/5: 12 months ¹ 1/5: 24 months ¹ 1/5: 36 months ¹ 1/5: 48 months ¹ 1/5: 60 months ¹	Select employees as annual performance-based compensation (Senior Management)
	Retention/New Hire/Off-Cycle ⁵	Individual specification	Select employees to attract and retain the best talent
	Severance	Individual specification	Regulatory requirement for certain employees to defer severance payments
	Annual Award – Upfront	Vesting immediately at grant ³	Regulated employees
2017 -2018 ⁴	Annual Award	1/4: 12 months ¹ 1/4: 24 months ¹ 1/4: 36 months ¹ 1/4: 48 months ¹ Or cliff vesting after 54 months ¹	Select employees as annual performance-based compensation
	Severance	Individual specification	Members of Senior Leadership Cadre Regulatory requirement for certain employees to defer severance payments
	Retention/New Hire/Off-Cycle	Individual specification	Select employees to attract and retain the best talent

¹ For InstVV-regulated employees (and Senior Management) a further retention period of twelve months applies (six months for awards granted from 2017 -2018).

² For grant year 2019 divisions were called CIB, for grant years 2020 and 2021 CIB is split into CB/IB/CRU.

³ Share delivery takes place after a further retention period of twelve months.

⁴ Annual and Retention/New Hire awards include grants made under the Restricted Share Plan from 2018-2022.

⁵ Off-Cycle awards granted up to 2020.

Furthermore, the Group offers a broad-based employee share ownership plan entitled Global Share Purchase Plan. The Global Share Purchase Plan offers employees in specific countries the opportunity to purchase Deutsche Bank shares in monthly installments over one year. At the end of the purchase cycle, the Group matches the acquired stock in a ratio of one to one up to a maximum of ten free shares, provided that the employee remains at Deutsche Bank Group for another year. In total, 11,451 staff from 18 countries enrolled in the cycle that began in November 2022.

The Group has other local share-based compensation plans, none of which, individually or in the aggregate, are material to the consolidated financial statements.

The following table sets out the movements in share award units, including grants under the cash plan variant of the Deutsche Bank Equity Plan.

Share units (in thousands)	2022	2021
Balance outstanding as of January 01	121,818	119,206
Granted	45,114	50,554
Released	(34,121)	(43,206)
Forfeited	(4,872)	(4,537)
Other movements	(411)	(200)
Balance outstanding as of December 31	127,528	121,818

The following table sets out key information regarding awards granted, released and remaining in the year.

	2022			2021		
	Weighted average fair value per award granted in year	Weighted average share price at release in year	Weighted average remaining contractual life in years	Weighted average fair value per award granted in the year	Weighted average share price at release in year	Weighted average remaining contractual life in years
DB Equity Plan	€ 9.53	€ 10.04	1.5	€ 9.25	€ 10.58	1.7

Share-based payment transactions resulting in a cash payment give rise to a liability, which amounted to approximately € 9 million and € 8 million for the years ended December 31, 2022 and 2021, respectively.

The grant volume of outstanding share awards was approximately € 1.0 billion and € 0.9 billion as of December 31, 2022 and 2021, respectively. Thereof, approximately € 0.8 billion and € 0.7 billion had been recognized as compensation expense in the reporting year or prior to that. Hence, compensation expense for deferred share-based compensation not yet recognized amounted to approximately € 0.2 billion and € 0.2 billion as of December 31, 2022 and 2021, respectively.

DWS Share-Based Compensation Plans

The DWS Group made grants of share-based compensation under the DWS Equity Plan. This plan represents a contingent right to receive a cash payment by referencing to the value of DWS shares during a specified time period.

In September 2018 one-off IPO related awards under the DWS Stock Appreciation Rights (SAR) Plan were granted to all DWS employees. A limited number of DWS senior managers were granted a one-off IPO-related Performance Share Unit under the DWS Equity Plan instead. For members of the Executive Board, one-off IPO-related awards under the DWS Equity Plan were granted in January 2019.

The DWS Stock Appreciation Rights Plan represents a contingent right to receive a cash payment equal to any appreciation (or gain) in the value of a set number of notional DWS shares over a fixed period of time. This award does not provide any entitlement to receive DWS shares, voting rights or associated dividends.

The DWS Equity Plan is a phantom share plan representing a contingent right to receive a cash payment by referencing to the value of DWS shares during a specified period of time.

The award recipient for any share-based compensation plan is not entitled to receive dividends during the vesting period of the award.

The share awards granted under the terms and conditions of any share-based compensation plan are forfeited fully or partly if the recipient voluntarily terminates employment before the end of the relevant vesting period (or the end of the retention period for Upfront Awards). Vesting usually continues after termination of employment in cases such as redundancy or retirement.

The following table sets forth the basic terms of the DWS share-based plans:

Grant year(s)	Award Type	Vesting schedule	Eligibility
2021-2022	Annual Awards	1/4: 12 months ¹ 1/4: 24 months ¹ 1/4: 36 months ¹ 1/4: 48 months ¹	Select employees as annual performance-based compensation (InstVV MRTs)
	Annual Awards	1/3: 12 months ¹ 1/3: 24 months ¹ 1/3: 36 months ¹	Select employees as annual performance-based compensation (non-InstVV MRTs)
	Annual Awards (Senior Management)	1/5: 12 months ¹ 1/5: 24 months ¹ 1/5: 36 months ¹ 1/5: 48 months ¹ 1/5: 60 months ¹	Members of the Executive Board
	Annual Award - Upfront	Vesting immediately at grant ¹	Regulated employees
	Retention/New Hire/Off-Cycle ⁴	Individual specification	Select employees to attract and retain the best talent
2019-2020	Annual Awards	1/3: 12 months ¹ 1/3: 24 months ¹ 1/3: 36 months ¹	Select employees as annual performance-based compensation
	Annual Awards (Senior Management)	1/5: 12 months ¹ 1/5: 24 months ¹ 1/5: 36 months ¹ 1/5: 48 months ¹ 1/5: 60 months ¹	Members of the Executive Board
	Annual Award - Upfront	Vesting immediately at grant ¹	Regulated employees
	Retention/New Hire/Off-Cycle ⁴	Individual specification	Select employees to attract and retain the best talent
	Severance	Individual specification	Regulatory requirement for certain employees to defer severance payments
	Performance Share Unit Award (one-off IPO related award granted in 2019)	1/3: March 2022 ¹ 1/3: March 2023 ¹ 1/3: March 2024 ¹	Members of the Executive Board
2018	Retention/New Hire	Individual specification	Select employees to attract and retain the best talent
	Performance Share Unit Award (one-off IPO related award)	1/3: March 2022 ¹ 1/3: March 2023 ¹ 1/3: March 2024 ¹	Select Senior Managers
	SAR Award (one-off IPO related award)	For non-MRTs: 1 June 2021 ³ For MRTs: 1 March 2023 ^{1,3}	all DWS employees ²

¹ Depending on their individual regulatory status, a six month retention period (AIFMD/UCITS MRTs) or a twelve month retention period (InstVV MRTs) applies after vesting.

² Unless the employee received Performance Share Unit Award.

³ For outstanding awards, a 4-year exercise period applies following vesting/retention period.

⁴ Off-Cycle awards to non-InstVV regulated employees only.

The following table sets out the movements in share award units.

	DWS Equity Plan				DWS SAR Plan	
	2022	2021	2022	2021	2022	2021
Share units (in thousands)	Number of Awards	Number of Awards	Number of Awards	Weighted-average exercise price	Number of Awards	Weighted-average exercise price
Outstanding at beginning of year	2,415	2,418	948	€ 24.65	1,254	€ 24.65
Granted	1,005	709	0	-	0	-
Issued or Exercised	(1,042)	(583)	(40)	€ 24.65	(256)	€ 24.65
Forfeited	(55)	(110)	(4)	€ 24.65	(14)	€ 24.65
Expired	0	0	(16)	€ 24.65	(36)	€ 24.65
Other Movements	6	(18)	(1)	€ 24.65	0	€ 24.65
Outstanding at end of year	2,329	2,415	887	€ 24.65	948	€ 24.65
Of which, exercisable	0	0	678	€ 24.65	739	€ 24.65

The following table sets out key information regarding awards granted, released and remaining in the year.

	2022			2021		
	Weighted average fair value per award granted in year	Weighted average share price at release/ exercise in year	Weighted average remaining contractual life in years	Weighted average fair value per award granted in the year	Weighted average share price at release/ exercise in year	Weighted average remaining contractual life in years
DWS Equity Plan	€ 27.67	€ 29.24	1.3	€ 30.44	€ 37.24	1.7
DWS SAR Plan	n/a	€ 31.89	3.0	n/a	€ 39.59	4.0

The fair value of outstanding share-based awards was approximately € 67 million and € 83 million as of December 31, 2022 and 2021, respectively. Of the awards, approximately € 58 million and € 69 million has been recognized in the income statement up to the period ending 2022 and 2021 respectively, of which € 25 million and € 29 million as of December 31, 2022 and 2021 relate to fully vested awards. Total unrecognized expense related to share-based plans was approximately € 10 million and € 14 million as of December 31, 2022 and 2021 respectively, dependent on future share price development.

The fair value of the DWS Stock Appreciation Rights Plan awards have been measured using the generalized Black-Scholes model. The liabilities incurred are re-measured at the end of each reporting period until settlement. The principal inputs being the market value on reporting date, discounted for any dividends foregone over the holding periods of the award, and adjustment for expected and actual levels of vesting which includes estimating the number of eligible employees leaving the Group and number of employees eligible for early retirement. The inputs used in the measurement of the fair values at grant date and measurement date were as follows.

	Measurement date Dec 31, 2022	Measurement date Dec 31, 2021
Units (in thousands)	887	948
Fair value	€ 7.65	€ 10.99
Share price	€ 30.36	€ 35.48
Exercise price	€ 24.65	€ 24.65
Expected volatility (weighted-average)	32%	32%
Expected life (weighted-average) in years	3.0	4.0
Expected dividends (% of income)	66%	65%

Given the limited trading in the market of implied DWS share price volatility, the expected volatility of the DWS share price has been based on an evaluation of the historical volatility for a comparable peer group over the preceding 5-year period. The expected dividend level is linked to the latest DWS Group communication.

Post-employment Benefit Plans

Nature of Plans

The Group sponsors a number of post-employment benefit plans on behalf of its employees, both defined contribution plans and defined benefit plans. The Group's plans are accounted for based on the nature and substance of the plan. Generally, for defined benefit plans the value of a participant's accrued benefit is based on each employee's remuneration and length of service; contributions to defined contribution plans are typically based on a percentage of each employee's remuneration. The rest of this note focuses predominantly on the Group's defined benefit plans.

The Group's defined benefit plans are primarily described on a geographical basis, reflecting differences in the nature and risks of benefits, as well as in the respective regulatory environments. In particular, the requirements set by local regulators can vary significantly and determine the design and financing of the benefit plans to a certain extent. Key information is also shown based on participant status, which provides a broad indication of the maturity of the Group's obligations.

	Dec 31, 2022				
in € m.	Germany	UK	U.S.	Other	Total
Defined benefit obligation related to					
Active plan participants	3,193	287	218	593	4,291
Participants in deferred status	1,827	1,375	523	83	3,808
Participants in payment status	5,017	1,214	461	207	6,899
Total defined benefit obligation	10,037	2,876	1,202	884	14,999
Fair value of plan assets	10,351	3,768	996	962	16,077
Funding ratio (in %)	103 %	131 %	83 %¹	109 %	107 %

¹ US Total defined benefit obligation is inclusive of the unfunded US Medicare Plan (€ 120 million) in addition to defined benefit pension plans. The US defined benefit pension funding ratio excluding Medicare is 92 %.

	Dec 31, 2021				
in € m.	Germany	UK	U.S.	Other	Total
Defined benefit obligation related to					
Active plan participants	4,626	632	243	635	6,136
Participants in deferred status	2,535	3,020	564	118	6,237
Participants in payment status	5,936	1,277	544	274	8,031
Total defined benefit obligation	13,097	4,929	1,351	1,027	20,404
Fair value of plan assets	12,642	6,019	1,148	1,079	20,888
Funding ratio (in %)	97 %	122 %	85 %¹	105 %	102 %

¹ US Total defined benefit obligation is inclusive of the unfunded US Medicare Plan (€ 170 million) in addition to defined benefit pension plans. The US defined benefit pension funding ratio excluding Medicare is 97 %.

The majority of the Group's defined benefit plan obligations relate to Germany, the United Kingdom and the United States. Within the other countries, the largest obligation relates to Switzerland. In Germany and some continental European countries, post-employment benefits are usually agreed on a collective basis with respective employee workers councils, unions or their equivalent. The Group's main pension plans are governed by boards of trustees, fiduciaries or their equivalent.

Post-employment benefits can form an important part of an employee's total remuneration. The Group's approach is that their design shall be attractive to employees in the respective market, but sustainable for the Group to provide over the longer term. At the same time, the Group tries to limit its risks related to provision of such benefits. Consequently, the Group has moved to offer defined contribution plans in many locations over recent years.

In the past the Group typically offered pension plans based on final pay prior to retirement. These types of benefits still form a significant part of the pension obligations for participants in deferred and payment status. Currently, in Germany and the United States, the main defined benefit pension plans for active staff are cash account type plans where the Group credits an annual amount to individual accounts based on an employee's current compensation. Dependent on the plan rules, the accounts increase either at a fixed interest rate or participate in market movements of certain underlying investments to limit the investment risk for the Group. Sometimes, in particular in Germany, there is a guaranteed benefit amount within the plan rules, e.g. payment of at least the amounts contributed. Upon retirement, beneficiaries may usually opt for a lump sum, a fixed number of annual instalments or for conversion of the accumulated account balance into a life annuity. This conversion is often based on market conditions and mortality assumptions at retirement.

The Group also sponsors retirement and termination indemnity plans in several countries, as well as some post-employment medical plans for a number of current and retired employees, mainly in the United States. The post-employment medical plans typically pay fixed percentages of medical expenses of eligible retirees after a set deductible has been met. In the United States, once a retiree is eligible for Medicare, the Group contributes to a Health Reimbursement Account and the retiree is no longer eligible for the Group's medical program. The Group's total defined benefit obligation for post-employment medical plans was € 144 million and € 201 million at December 31, 2022 and December 31, 2021, respectively. In combination with the benefit structure, these plans represent limited risk for the Group, given the nature and size of the post-retirement medical plan liabilities versus the size of the Group's balance sheet at year end 2022.

The following amounts of expected benefit payments from the Group's defined benefit plans include benefits attributable to employees' past and estimated future service and include both amounts paid from the Group's external pension trusts and paid directly by the Group in respect of unfunded plans.

in € m.	Germany	UK	U.S.	Other	Total
Actual benefit payments 2022	485	131	92	67	775
Benefits expected to be paid 2023	522	151	84	71	828
Benefits expected to be paid 2024	528	127	85	71	811
Benefits expected to be paid 2025	550	138	86	66	840
Benefits expected to be paid 2026	564	146	90	64	864
Benefits expected to be paid 2027	582	161	90	65	898
Benefits expected to be paid 2028 – 2032	3,165	917	456	331	4,869
Weighted average duration of defined benefit obligation (in years)	13	16	9	9	12

Multi-employer Plans

In Germany, the Group is a member of the BVV Versicherungsverein des Bankgewerbes a.G. (BVV) together with other financial institutions. The BVV offers retirement benefits to eligible employees in Germany as a complement to post-employment benefit promises of the Group. Both employers and employees contribute on a regular basis to the BVV. The BVV provides annuities of a fixed amount to individuals on retirement and increases these fixed amounts if surplus assets arise within the plan. According to legislation in Germany, the employer is ultimately liable for providing the benefits to its employees. An increase in benefits may also arise due to additional obligations to retirees for the effects of inflation. BVV is a multi-employer defined benefit plan. However, in line with industry practice, the Group accounts for it as a defined contribution plan since insufficient information is available to identify assets and liabilities relating to the Group's current and former employees, primarily because the BVV does not fully allocate plan assets to beneficiaries nor to member companies.

Governance and Risk

The Group maintains a Pensions Committee to oversee its pension and related risks on a global basis. This Committee meets at least quarterly and reports directly to the Senior Executive Compensation Committee.

Within this context, the Group develops and maintains guidelines for governance and risk management, including funding, asset allocation and actuarial assumption setting.

During and after acquisitions or changes in the external environment (e.g., legislation, taxation), topics such as the general plan design or potential plan amendments are considered. Any plan changes follow a process requiring approval by Group Human Resources and, above a certain threshold, also of the Pensions Committee.

Pension risk management is embedded in the Group's risk management organization, with strong focus on market risks given importance of capital market developments (e.g., interest rate, credit spread, price inflation) for the value of plan assets and liabilities, hence IFRS and regulatory capital. Risk management thereby encompasses regular measurement, monitoring and reporting of risks via specific metrics, as well as a risk control framework, e.g. via the establishment of risk limits or thresholds as applicable. Risk management activities also include the consideration, review and measurement of other financial risks, e.g. risks from demographic and other actuarial assumptions (e.g., longevity risk) but also the assessment of model, valuation and other non-financial risks.

In the Group's key pension countries, the Group's largest post-employment benefit plan risk exposures relate to potential changes in credit spreads, interest rates, price inflation and longevity, that are partially mitigated through the investment strategy adopted. To the extent that pension plans are funded, the assets held mitigate some of the liability risks, but introduce investment risk.

Overall, the Group seeks to minimize the impact of pensions on the Group's financial position from market movements, subject to balancing the trade-offs involved in financing post-employment benefits, regulatory capital and constraints from local funding or accounting requirements.

Funding

The Group maintains various external pension trusts to fund the majority of its defined benefit plan obligations. The Group's funding principle is to maintain funding of the defined benefit obligation by plan assets within a range of 90 % to 100 % of the obligation, subject to meeting any local statutory requirements. The Group has also determined that certain plans should remain unfunded, although their funding approach is subject to periodic review, e.g. when local regulations or practices change. Obligations for the Group's unfunded plans are accrued on the balance sheet.

For many of the externally funded defined benefit plans there are local minimum funding requirements. The Group can decide on any additional plan contributions, with reference to the Group's funding principle. There are some locations, e.g. the United Kingdom, where the trustees and the Group jointly agree contribution levels. In most countries the Group expects to receive an economic benefit from any plan surpluses of plan assets compared to defined benefit obligations, typically by way of reduced future contributions. Given the relatively high funding level and the investment strategy adopted in the Group's key funded defined benefit plans, any minimum funding requirements that may apply are not expected to place the Group under any material adverse cash strain in the short term. With reference to the Group's funding principle, the Group considers not re-claiming benefits paid from the Group's assets as an equivalent to making cash contributions into the external pension trusts during the year.

During 2022, the majority of the German pension plans moved into surplus status due to significant market movements. The Group has claimed around € 860 million from the trust, which represents the benefits paid from the Bank's assets on behalf of the trust during 2022 including the forgiven re-imbursement of the prior year in order to limit the extent to which the Group breached the upper end of its target funding ratio.

For post-retirement medical plans, the Group accrues for obligations over the period of employment and pays the benefits from Group assets when the benefits become due.

Actuarial Methodology and Assumptions

December 31 is the measurement date for all plans. All plans are valued by independent qualified actuaries using the projected unit credit method. A Group policy provides guidance to ensure consistency globally on setting actuarial assumptions which are finally determined by the Group's Pensions Committee. Senior management of the Group is regularly informed of movements and changes in key actuarial assumptions.

The key actuarial assumptions applied in determining the defined benefit obligations at December 31 are presented below in the form of weighted averages.

	Dec 31, 2022				Dec 31, 2021			
	Germany	UK	U.S. ¹	Other	Germany	UK	U.S. ¹	Other
Discount rate (in %)	3.80 %	4.77 %	5.34 %	3.99 %	1.10 %	1.86 %	2.73 %	1.92 %
Rate of price inflation (in %)	2.62 %	3.71 %	2.20 %	2.16 %	2.19 %	3.73 %	2.30 %	1.88 %
Rate of nominal increase in future compensation levels (in %)	2.81 %	3.71 %	2.30 %	3.14 %	2.42 %	4.23 %	2.40 %	2.69 %
Rate of nominal increase for pensions in payment (in %)	2.97 %	3.32 %	2.20 %	0.85 %	2.10 %	3.49 %	2.30 %	1.05 %
Assumed life expectancy at age 65								
For a male aged 65 at measurement date	21.3	23.6	22.0	22.0	21.3	23.5	21.9	22.0
For a female aged 65 at measurement date	23.6	25.4	23.4	24.1	23.5	25.1	23.3	24.0
For a male aged 45 at measurement date	22.6	24.9	23.3	23.5	22.6	24.6	23.3	23.4
For a female aged 45 at measurement date	24.7	26.7	24.8	25.5	24.6	26.5	24.7	25.4
Mortality tables applied								
	Modified Richttafeln Heubeck 2018G	SAPS (S3) Light/ Very Light with CMI 2021 projections	PRI-2012 with MP-2021 projection	Country specific tables	Modified Richttafeln Heubeck 2018G	SAPS (S3) Light/ Very Light with CMI 2020 projections	PRI-2012 with MP-2021 projection	Country specific tables

¹ Cash balance interest crediting rate in line with the 30-year US government bond yield.

For the Group's most significant pension plans in the key countries, the discount rate used at each measurement date is set based on a high quality corporate bond yield curve, which is derived using a bond universe sourced from reputable third-party market data providers, and reflects the timing, amount and currency of the future expected benefit payments for the respective plan. In the second quarter 2022, a recalibration of the discount curve for defined benefit plans was applied to the Eurozone curve in order to better align to market data which resulted in a benefit recognised in Other Comprehensive Income of € 310 million.

The price inflation assumptions in the Eurozone and the United Kingdom are set with reference to market measures of inflation based on inflation swap rates in those markets at each measurement date. For other countries, the price inflation assumptions are typically based on long term forecasts by Consensus Economics Inc.

The assumptions for the increases in future compensation levels and for increases to pensions in payment are developed separately for each plan, where relevant. Each is set based on the price inflation assumption and reflecting the Group's reward structure or policies in each market, as well as relevant local statutory and plan-specific requirements.

Among other assumptions, mortality assumptions can be significant in measuring the Group's obligations under its defined benefit plans. These assumptions have been set in accordance with current best estimate in the respective countries. Future potential improvements in longevity have been considered and included where appropriate. Due to the long-term nature of mortality assumptions and lack of clarity over the longer term impacts of the pandemic on health outcomes, there has been no specific allowance for the impact of COVID-19 in any region, other than for recent experience which was captured as part of the annual valuation process.

Reconciliation in Movement of Liabilities and Assets – Impact on Financial Statements

in € m.	2022				
	Germany	UK	U.S.	Other	Total
Change in the present value of the defined benefit obligation:					
Balance, beginning of year	13,097	4,929	1,351	1,027	20,404
Defined benefit cost recognized in Profit & Loss					
Current service cost	164	18	10	38	230
Interest cost	142	88	39	20	289
Past service cost and gain or loss arising from settlements	17	2	0	0	19
Defined benefit cost recognized in Other Comprehensive Income					
Actuarial gain or loss arising from changes in financial assumptions	(3,055)	(1,966)	(196)	(183)	(5,400)
Actuarial gain or loss arising from changes in demographic assumptions	80	29	(5)	0	104
Actuarial gain or loss arising from experience	79	97	3	25	204
Cash flow and other changes					
Contributions by plan participants	1	0	0	16	17
Benefits paid	(485)	(131)	(92)	(67)	(775)
Payments in respect to settlements	0	0	0	0	0
Acquisitions/Divestitures	(2)	0	0	(2)	(4)
Exchange rate changes	0	(190)	92	9	(89)
Other	(0)	0	0	0	0
Balance, end of year	10,037	2,876	1,202	884	14,999
thereof:					
Unfunded	0	10	143	75	228
Funded	10,037	2,866	1,059	809	14,771
Change in fair value of plan assets:					
Balance, beginning of year	12,642	6,019	1,148	1,079	20,888
Defined benefit cost recognized in Profit & Loss					
Interest income	139	108	33	19	299
Defined benefit cost recognized in Other Comprehensive Income					
Return from plan assets less interest income	(1,594)	(1,982)	(184)	(130)	(3,890)
Cash flow and other changes					
Contributions by plan participants	1	0	0	16	17
Contributions by the employer ¹	(353)	0	0	28	(325)
Benefits paid ²	(485)	(130)	(77)	(60)	(752)
Payments in respect to settlements	0	0	0	0	0
Acquisitions/Divestitures	1	0	0	(1)	0
Exchange rate changes	0	(243)	79	11	(153)
Other	0	0	0	0	0
Plan administration costs	0	(4)	(3)	0	(7)
Balance, end of year	10,351	3,768	996	962	16,077
Funded status, end of year	314	892	(206)	78	1,078
Change in irrecoverable surplus (asset ceiling)					
Balance, beginning of year	0	0	0	(90)	(90)
Interest cost	0	0	0	0	0
Changes in irrecoverable surplus	0	0	0	(12)	(12)
Exchange rate changes	0	0	0	(5)	(5)
Balance, end of year	0	0	0	(107)	(107)
Net asset (liability) recognized	314	892	(206)	(29)	971³
Fair value of reimbursement rights	0	0	0	3	3

¹ Net Amount includes re-imbursement of 2022 benefit payments and a forgiven benefit payment from 2021.

² For funded plans only.

³ Thereof € 1,326 million recognized in Other assets and € 355 million in Other liabilities.

	2021			
in € m.	Germany	UK	U.S.	Other
Change in the present value of the defined benefit obligation:				
Balance, beginning of year	13,532	4,917	1,327	1,031
Defined benefit cost recognized in Profit & Loss				
Current service cost	177	23	10	40
Interest cost	80	63	31	16
Past service cost and gain or loss arising from settlements	28	(15)	0	(1)
Defined benefit cost recognized in Other Comprehensive Income				
Actuarial gain or loss arising from changes in financial assumptions	(319)	(220)	(50)	(21)
Actuarial gain or loss arising from changes in demographic assumptions	0	(5)	3	(14)
Actuarial gain or loss arising from experience	75	(16)	20	1
Cash flow and other changes				
Contributions by plan participants	1	0	0	14
Benefits paid ¹	(477)	(134)	(87)	(67)
Payments in respect to settlements	0	0	0	0
Acquisitions/Divestitures	0	0	0	0
Exchange rate changes	0	316	97	28
Other	0	0	0	0
Balance, end of year	13,097	4,929	1,351	1,027
thereof:				
Unfunded	0	14	197	90
Funded	13,097	4,915	1,154	937
Change in fair value of plan assets:				
Balance, beginning of year	12,658	5,705	1,107	987
Defined benefit cost recognized in Profit & Loss				
Interest income	76	74	26	14
Defined benefit cost recognized in Other Comprehensive Income				
Return from plan assets less interest income	243	5	7	46
Cash flow and other changes				
Contributions by plan participants	1	0	0	14
Contributions by the employer	141	0	4	32
Benefits paid ¹	(477)	(134)	(75)	(52)
Payments in respect to settlements	0	0	0	0
Acquisitions/Divestitures	0	0	0	0
Exchange rate changes	0	374	82	39
Other	0	0	0	0
Plan administration costs	0	(5)	(3)	(1)
Balance, end of year	12,642	6,019	1,148	1,079
Funded status, end of year	(455)	1,090	(203)	52
Change in irrecoverable surplus (asset ceiling)				
Balance, beginning of year	0	0	0	(38)
Interest cost	0	0	0	0
Changes in irrecoverable surplus	0	0	0	(48)
Exchange rate changes	0	0	0	(4)
Balance, end of year	0	0	0	(90)
Net asset (liability) recognized	(455)	1,090	(203)	(38)
Fair value of reimbursement rights	0	0	0	0

¹ For funded plans only.

² Thereof € 1,207 million recognized in Other assets and € 813 million in Other liabilities.

The Group has a reimbursement right of around € 3 million domiciled in France at 31 December, 2022. This relates to the surplus of the previous CRPB Fund which was identified in 2022 that can be used to fund the retirement indemnity payments for the DB AG Branch Paris. There are no other reimbursement rights for the Group.

Investment Strategy

The Group's investment objective is to protect the Group from adverse impacts of its defined benefit pension plans on key financial metrics. The primary focus is to protect the plans' IFRS funded status in the case of adverse market scenarios. Since 2021, there has been a shift in the investment strategy in selected markets to balance competing key financial metrics. Investment managers manage pension assets in line with investment mandates or guidelines as agreed with the pension plans' trustees and investment committees.

For key defined benefit plans for which the Group aims to protect the IFRS funded status, the Group applies a liability driven investment approach. Risks from mismatches between fluctuations in the present value of the defined benefit obligations and plan assets due to capital market movements are minimized, subject to balancing relevant trade-offs. This is achieved by allocating plan assets closely to the market risk factor exposures of the pension liability to interest rates, credit spreads and inflation. Thereby, plan assets broadly reflect the underlying risk profile and currency of the pension obligations.

Where the desired hedging level for market risks cannot be achieved with physical instruments (i.e., corporate and government bonds), derivatives are employed. Derivative overlays mainly include interest rate, inflation swaps and credit default swaps. Other instruments are also used, such as interest rate futures and options. In practice, a completely hedged approach is impractical, for instance because of insufficient market depth for ultra-long-term corporate bonds, as well as liquidity and cost considerations. Therefore, plan assets contain further return-seeking asset categories such as equity, real estate, high yield bonds or emerging markets bonds to create long-term value and achieve diversification benefits. Furthermore, this shift in the investment strategy allows for actively taken market risk exposures from interest rates and credit spreads within defined limits governed by the Pensions Committee. As a result, the market risk from plan assets has been reduced.

In Q3 2022, the Group entered into a buy-in transaction with a third party insurer to de-risk € 410 million of exposure to the UK defined benefit pension schemes funded from existing assets, with no additional employer contribution required. The recognition of the insurance policy as a qualifying plan asset in Q3 negatively impacted Other Comprehensive Income in the Group's financial statement by approximately € 35 million. In total, the Group has entered into three buy-in transactions in the UK with third-party insurers protecting the Group from movements in defined benefit obligations of around € 1.2 billion at 31 December, 2022.

Plan asset allocation to key asset classes

The following table shows the asset allocation of the Group's funded defined benefit plans to key asset classes, i.e. exposures include physical securities in discretely managed portfolios and underlying asset allocations of any commingled funds used to invest plan assets.

Asset amounts in the following table include both “quoted” (i.e., Level 1 assets in accordance with IFRS 13 – amounts invested in markets where the fair value can be determined directly from prices which are quoted in active, liquid markets) and “other” (i.e., Level 2 and 3 assets in accordance with IFRS 13) assets.

in € m.	Dec 31, 2022					Dec 31, 2021				
	Germany	UK	U.S.	Other	Total	Germany	UK	U.S.	Other	Total
Cash and cash equivalents	34	551	56	69	710	930	321	56	78	1,385
Equity instruments ¹	1,046	174	108	186	1,514	1,220	348	151	209	1,928
Investment-grade bonds ²										
Government	1,860	537	346	169	2,912	2,524	1,918	436	207	5,085
Non-government bonds	3,898	1,302	385	315	5,900	5,386	1,894	379	336	7,995
Non-investment-grade bonds										
Government	89	1	2	3	95	137	1	1	1	140
Non-government bonds	282	168	13	17	480	423	142	33	55	653
Securitized and other Debt Investments	45	47	81	7	180	839	124	79	7	1,049
Insurance	0	1,193	0	9	1,202	1	1,256	0	10	1,267
Alternatives										
Real estate	690	0	0	105	795	528	0	0	98	626
Commodities	41	0	0	5	46	25	0	0	5	30
Private equity	0	0	0	2	2	0	0	0	2	2
Other ³	1,008	0	0	51	1,059	46	0	0	50	96
Derivatives (Market Value)										
Interest rate	1,294	229	13	7	1,543	518	42	9	2	571
Credit	6	(112)	7	0	(99)	65	(87)	16	1	(5)
Inflation	0	(14)	0	13	(1)	0	(62)	0	14	(48)
Foreign exchange	55	(5)	0	4	54	(1)	4	0	4	7
Other	3	(303)	(15)	0	(315)	1	118	(12)	0	107
Total fair value of plan assets	10,351	3,768	996	962	16,077	12,642	6,019	1,148	1,079	20,888

¹ Allocation of equity exposure is broadly in line with the typical index in the respective market, e.g. the equity portfolio's benchmark of the UK retirement benefit plans is the MSCI All Countries World Index.

² Investment-grade means BBB and above. Average credit rating exposure for the Group's main plans is around A.

³ This position contains commingled funds which could not be segregated into the other asset categories.

The following table sets out the Group's funded defined benefit plan assets only invested in “quoted” assets, i.e. Level 1 assets in accordance with IFRS 13.

in € m.	Dec 31, 2022					Dec 31, 2021				
	Germany	UK	U.S.	Other	Total	Germany	UK	U.S.	Other	Total
Cash and cash equivalents	(154)	551	55	24	476	756	317	48	34	1,155
Equity instruments ¹	772	173	108	38	1,091	983	348	151	53	1,535
Investment-grade bonds ²										
Government	691	537	340	49	1,617	902	1,902	431	77	3,312
Non-government bonds	0	0	0	0	0	0	0	0	0	0
Non-investment-grade bonds										
Government	0	1	0	0	1	0	0	0	0	0
Non-government bonds	0	0	0	0	0	0	0	0	0	0
Securitized and other Debt Investments	0	45	0	0	45	0	118	0	0	118
Insurance	0	0	0	0	0	0	0	0	0	0
Alternatives										
Real estate	0	0	0	0	0	0	0	0	0	0
Commodities	0	0	0	0	0	0	0	0	0	0
Private equity	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Derivatives (Market Value)										
Interest rate	0	0	(7)	0	(7)	0	0	(16)	0	(16)
Credit	0	0	0	0	0	0	1	0	0	1
Inflation	0	0	0	0	0	0	0	0	14	14
Foreign exchange	0	0	0	0	0	0	2	0	0	2
Other	3	0	0	0	3	1	0	0	0	1
Total fair value of quoted plan assets	1,312	1,307	496	111	3,226	2,642	2,688	614	178	6,122

¹ Allocation of equity exposure is broadly in line with the typical index in the respective market, e.g. the equity portfolio's benchmark of the UK retirement benefit plans is the MSCI All Countries World Index.

² Investment-grade means BBB and above. Average credit rating exposure for the Group's main plans is around A.

The following tables show the asset allocation of the “quoted” and “other” defined benefit plan assets by key geography in which they are invested.

Dec 31, 2022							
in € m.	Germany	United Kingdom	United States	Other Eurozone	Other developed countries	Emerging markets	Total
Cash and cash equivalents	4	387	126	132	31	30	710
Equity instruments	29	43	881	327	172	62	1,514
Government bonds (investment-grade and above)	372	544	402	1,044	106	444	2,912
Government bonds (non-investment-grade)	0	1	0	0	2	92	95
Non-government bonds (investment-grade and above)	347	1,068	1,810	2,100	500	75	5,900
Non-government bonds (non-investment-grade)	16	104	23	327	7	3	480
Securitized and other Debt Investments	32	35	81	21	9	2	180
Subtotal	800	2,182	3,323	3,951	827	708	11,791
Share (in %)	7%	19%	28%	34%	7%	6%	100%
Other asset categories							4,286
Fair value of plan assets							16,077

Dec 31, 2021							
in € m.	Germany	United Kingdom	United States	Other Eurozone	Other developed countries	Emerging markets	Total
Cash and cash equivalents	3	174	88	1,039	45	37	1,386
Equity instruments	36	61	1,182	304	258	87	1,928
Government bonds (investment-grade and above)	860	1,799	500	1,153	222	551	5,085
Government bonds (non-investment-grade)	0	0	0	4	2	134	140
Non-government bonds (investment-grade and above)	500	1,546	2,437	2,873	539	100	7,995
Non-government bonds (non-investment-grade)	46	61	92	438	9	7	653
Securitized and other Debt Investments	23	97	86	31	809	3	1,049
Subtotal	1,468	3,738	4,385	5,842	1,884	919	18,236
Share (in %)	8%	20%	24%	32%	10%	5%	100%
Other asset categories							2,652
Fair value of plan assets							20,888

Plan assets include derivative transactions with Group entities with an overall positive market value of around € 1.3 billion at December 31, 2022 and € 553 million December 31, 2021, respectively. There is neither a material amount of securities issued by the Group nor other claims on Group assets included in the fair value of plan assets. The plan assets do not include any real estate which is used by the Group.

Key Risk Sensitivities

The Group's defined benefit obligations are sensitive to changes in capital market conditions and actuarial assumptions. Sensitivities to capital market movements and key assumption changes are presented in the following table. Each market risk factor or assumption is changed in isolation. Sensitivities of the defined benefit obligations are approximated using geometric extrapolation methods based on plan durations for the respective assumption. Duration is a risk measure that indicates the broad sensitivity of the obligations to a change in an underlying assumption and provides a reasonable approximation for small to moderate changes in those assumptions.

For example, the interest rate duration is derived from the change in the defined benefit obligation to a change in the interest rate based on information provided by the local actuaries of the respective plans. The resulting duration is used to estimate the remeasurement liability loss or gain from changes in the interest rate. For other assumptions, a similar approach is used to derive the respective sensitivity results.

For defined benefit pension plans, changes in capital market conditions will impact the plan obligations via actuarial assumptions (e.g. via the discount rate and price inflation rate) as well as the plan assets' fair value. Where the Group applies a liability driven investment approach or has insured part of the obligations as in the UK, the Group's overall risk exposure to such changes is reduced. To help readers gain a better understanding of the Group's risk exposures to key capital market movements, the net impact of the change in the defined benefit obligations and plan assets due to a change of the related

market risk factor or underlying actuarial assumption is shown. Where changes in actuarial assumptions do not affect plan assets, only the impact on the defined benefit obligations is reported.

Asset-related sensitivities are derived for the Group's major plans by using risk sensitivity factors determined by the Group's Market Risk Management function. These sensitivities are calculated based on information provided by the plans' investment managers and extrapolated linearly to reflect the approximate change of the plan assets' market value in case of a change in the underlying risk factor.

The sensitivities illustrate plausible variations over time in capital market movements and key actuarial assumptions. The Group is not in a position to provide a view on the likelihood of these capital market or assumption changes. While these sensitivities illustrate the overall impact on the funded status of the changes shown, the significance of the impact and the range of reasonable possible alternative assumptions may differ between the different plans that comprise the aggregated results. Even though plan assets and plan obligations are sensitive to similar risk factors, actual changes in plan assets and obligations may not fully offset each other due to imperfect correlations between market risk factors and actuarial assumptions. Caution should be used when extrapolating these sensitivities due to non-linear effects that changes in capital market conditions and key actuarial assumptions may have on the overall funded status. Any management actions that may be taken to mitigate the inherent risks in the post-employment defined benefit plans are not reflected in these sensitivities.

in € m.	Dec 31, 2022				Dec 31, 2021			
	Germany	UK	U.S.	Other	Germany	UK	U.S.	Other
Interest rate (–50 bp):								
(Increase) in DBO	(570)	(225)	(25)	(35)	(915)	(520)	(40)	(60)
Expected increase in plan assets ¹	290	170	25	10	595	350	35	20
Expected net impact on funded status (de-) increase	(280)	(55)	0	(25)	(320)	(170)	(5)	(40)
Interest rate (+50 bp):								
Decrease in DBO	540	210	25	35	855	470	40	55
Expected (decrease) in plan assets ¹	(290)	(170)	(25)	(10)	(595)	(350)	(35)	(20)
Expected net impact on funded status (de-) increase	250	40	0	25	260	120	5	35
Credit spread (–50 bp):								
(Increase) in DBO	(570)	(225)	(55)	(40)	(915)	(520)	(75)	(60)
Expected increase in plan assets ¹	210	65	15	5	595	125	15	10
Expected net impact on funded status (de-) increase	(360)	(160)	(40)	(35)	(320)	(395)	(60)	(50)
Credit spread (+50 bp):								
Decrease in DBO	540	210	50	40	855	470	70	55
Expected (decrease) in plan assets ¹	(210)	(65)	(15)	(5)	(595)	(125)	(15)	(10)
Expected net impact on funded status (de-) increase	330	145	35	35	260	345	55	45
Rate of price inflation (–50 bp):²								
Decrease in DBO	305	140	10	10	370	365	0	20
Expected (decrease) in plan assets ¹	(285)	(115)	0	(5)	(290)	(270)	0	(10)
Expected net impact on funded status (de-) increase	20	25	10	5	80	95	0	10
Rate of price inflation (+50 bp):²								
(Increase) in DBO	(325)	(145)	(5)	(10)	(385)	(365)	0	(25)
Expected increase in plan assets ¹	285	115	0	5	290	270	0	10
Expected net impact on funded status (de-) increase	(40)	(30)	(5)	(5)	(95)	(95)	0	(15)
Rate of real increase in future compensation levels (–50 bp):								
Decrease in DBO, net impact on funded status	30	5	0	10	55	5	0	15
Rate of real increase in future compensation levels (+50 bp):								
(Increase) in DBO, net impact on funded status	(30)	(5)	0	(10)	(55)	(5)	0	(15)
Longevity improvements by 10 %:³								
(Increase) in DBO, net impact on funded status	(215)	(60) ⁴	(20)	(10)	(335)	(160) ⁴	(30)	(15)

¹ Expected changes in the fair value of plan assets contain the simulated impact from the biggest plans in Germany, the UK, the U.S., Channel Islands, Switzerland and Belgium which cover over 99 % of the total fair value of plan assets. The fair value of plan assets for other plans is assumed to be unchanged for this presentation.

² Incorporates sensitivity to changes in pension benefits to the extent linked to the price inflation assumption.

³ Estimated to be equivalent to an increase of around 1 year in overall life expectancy.

⁴ Due to buy-in transaction the net impact on funded status reduces by € 30 million due to expected gains within the plan assets. The reduction was € 30 million for 2021.

Expected cash flows

The following table shows expected cash flows for post-employment benefits in 2023, including contributions to the Group's external pension trusts in respect of funded plans, direct payment to beneficiaries in respect of unfunded plans, as well as contributions to defined contribution plans.

in € m.	2023
	Total
Expected contributions to	
Defined benefit plan assets	150
BVV	55
Other defined contribution plans	260
Expected benefit payments for unfunded defined benefit plans	25
Expected total cash flow related to post-employment benefits	490

Expense of employee benefits

The following table presents a breakdown of specific expenses according to the requirements of IAS 19 and IFRS 2.

in € m.	2022	2021	2020
Expenses for defined benefit plans:			
Service cost ¹	229	234	246
Net interest cost (income)	(10)	0	5
Total expenses defined benefit plans	219	234	251
Expenses for defined contribution plans:			
BVV	57	58	60
Other defined contribution plans	258	244	243
Total expenses for defined contribution plans	315	302	303
Total expenses for post-employment benefit plans	534	536	554
Employer contributions to state-mandated pension plans			
Pensions related payments social security in Germany	214	221	233
Contributions to pension fund for Postbank's postal civil servants	58	66	79
Further pension related state-mandated benefit plans	216	217	245
Total employer contributions to state-mandated benefit plans	488	504	557
Expenses for share-based payments:			
Expenses for share-based payments, equity settled ²	405	455	318
Expenses for share-based payments, cash settled ²	29	35	49
Expenses for cash retention plans²	418	398	329
Expenses for severance payments³	82	184	184

¹ Severance related items under Service Costs are reclassified to Expenses for Severance payments.

² Including expenses for new hire awards and the acceleration of expenses not yet amortized due to the discontinuation of employment including those amounts which are recognized as part of the Group's restructuring expenses.

³ Excluding the acceleration of expenses for deferred compensation awards not yet amortized. Severance related items under Service Costs were reclassified to Expense for Severance payments.

34 – Income Taxes

in € m.	2022	2021	2020
Current tax expense (benefit):			
Tax expense (benefit) for current year	919	847	739
Adjustments for prior years	(132)	14	(46)
Total current tax expense (benefit)	787	861	693
Deferred tax expense (benefit):			
Origination and reversal of temporary differences, unused tax losses and tax credits	381	108	(224)
Effect of changes in tax law and/or tax rate	(19)	(26)	(11)
Adjustments for prior years	(1,256)	(20)	(67)
Total deferred tax expense (benefit)	(894)	62	(302)
Total income tax expense (benefit)	(107)	923	391

Total deferred tax benefit includes benefits from previously unrecognized tax losses (tax credits/deductible temporary differences) and the reversal of previous write-downs of deferred tax assets and expenses arising from write-downs of deferred tax assets, which increased the deferred tax benefit by € 1.4 billion in 2022, decreased the deferred tax expense by € 242 million in 2021, and decreased the deferred tax benefit by € 96 million in 2020.

Difference between applying German statutory (domestic) income tax rate and actual income tax expense/(benefit)

in € m.	2022	2021	2020
Expected tax expense (benefit) at domestic income tax rate of 31.3% (31.3% for 2021 and 31.3% for 2020)	1,705	1,101	314
Foreign rate differential	(115)	(89)	(39)
Tax-exempt gains on securities and other income	(217)	(183)	(181)
Loss (income) on equity method investments	(12)	(11)	(18)
Nondeductible expenses	429	287	293
Impairments of goodwill	(0)	1	0
Changes in recognition and measurement of deferred tax assets ¹	(1,891)	(227)	96
Effect of changes in tax law and/or tax rate	(19)	(26)	(11)
Effect related to share-based payments	(5)	1	(29)
Other ¹	18	69	(34)
Actual income tax expense (benefit)	(107)	923	391

¹ Current and deferred tax expense/(benefit) relating to prior years are mainly reflected in the line items "Changes in recognition and measurement of deferred tax assets" and "Other".

The Group is under continuous examinations by tax authorities in various jurisdictions. "Other" in the preceding table includes the effects of these examinations by the tax authorities.

Changes in recognition and measurement of deferred tax assets in 2022 and 2021 mainly included the effect of the recognition of previously unrecognized deferred tax assets in the U.S. In determining the amount of deferred tax assets, the Group uses historical tax capacity and profitability information and, if relevant, forecasted operating results based upon approved business plans, including a review of the eligible carry-forward periods, available tax planning opportunities and other relevant considerations.

The domestic income tax rate, including corporate tax, solidarity surcharge, and trade tax, used for calculating deferred tax assets and liabilities was 31.3 % for 2022, 2021 and 2020.

Income taxes credited or charged to equity (other comprehensive income/additional paid in capital)

in € m.	2022	2021	2020
Actuarial gains (losses) related to defined benefit plans	(642)	(207)	76
Net fair value gains (losses) attributable to credit risk related to financial liabilities designated as at fair value through profit or loss	(25)	5	6
Financial assets mandatory at fair value through other comprehensive income:			
Unrealized net gains (losses) arising during the period	312	111	(204)
Realized net gains (losses) arising during the period (reclassified to profit or loss)	(61)	68	84
Derivatives hedging variability of cash flows:			
Unrealized net gains (losses) arising during the period	229	(2)	4
Net gains (losses) reclassified to profit or loss	(18)	15	(1)
Other equity movement:			
Unrealized net gains (losses) arising during the period	192	88	(19)
Net gains (losses) reclassified to profit or loss	0	6	14
Income taxes credited (charged) to other comprehensive income	(13)	84	(40)
Other income taxes credited (charged) to equity	25	45	11

Major components of the Group's gross deferred tax assets and liabilities

in € m.	Dec 31, 2022	Dec 31, 2021
Deferred tax assets:		
Unused tax losses	3,946	1,653
Unused tax credits	2	2
Deductible temporary differences:		
Trading activities, including derivatives	5,819	1,869
Employee benefits, including equity settled share based payments	1,653	2,533
Accrued interest expense	1,367	1,428
Loans and borrowings, including allowance for loans	791	892
Leases	865	857
Intangible Assets	43	52
Fair value OCI (IFRS 9)	387	53
Other assets	630	515
Other provisions	81	110
Other liabilities	1	10
Total deferred tax assets pre offsetting	15,585	9,974
Deferred tax liabilities:		
Taxable temporary differences:		
Trading activities, including derivatives	6,164	1,770
Employee benefits, including equity settled share based payments	245	296
Loans and borrowings, including allowance for loans	549	538
Leases	780	774
Intangible Assets	594	501
Fair value OCI (IFRS 9)	70	76
Other assets	371	214
Other provisions	85	82
Other liabilities	40	41
Total deferred tax liabilities pre offsetting	8,898	4,292

Deferred tax assets and liabilities, after offsetting

in € m.	Dec 31, 2022	Dec 31, 2021
Presented as deferred tax assets	7,225	6,180
Presented as deferred tax liabilities	538	498
Net deferred tax assets	6,687	5,682

The change in the balance of deferred tax assets and deferred tax liabilities might not equal the deferred tax expense/(benefit). In general, this is due to (1) deferred taxes that are booked directly to equity, (2) the effects of exchange rate changes on tax assets and liabilities denominated in currencies other than euro, (3) the acquisition and disposal of entities as part of ordinary activities and (4) the reclassification of deferred tax assets and liabilities which are presented otherwise on the face of the balance sheet as components of other assets and liabilities.

In August 2022, the U.S. enacted the corporate alternative minimum tax (Inflation Reduction Act). These new provisions will take effect for the first time in 2023 and will generally apply to the Group's U.S. operations. The corporate alternative minimum tax is imposed at a tax rate of 15 % on profits before tax determined under U.S. Generally Accepted Accounting Principles with some adjustments. To the extent an alternative minimum tax liability may arise in the future, a corresponding deferred tax asset on unused tax credits may generally be recognized, as such liability may be carried forward indefinitely as a tax credit.

Items for which no deferred tax assets were recognized

in € m.	Dec 31, 2022 ¹	Dec 31, 2021 ¹
Deductible temporary differences	(773)	(988)
Not expiring	(9,462)	(10,331)
Expiring in subsequent period	(0)	0
Expiring after subsequent period	(471)	(5,811)
Unused tax losses	(9,933)	(16,142)
Expiring after subsequent period	(0)	(20)
Unused tax credits	(1)	(21)

¹ Amounts in the table refer to deductible temporary differences, unused tax losses and tax credits for federal income tax purposes.

Deferred tax assets were not recognized on these items because it is not probable that future taxable profit will be available against which the unused tax losses, unused tax credits and deductible temporary differences can be utilized.

As of December 31, 2022 and December 31, 2021, the Group recognized deferred tax assets of € 2.4 billion and € 5.4 billion, respectively, that exceeded deferred tax liabilities in entities which have suffered a loss in either the current or preceding period. This is based on management's assessment that it is probable that the respective entities will have taxable profits against which the unused tax losses, unused tax credits and deductible temporary differences can be utilized. In determining the amounts of deferred tax assets to be recognized, management uses historical profitability information and, if relevant, forecasted operating results, based upon approved business plans, including a review of the eligible carry-forward periods, tax planning opportunities and other relevant considerations.

As of December 31, 2022 and December 31, 2021, the Group had temporary differences associated with the Group's parent company's investments in subsidiaries, branches and associates and interests in joint ventures of € 244 million and € 242 million respectively, in respect of which no deferred tax liabilities were recognized.

35 – Derivatives

Derivative financial instruments and hedging activities

Derivative contracts used by the Group include swaps, futures, forwards, options and other similar types of contracts. In the normal course of business, the Group enters into a variety of derivative transactions for sales, market-making and risk management purposes. The Group's objectives in using derivative instruments are to meet customers' risk management needs and to manage the Group's exposure to risks.

In accordance with the Group's accounting policy relating to derivatives and hedge accounting as described in Note 1 "Significant Accounting Policies and Critical Accounting Estimates", all derivatives are carried at fair value in the balance sheet regardless of whether they are held for trading or non-trading purposes.

Derivatives held for sales and market-making purposes

Sales and market-making

The majority of the Group's derivatives transactions relate to sales and market-making activities. Sales activities include the structuring and marketing of derivative products to customers to enable them to take, transfer, modify or reduce current or expected risks. Market-making involves quoting bid and offer prices to other market participants, enabling revenue to be generated based on spreads and volume.

Risk management

The Group uses derivatives in order to reduce its exposure to market risks as part of its asset and liability management. This is achieved by entering into derivatives that hedge specific portfolios of fixed rate financial instruments and forecast transactions as well as strategic hedging against overall balance sheet exposures. The Group actively manages interest rate risk through, among other things, the use of derivative contracts. Utilization of derivative financial instruments is modified from time to time within prescribed limits in response to changing market conditions, as well as to changes in the characteristics and mix of the related assets and liabilities.

Derivatives qualifying for hedge accounting

The Group applies hedge accounting if derivatives meet the specific criteria described in Note 1 "Significant Accounting Policies and Critical Accounting Estimates".

In fair value hedge relationship, the Group uses primarily interest rate swaps and options, in order to protect itself against movements in the fair value of fixed-rate financial instruments due to movements in market interest rates. In a cash flow hedge relationship, the Group uses interest rate swaps in order to protect itself against exposure to variability in interest rates. The Group enters into foreign exchange forwards and swaps for hedges of translation adjustments resulting from translating the financial statements of net investments in foreign operations into the reporting currency of the parent at period end spot rates.

Interest rate risk

The Group uses interest rate swaps and options to manage its exposure to interest rate risk by modifying the re-pricing characteristics of existing and/or forecasted assets and liabilities, including funding and investment activities. The interest rate swaps and options are designated in either a fair value hedge or a cash flow hedge. For fair value hedges, the Group uses interest rate swaps and options contracts to manage the fair value movements of fixed rate financial instruments due to changes in benchmark interest. For cash flow hedges, we use interest rate swaps to manage the exposure to cash flow variability of our variable rate instruments as a result of changes in benchmark interest rates.

The Group manages its interest rate risk exposure on a portfolio basis with frequent changes in the portfolio due to the origination of new loans and bonds, repayments of existing loans and bonds, issuance of new funding liabilities and repayment of existing funding liabilities. Accordingly, a dynamic hedging accounting approach is adopted for the portfolio, in which individual hedge relationships are designated and de-designated on a more frequent basis (e.g. on a monthly basis).

The Group assesses and measures hedge effectiveness of a hedging relationship based on the change in the fair value or cash flows of the derivative hedging instrument relative to the change in the fair value or cash flows of the hedged item attributable to the hedged risk. Potential sources of ineffectiveness can be attributed to differences between hedging instruments and hedged items:

- Mismatches in the terms of hedged items and hedging instruments, for example the frequency and timing of when interest rates are reset, frequency of payment and callable features.
- Difference in the discounting rate applied to the hedged item and the hedging instrument, taking into consideration differences in the reset frequency of the hedged item and hedging instrument.
- Derivatives used as hedging instrument with a non-zero fair value at inception date of the hedging relationship, resulting in mismatch in terms with the hedged item.

Foreign exchange risk

The Group manages its foreign currency risk (including U.S. dollar and British pound) from investments in foreign operation through net investment hedges using rolling foreign exchange forward strategy. In addition, the Group applies cash flow hedge accounting for specific foreign denominated highly probable cash flows using foreign exchange forward instruments as hedging instruments. .

As the investments in foreign operations are only hedged to the extent of the notional amount of the hedging derivative instrument the Group generally does not expect to incur significant ineffectiveness on hedges of net investments in foreign operations. Potential sources of ineffectiveness are limited to situations where derivatives with a non-zero fair value at inception date of the hedging relationship are used as hedging instrument, or where the spot foreign currency risk has been designated as hedged risk, resulting in mismatch in terms with the hedged item. Similarly, for cash flow hedge accounting applications the foreign exchange forward instruments generally match the terms of the underlying highly probable transactions such that the Group does not expect to incur significant ineffectiveness in such hedge relationships.

Hedge Accounting and Interest Rate Benchmarks

The table below shows the Group's hedge accounting relationships impacted by the IASB Benchmark Reform amendments, the significant interest rate benchmarks the Group is exposed to which are subject to expected future reform, and the nominal amounts of the derivative hedging instruments as at December 31, 2022 and December 31, 2021. As at December 31, 2022 there were no hedge relationships with hedging instruments, hedged items or the hedged risk being an IBOR benchmark which ceased to be quoted in early 2022. The derivative hedging instruments provide a close approximation to the extent of the risk exposure the Group manages through hedge accounting relationships.

Hedge accounting relationships impacted by the IASB Benchmark Reform amendments

in € m.	Dec 31, 2022	Dec 31, 2021
	Notional	Notional
Fair value hedge		
CHF LIBOR	0	0
GBP LIBOR	0	0
JPY LIBOR	0	0
USD LIBOR	12,281	20,298

In accordance with IAS 39.96 the gains and losses posted to equity in a cash flow hedge relationship is the lesser of cumulative gain or loss on the hedging instrument from the inception of the hedge and the cumulative change in fair value of the expected future cash flows on the hedged item from inception of the hedge. As a result, changes of the hedged item's value used for hedge effectiveness are not fully recorded in equity if it exceeds the hedging instrument's fair value changes used for hedge effectiveness. Consequently, hedge ineffectiveness recorded within P&L does not always reconcile to the difference between the changes of the hedged item's value used for hedge effectiveness and the hedging instrument's fair value changes used for hedge effectiveness.

As of December 31, 2022 the longest term cash flow hedge matures in 2034.

The financial instruments designated as cash flow hedges are recognized as Loans at amortized cost in the Group's Consolidated Balance Sheet.

Net investment hedge accounting

Derivatives held as net investment hedges

in € m.	Dec 31, 2022			2022	Dec 31, 2021			2021
	Assets	Liabilities	Nominal amount	Fair Value changes used for hedge effectiveness	Assets	Liabilities	Nominal amount	Fair Value changes used for hedge effectiveness
Derivatives held as net investment hedges	1,044	513	45,749	(2,539)	227	1,093	39,087	(1,707)

in € m.	2022		2021	
	Fair value changes recognised in Equity ¹	Hedge ineffectiveness	Fair value changes recognised in Equity ¹	Hedge ineffectiveness
Result of net investment hedges	2,410	(329)	1,892	(179)

¹ Reported in equity refers to accumulated other comprehensive income as presented in the Consolidated Balance Sheet.

Profile of derivatives held as net investment hedges

in € m.	Within 1 year	1–3 years	3–5 years	Over 5 years
As of December 31, 2022				
Nominal amount Foreign exchange forwards	34,664	229	21	0
Nominal amount Foreign exchange swaps	10,776	59	0	0
Total	45,440	288	21	0
As of December 31, 2021				
Nominal amount Foreign exchange forwards	31,727	36	0	3
Nominal amount Foreign exchange swaps	7,239	68	16	0
Total	38,965	103	16	3

The Group uses a foreign exchange forward strategy. As indicated in the above table, the vast majority of forward contracts mature within the year. The Group did not calculate an average foreign currency rate because the amount of contracts that mature after 1 year are not material.

36 – Related Party Transactions

Parties are considered to be related if one party has the ability to directly or indirectly control the other party or exercise significant influence over the other party in making financial or operational decisions. The Group's related parties include:

- Key management personnel including close family members and entities which are controlled, significantly influenced by, or for which significant voting power is held by key management personnel or their close family members
- Subsidiaries, joint ventures and associates and their respective subsidiaries
- Post-employment benefit plans for the benefit of Deutsche Bank employees

Transactions with Key Management Personnel

Key management personnel are those persons having authority and responsibility for planning, directing, and controlling the activities of Deutsche Bank, directly or indirectly. The Group considers the members of the Management Board and of the Supervisory Board of the parent company to constitute key management personnel for purposes of IAS 24.

Compensation expense of key management personnel

in € m.	2022	2021	2020
Short-term employee benefits	37	36	30
Post-employment benefits	5	7	7
Other long-term benefits	15	10	2
Termination benefits	2	6	0
Share-based payment	17	15	8
Total	76	74	47

The above table does not contain compensation that employee representatives and former board members on the Supervisory Board have received. The aggregated compensation paid to such members for their services as employees of Deutsche Bank or status as former employees (retirement, pension and deferred compensation) amounted to € 1 million as of December 31, 2022, € 1 million as of December 31, 2021 and € 1 million as of December 31, 2020.

Among the Group's transactions with key management personnel as of December 31, 2022, were loans and commitments of € 5 million and deposits of € 8 million. As of December 31, 2021, the Group's transactions with key management personnel were loans and commitments of € 8 million and deposits of € 13 million.

In addition, the Group provides banking services, such as payment and account services as well as investment advice, to key management personnel.

Transactions with Subsidiaries, Joint Ventures and Associates

Transactions between Deutsche Bank AG and its subsidiaries meet the definition of related party transactions. If these transactions are eliminated on consolidation, they are not disclosed as related party transactions. Transactions between the Group and its associated companies and joint ventures and their respective subsidiaries also qualify as related party transactions.

Transactions for subsidiaries, joint ventures and associates are presented combined in below table as these are not material individually.

Loans

in € m.	2022	2021
Loans outstanding, beginning of year	153	214
Net movement in loans during the period	(34)	159
Changes in the group of consolidated companies	0	0
Exchange rate changes/other ¹	0	(221)
Loans outstanding, end of year ^{1,2}	119	153
Other credit risk related transactions:		
Allowance for loan losses	0	0
Provision for loan losses	0	0
Guarantees and commitments	5	28

¹ Prior years' comparatives aligned to presentation in the current year.

² Loans past due were € 0 million as of December 31, 2022 and € 0 million as of December 31, 2021. For the total loans the Group held collateral of € 0 million and € 0 million as of December 31, 2022 and December 31, 2021, respectively.

Deposits

in € m.	2022	2021
Deposits outstanding, beginning of year	63	49
Net movement in deposits during the period	(32)	14
Changes in the group of consolidated companies	0	0
Exchange rate changes/other	0	0
Deposits outstanding, end of year	31	63

Other Transactions

Trading assets and positive market values from derivative financial transactions with associated companies amounted to € 3 million as of December 31, 2022, and € 2 million as of December 31, 2021. Trading liabilities and negative market values from derivative financial transactions with associated companies amounted to € 0 million as of December 31, 2022, and € 0 million as of December 31, 2021.

Other assets related to transactions with associated companies amounted to € 33 million as of December 31, 2022, and € 42 million as of December 31, 2021. Other liabilities related to transactions with associated companies were € 3 million as of December 31, 2022, and € 1 million as of December 31, 2021.

Transactions with Pension Plans

Under IFRS, post-employment benefit plans are considered related parties. The Group has business relationships with a number of its pension plans pursuant to which it provides financial services to these plans, including investment management services. The Group's pension funds may hold or trade Deutsche Bank shares or securities.

Transactions with related party pension plans

in € m.	2022	2021
Equity shares issued by the Group held in plan assets	0	23
Other assets	5	17
Fees paid from plan assets to asset managers of the Group	20	22
Market value of derivatives with a counterparty of the Group	1,389	765
Notional amount of derivatives with a counterparty of the Group	12,888	12,309

37 – Information on Subsidiaries

Composition of the Group

Deutsche Bank AG is the direct or indirect holding company for the Group's subsidiaries.

The Group consists of 521 (2021: 563) consolidated entities, thereof 200 (2021: 225) consolidated structured entities. 362 (2021: 376) of the entities controlled by the Group are directly or indirectly held by the Group at 100 % of the ownership interests (share of capital). Third parties also hold ownership interests in 159 (2021: 187) of the consolidated entities (non-controlling interests). As of December 31, 2022, and 2021, one subsidiary has material non-controlling interests. Non-controlling interests for all other subsidiaries are neither individually nor cumulatively material to the Group.

Subsidiaries with material non-controlling interests

	Dec 31, 2022	Dec 31, 2021
DWS Group GmbH & Co. KGaA		
Proportion of ownership interests and voting rights held by non-controlling interests	20.51 %	20.51 %
Place of business	Global	Global
in € m		
Net income attributable to non-controlling interests	119	161
Accumulated non-controlling interests of the subsidiary	1,622	1,545
Dividends paid to non-controlling interests	82	74
Summarized financial information:		
Total assets	11,396	11,611
Total liabilities	3,566	4,166
Total net revenues	2,712	2,720
Net income (loss)	599	782
Total comprehensive income (loss), net of tax	783	1,064

Significant restrictions to access or use the Group's assets

Statutory, contractual or regulatory requirements as well as protective rights of noncontrolling interests might restrict the ability of the Group to access and transfer assets freely to or from other entities within the Group and to settle liabilities of the Group.

The following restrictions impact the Group's ability to use assets:

- The Group has pledged assets to collateralize its obligations under repurchase agreements, securities financing transactions, collateralized loan obligations and for margining purposes for OTC derivative liabilities
- The assets of consolidated structured entities are held for the benefit of the parties that have bought the notes issued by these entities
- Regulatory and central bank requirements or local corporate laws may restrict the Group's ability to transfer assets to or from other entities within the Group in certain jurisdictions

Restricted assets

	Dec 31, 2022		Dec 31, 2021	
in € m.	Total assets	Restricted assets	Total assets	Restricted assets
Interest-earning deposits with banks	164,136	108	180,942	196
Financial assets at fair value through profit or loss	482,545	40,346	491,233	55,325
Financial assets at fair value through other comprehensive income	31,675	2,771	28,979	6,648
Loans at amortized cost	491,175	73,500	472,069	79,764
Other	174,686	3,592	151,482	3,233
Total	1,344,217	120,317	1,324,705	145,166

The table above excludes assets that are not encumbered at an individual entity level, but which may be subject to restrictions in terms of their transferability within the Group. Such restrictions may be based on local connected lending requirements or similar regulatory restrictions. In this situation, it is not feasible to identify individual balance sheet items that cannot be transferred. This is also the case for regulatory minimum liquidity requirements. The Group identifies the volume of liquidity reserves in excess of local stress liquidity outflows. The aggregate amount of such liquidity reserves that are considered restricted for this purpose is € 19.9 billion as of December 31, 2022 (as of December 31, 2021: € 25.5 billion).

38 – Structured entities

Nature, purpose and extent of the Group's interests in structured entities

The Group engages in various business activities with structured entities which are designed to achieve a specific business purpose. A structured entity is one that has been set up so that any voting rights or similar rights are not the dominant factor in deciding who controls the entity. An example is when voting rights relate only to administrative tasks and the relevant activities are directed by contractual arrangements.

A structured entity often has some or all of the following features or attributes:

- Restricted activities
- A narrow and well defined objective
- Insufficient equity to permit the structured entity to finance its activities without subordinated financial support
- Financing in the form of multiple contractually linked instruments to investors that create concentrations of credit or other risks (tranches)

The principal uses of structured entities are to provide clients with access to specific portfolios of assets and to provide market liquidity for clients through securitizing financial assets. Structured entities may be established as corporations, trusts or partnerships. Structured entities generally finance the purchase of assets by issuing debt and equity securities that are collateralized by and/or indexed to the assets held by the structured entities. The debt and equity securities issued by structured entities may include tranches with varying levels of subordination.

Structured entities are consolidated when the substance of the relationship between the Group and the structured entities indicate that the structured entities are controlled by the Group, as discussed in Note 1 "Significant Accounting Policies and Critical Accounting Estimates".

Consolidated structured entities

The Group has contractual arrangements which may require it to provide financial support to the following types of consolidated structured entities.

Securitization vehicles

The Group uses securitization vehicles for funding purchase of diversified pool of assets. The Group provides financial support to these entities in the form of liquidity facility. As of December 31, 2022, and December 31, 2021, there were no outstanding loan commitments to these entities.

Funds

The Group may provide funding and liquidity facility or guarantees to funds consolidated by the group. As of December 31, 2022 and December 31, 2021, the notional value of the liquidity facilities and guarantees provided by the Group to such funds was € 1.1 billion and € 1.2 billion, respectively.

Deutsche Bank did not provide non-contractual support during the year to consolidated structured entities.

Unconsolidated structured entities

These are entities which are not consolidated because the Group does not control them through voting rights, contract, funding agreements, or other means. The extent of the Group's interests to unconsolidated structured entities will vary depending on the type of structured entities.

Below is a description of the Group's involvements in unconsolidated structured entities by type.

Repackaging and investment entities

Repackaging and investment entities are established to meet clients' investment needs through the combination of securities and derivatives. These entities are not consolidated by the Group because the Group does not have power to influence the returns obtained from the entities. These entities are usually set up to provide a certain investment return pre-agreed with the investor, and the Group is not able to change the investment strategy or return during the life of the transaction.

Third party funding entities

The Group provides funding to structured entities that hold a variety of assets. These entities may take the form of funding entities, trusts and private investment companies. The funding is collateralized by the asset in the structured entities. The group's involvement involves predominantly both lending and loan commitments.

The vehicles used in these transactions are controlled by the borrowers where the borrowers have the ability to decide whether to post additional margin or collateral in respect of the financing. In such cases, where borrowers can decide to continue or terminate the financing, the borrowers will consolidate the vehicle.

Securitization Vehicles

The Group establishes securitization vehicles which purchase diversified pools of assets, including fixed income securities, corporate loans, and asset-backed securities (predominantly commercial and residential mortgage-backed securities and credit card receivables). The vehicles fund these purchases by issuing multiple tranches of debt and equity securities, the repayment of which is linked to the performance of the assets in the vehicles.

The Group may transfer assets to these securitization vehicles and provides financial support to these entities in the form of liquidity facilities.

The Group also invests and provides liquidity facilities to third party sponsored securitization vehicles.

The securitization vehicles that are not consolidated into the Group are those where the Group does not hold the power or ability to unilaterally remove the servicer or special servicer who has been delegated power over the activities of the entity.

Funds

The Group establishes structured entities to accommodate client requirements to hold investments in specific assets. The Group also invests in funds that are sponsored by third parties. A group entity may act as fund manager, custodian or some other capacity and provide funding and liquidity facilities to both group sponsored and third party funds. The funding provided is collateralized by the underlying assets held by the fund.

The Group does not consolidate funds when Deutsche Bank is deemed agent or when another third party investor has the ability to direct the activities of the fund.

Other

These are Deutsche Bank sponsored or third party structured entities that do not fall into any criteria above. These entities are not consolidated by the Group when the Group does not hold power over the decision making of these entities.

Income derived from involvement with structured entities

The Group earns management fees and, occasionally, performance-based fees for its investment management service in relation to funds. Interest income is recognized on the funding provided to structured entities. Any trading revenue as a result of derivatives with structured entities and from the movements in the value of notes held in these entities is recognized in 'Net gains/losses on financial assets/liabilities held at fair value through profit and loss'.

Interests in unconsolidated structured entities

The Group's interests in unconsolidated structured entities refer to contractual and non-contractual involvement that exposes the Group to variability of returns from the performance of the structured entities. Examples of interests in unconsolidated structured entities include debt or equity investments, liquidity facilities, guarantees and certain derivative instruments in which the Group is absorbing variability of returns from the structured entities.

Interests in unconsolidated structured entities exclude instruments which introduce variability of returns into the structured entities. For example, when the Group purchases credit protection from an unconsolidated structured entity whose purpose and design is to pass through credit risk to investors, the Group is providing the variability of returns to the entity rather than absorbing variability. The purchased credit protection is therefore not considered as an interest for the purpose of the table below.

Maximum exposure to unconsolidated structured entities

The maximum exposure to loss is determined by considering the nature of the interest in the unconsolidated structured entity. The maximum exposure for loans and trading instruments is reflected by their carrying amounts in the consolidated balance sheet. The maximum exposure for derivatives and off balance sheet commitments such as guarantees, liquidity facilities and loan commitments under IFRS 12, as interpreted by the Group, is reflected by the notional amounts. Such amounts or its development do not reflect the economic risks faced by the Group because it does not take into account the effects of collateral or hedges nor the probability of such losses being incurred. At December 31, 2022, the notional related to the positive and negative replacement values of derivatives and off balance sheet commitments were € 457 billion, € 397 billion and € 28 billion respectively. At December 31, 2021, the notional related to the positive and negative replacement values of derivatives and off balance sheet commitments were € 104 billion, € 296 billion and € 22 billion respectively.

Size of structured entities

The Group provides a different measure for size of structured entities depending on their type. The following measures have been considered as appropriate indicators for evaluating the size of structured entities:

- Funds – Net asset value or assets under management where the Group holds fund units and notional of derivatives when the Group's interest comprises of derivatives
- Securitizations – notional of notes in issue (excluding interest only and excess notes where applicable) when the Group derives its interests through notes its holds and notional of derivatives when the Group's interests is in the form of derivatives
- Third party funding entities – Total assets in entities
- Repackaging and investment entities – Fair value of notes in issue

For Third party funding entities, size information is not publicly available, therefore the Group has disclosed the greater of the collateral the Group has received/pledged or the notional of the exposure the Group has to the entity.

Based on the above definitions, the total size of structured entities is € 2,723 billion, of which the majority of € 1,138 billion is from Funds. In 2021, it was € 2,168 billion and € 1,251 billion respectively.

The following table shows, by type of structured entity, the carrying amounts of the Group's interests recognized in the consolidated statement of financial position as well as the maximum exposure to loss resulting from these interests. The carrying amounts presented below do not reflect the true variability of returns faced by the Group because they do not take into account the effects of collateral or hedges.

Carrying amounts and size relating to Deutsche Bank's interests

Dec 31, 2022

in € m.	Repackaging and Investment Entities	Third Party Funding Entities	Securitizations	Funds	Total
Assets					
Cash and central bank balances	0	0	0	0	0
Interbank balances (w/o central banks)	1	0	319	7	327
Central bank funds sold and securities purchased under resale agreements	0	0	87	2,404	2,491
Securities Borrowed	0	0	0	0	0
Total financial assets at fair value through profit or loss	195	8,675	4,956	46,695	60,520
Trading assets	145	2,910	3,159	3,660	9,874
Positive market values (derivative financial instruments)	34	4,224	863	5,458	10,580
Non-trading financial assets mandatory at fair value through profit or loss	16	1,541	933	37,577	40,067
Financial assets designated at fair value through profit or loss	0	0	0	0	0
Financial assets at fair value through other comprehensive income	0	830	298	404	1,532
Loans at amortized cost	212	68,398	31,077	18,896	118,583
Other assets	0	956	3,293	10,405	14,654
Total assets	408	78,859	40,030	78,810	198,107
Liabilities					
Total financial liabilities at fair value through profit or loss	51	1,251	438	5,021	6,761
Negative market values (derivative financial instruments)	51	1,251	438	5,021	6,761
Other short-term borrowings	0	0	0	0	0
Other liabilities	0	0	0	0	0
Total liabilities	51	1,251	438	5,021	6,761
Off-balance sheet exposure	0	10,644	11,045	6,747	28,437
Total	357	88,252	50,637	80,536	219,782

Dec 31, 2021

in € m.	Repackaging and Investment Entities	Third Party Funding Entities	Securitizations	Funds	Total
Assets					
Cash and central bank balances	0	0	0	0	0
Interbank balances (w/o central banks)	1	0	0	11	12
Central bank funds sold and securities purchased under resale agreements	0	0	82	1,593	1,675
Securities Borrowed	0	0	0	0	0
Total financial assets at fair value through profit or loss	328	7,860	4,923	44,192	57,303
Trading assets	172	4,825	3,243	3,980	12,220
Positive market values (derivative financial instruments)	156	300	9	2,671	3,135
Non-trading financial assets mandatory at fair value through profit or loss	0	2,735	1,671	37,542	41,948
Financial assets designated at fair value through profit or loss	0	0	0	0	0
Financial assets at fair value through other comprehensive income	0	298	1,043	530	1,871
Loans at amortized cost	1,089	60,338	26,406	15,245	103,079
Other assets	4	575	3,333	12,202	16,114
Total assets	1,422	69,072	35,787	73,773	180,054
Liabilities					
Total financial liabilities at fair value through profit or loss	74	185	20	8,721	9,000
Negative market values (derivative financial instruments)	74	185	20	8,721	9,000
Other short-term borrowings	0	0	0	0	0
Other liabilities	0	0	0	13	13
Total liabilities	74	185	20	8,734	9,013
Off-balance sheet exposure	0	7,765	10,093	3,683	21,541
Total	1,348	76,652	45,861	68,722	192,582

Trading assets – Total trading assets as of December 31, 2022 and December 31, 2021 of € 9.9 billion and € 12.2 billion are comprised primarily of € 3.2 billion and € 3.2 billion in Securitizations and € 3.7 billion and € 4.0 billion in Funds structured entities respectively. The Group's interests in securitizations are collateralized by the assets contained in these entities. Where the Group holds fund units these are typically in regards to market making in funds or otherwise serve as hedges for notes issued to clients. Moreover the credit risk arising from loans made to Third party funding structured entities is mitigated by the collateral received.

Non-trading financial assets mandatory at fair value through profit or loss – Reverse repurchase agreements to Funds comprise the majority of the interests in this category and are collateralized by the underlying securities.

Loans – Loans as of December 31, 2022 and December 31, 2021 consist of € 118.6 billion and € 103.1 billion investment in securitization tranches and financing to Third party funding entities. The Group's financing to Third party funding entities is collateralized by the assets in those structured entities.

Other assets – Other assets as of December 31, 2022 and December 31, 2021 of € 14.7 billion and € 16.1 billion, respectively, consist primarily of cash margin balances.

Pending Receivables – Pending Receivable balances are not included in this disclosure note due to the fact that these balances arise from typical customer supplier relationships out of e.g. brokerage type activities and their inherent volatility would not provide users of the financial statements with effective information about Deutsche Bank's exposures to structured entities.

Financial support

Deutsche Bank did not provide non-contractual support during the year to unconsolidated structured entities.

Sponsored unconsolidated structured entities where the Group has no interest as of December 31, 2022 and December 31, 2021.

As a sponsor, the Group is involved in the legal set up and marketing of the entity and supports the entity in different ways, namely:

- Transferring assets to the entities
- Providing seed capital to the entities
- Providing operational support to ensure the entity's continued operation
- Providing guarantees of performance to the structured entities.

The Group is also deemed a sponsor for a structured entity if market participants would reasonably associate the entity with the Group. Additionally, the use of the Deutsche Bank name for the structured entity indicates that the Group has acted as a sponsor.

The gross revenues from sponsored entities where the Group did not hold an interest as of December 31, 2022 and December 31, 2021 were € 226 million and € 254 million respectively. Instances where the Group does not hold an interest in an unconsolidated sponsored structured entity include cases where any seed capital or funding to the structured entity has already been repaid in full to the Group during the year. This amount does not take into account the impacts of hedges and is recognized in Net gains/losses on financial assets/liabilities at fair value through profit and loss. The aggregated carrying amounts of assets transferred to sponsored unconsolidated structured entities in 2022 were € 3.4 billion for securitization and € 1.2 billion for repackaging and investment entities. In 2021, they were € 3.2 billion for securitization and € 1.4 billion for repackaging and investment entities.

39 – Current and non-current assets and liabilities

Asset and liability line items by amounts recovered or settled within or after one year

Asset items as of December 31, 2022

in € m.	Amounts recovered or settled		Total
	within one year	after one year	Dec 31, 2022
Cash and central bank balances	178,896	0	178,896
Interbank balances (w/o central banks)	7,189	6	7,195
Central bank funds sold and securities purchased under resale agreements	8,415	3,063	11,478
Securities borrowed	0	0	0
Financial assets at fair value through profit or loss	476,114	6,431	482,545
Financial assets at fair value through other comprehensive income	7,296	24,380	31,675
Equity method investments	0	1,124	1,124
Loans at amortized cost	126,584	364,591	491,175
Property and equipment	0	6,103	6,103
Goodwill and other intangible assets	0	7,092	7,092
Other assets	93,564	24,560	118,124
Assets for current tax	873	711	1,584
Total assets before deferred tax assets	898,931	438,061	1,336,992
Deferred tax assets			7,225
Total assets			1,344,217

Liability items as of December 31, 2022

in € m.	Amounts recovered or settled		Total
	within one year	after one year	Dec 31, 2022
Deposits	604,227	24,956	629,183
Central bank funds purchased and securities sold under repurchase agreements	517	56	573
Securities loaned	13	0	13
Financial liabilities at fair value through profit or loss	384,020	4,118	388,138
Other short-term borrowings	5,122	0	5,122
Other liabilities	107,343	6,305	113,648
Provisions	2,449	0	2,449
Liabilities for current tax	240	148	388
Long-term debt	46,622	84,903	131,525
Trust preferred securities	500	0	500
Total liabilities before deferred tax liabilities	1,151,052	120,486	1,271,538
Deferred tax liabilities			538
Total liabilities			1,272,076

Asset items as of December 31, 2021

in € m.	Amounts recovered or settled		Total
	within one year	after one year	Dec 31, 2021
Cash and central bank balances	192,012	9	192,021
Interbank balances (w/o central banks)	7,318	24	7,342
Central bank funds sold and securities purchased under resale agreements	5,904	2,465	8,368
Securities borrowed	63	0	63
Financial assets at fair value through profit or loss	483,183	8,050	491,233
Financial assets at fair value through other comprehensive income	6,995	21,984	28,979
Equity method investments	0	1,091	1,091
Loans at amortized cost	133,266	338,803	472,069
Property and equipment	0	5,536	5,536
Goodwill and other intangible assets	0	6,824	6,824
Other assets	87,654	16,130	103,784
Assets for current tax	717	497	1,214
Total assets before deferred tax assets	917,111	401,414	1,318,525
Deferred tax assets			6,180
Total assets			1,324,705

Liability items as of December 31, 2021

in € m.	Amounts recovered or settled		Total
	within one year	after one year	Dec 31, 2021
Deposits	582,924	21,472	604,396
Central bank funds purchased and securities sold under repurchase agreements	297	450	747
Securities loaned	24	0	24
Financial liabilities at fair value through profit or loss	398,204	2,653	400,857
Other short-term borrowings	4,034	0	4,034
Other liabilities ¹	92,314	5,482	97,795
Provisions	2,641	0	2,641
Liabilities for current tax	411	189	600
Long-term debt	49,434	95,051	144,485
Trust preferred securities	528	0	528
Total liabilities before deferred tax liabilities¹	1,130,811	125,297	1,256,108
Deferred tax liabilities			498
Total liabilities			1,256,606

¹ Prior year's comparatives aligned to presentation in the current year.

40 – Events after the reporting period

Having fulfilled its de-risking and cost reduction mandate from 2019 through end-2022, the Capital Release Unit will cease to be reported as a separate segment with effect from the first quarter of 2023. Its remaining portfolio, resources and employees will be reported within the Corporate & Other segment. In line with that change, the Core Bank, which represents the Group excluding the Capital Release Unit, will cease to be reported as well, and from the first quarter of 2023 the Group will consist of the segments Corporate Bank, Investment Bank, Private Bank, Asset Management and Corporate & Other.

The Group will implement additional Driver-Based Cost Management allocations from the first quarter of 2023. The new methodology aims to provide greater transparency over the drivers of infrastructure costs and links costs more closely to service consumption. While the Group's cost/income ratio and return on tangible equity metrics will be unaffected by the change in internal allocations, the respective divisional metrics will change going forward.

41 – Regulatory capital information

General definitions

The calculation of Deutsche Bank's own funds incorporates the capital requirements following the "Regulation (EU) No 575/2013 on prudential requirements for credit institutions" CRR and the "Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions" CRD, which have been further amended with subsequent Regulations and Directives. The CRD has been implemented into German law. The information in this section as well as in the section "Development of risk-weighted assets" is based on the regulatory principles of consolidation.

This section refers to the capital adequacy of the group of entities consolidated for banking regulatory purposes pursuant to the CRR and the German Banking Act ("Kreditwesengesetz" or "KWG"). Therein not included are insurance companies or companies outside the finance sector.

The total own funds pursuant to the effective regulations as of year end 2022 comprises Tier 1 and Tier 2 capital. Tier 1 capital is subdivided into Common Equity Tier 1 capital and Additional Tier 1 capital.

CET 1 capital consists primarily of common share capital (reduced by own holdings) including related share premium accounts, retained earnings (including losses for the financial year, if any) and accumulated other comprehensive income, subject to regulatory adjustments (i.e., prudential filters and deductions), as well as minority interests qualifying for inclusion in consolidated CET 1 capital. Prudential filters for CET 1 capital, according to Articles 32 to 35 CRR, include (i) securitization gains on sale, (ii) cash flow hedges and changes in the value of own liabilities, and (iii) additional value adjustments. CET 1 capital deductions for instance includes (i) intangible assets (exceeding their prudential value), (ii) deferred tax assets that rely on future profitability, (iii) negative amounts resulting from the calculation of expected loss amounts, (iv) net defined benefit pension fund assets, (v) reciprocal cross holdings in the capital of financial sector entities and, (vi) significant and non-significant investments in the capital (CET 1, AT1, Tier 2) of financial sector entities above certain thresholds. All items not deducted (i.e., amounts below the threshold) are subject to risk-weighting.

Additional Tier 1 capital consists of AT1 capital instruments and related share premium accounts as well as noncontrolling interests qualifying for inclusion in consolidated AT1 capital. To qualify as AT1 capital under CRR/CRD, instruments must have principal loss absorption through a conversion to common shares or a write-down mechanism allocating losses at a trigger point and must also meet further requirements (perpetual with no incentive to redeem; institution must have full dividend/coupon discretion at all times, etc.).

Tier 2 capital comprises eligible capital instruments, the related share premium accounts and subordinated long-term debt, certain loan loss provisions and noncontrolling interests that qualify for inclusion in consolidated Tier 2 capital. To qualify as Tier 2 capital, capital instruments or subordinated debt must have an original maturity of at least five years. Moreover, eligible capital instruments may inter alia not contain an incentive to redeem, a right of investors to accelerate repayment, or a credit sensitive dividend feature.

In the comparison period of this report Deutsche Bank presents certain figures based on the CRR definition of own fund instruments applicable for Additional Tier 1 and Tier 2 instruments.

Starting with the first quarter of 2022, CET 1, Tier 1 Capital and Total Capital is presented as reported. The fully loaded definition has been discontinued in the first quarter 2022 due to immaterial differences.

Capital instruments

The Management Board received approval from the 2021 Annual General Meeting to buy back up to 206.7 million shares before the end of April 2026. Thereof 103.3 million shares can be purchased by using derivatives, this includes 41.3 million derivatives with a maturity exceeding 18 months. During the period from the 2021 Annual General Meeting until the 2022 Annual General Meeting (May 19, 2022), 59.8 million shares were purchased. A total amount of 33.3 million shares was purchased for equity compensation purposes in the same period or upcoming periods. The remaining amount of 26.5 million shares was bought back for cancellation with the purpose of distributing capital to shareholders. In addition, 48.8 million call options were purchased for equity compensation purposes in upcoming periods. The number of shares held in Treasury from buybacks amounted to 34.8 million as of the 2022 Annual General Meeting, thereof 26.5 million shares for cancellation and 8.3 million shares for equity compensation purposes.

The 2022 Annual General Meeting granted the Management Board the approval to buy back up to 206.7 million shares before the end of April 2027. Thereof 103.3 million shares can be purchased by using derivatives, this includes 41.3 million derivatives with a maturity exceeding 18 months. These authorizations substitute the authorizations of the previous year. During the period from the 2022 Annual General Meeting until December 31, 2022, no shares or call options were purchased. The number of shares held in Treasury from buybacks amounted to 28.9 million as of December 31, 2022. Thereof 26.5 million relate to shares bought back for cancellation. The remaining amount of 2.4 million relates to shares to be used for equity compensation purposes in upcoming periods.

Since the 2017 Annual General Meeting, renewed at the 2021 Annual General Meeting, and as of December 31, 2022, authorized capital available to the Management Board is € 2,560 million (1,000 million shares). On 30 April 2022, the conditional capital against cash of € 512 million (200 million shares) and for equity compensation of € 51.2 million (20 million shares) expired unused.

Further, the 2022 Annual General Meeting authorized the issuance of participatory notes and other hybrid debt securities that fulfill the regulatory requirements to qualify as Additional Tier 1 capital with an equivalent value of € 9.0 billion on or before April 30, 2027.

Transitional agreements for AT1 and Tier 2 instruments were applicable until January 1, 2022. Capital instruments issued on or prior to December 31, 2011, that no longer qualify as AT1 or Tier 2 capital under the fully loaded CRR/CRD as currently applicable were subject to grandfathering rules during the transitional period and were phased out from 2013 to 2022 with their recognition capped at 20% in 2020 and 10% in 2021 (in relation to the portfolio eligible for grandfathering which was outstanding on December 31, 2012). The grandfathering no longer applies as of January 1, 2022.

The current CRR as applicable since June 27, 2019, provides further grandfathering rules for AT1 and Tier 2 instruments issued prior to June 27, 2019. AT1 and Tier 2 instruments issued through special purpose entities were grandfathered until December 31, 2021. In 2022, transitional arrangements only exist for AT1 and Tier 2 instruments which continue to qualify until June 26, 2025, even if they do not meet certain new requirements that apply since June 27, 2019. Deutsche Bank had an immaterial amount of instruments that qualified during 2022, which resulted in there being no material difference between the “fully loaded” and “transitional” amounts.

Based on the current CRR, the Group has eligible AT1 instruments of € 8.6 billion outstanding as of December 2022. In 2022, the bank issued AT1 notes amounting to € 2.0 billion and redeemed AT1 instruments with a notional of € 1.75 billion.

As of December 31, 2022, Tier 2 capital instruments amounted to € 9.5 billion (nominal value of € 11.7 billion). In 2022, the bank issued Tier 2 capital instruments with a nominal value of € 1.5 billion and U.S. \$ 1.25 billion (equivalent amount of € 1.2 billion) and a notional of € 15 million Tier 2 capital instruments matured.

Minimum capital requirements and additional capital buffers

Failure to meet minimum capital requirements can result in supervisory measures such as restrictions of profit distributions or limitations on certain businesses such as lending. Deutsche Bank complied with the minimum regulatory capital adequacy requirements in 2022.

Details on regulatory capital

Own Funds Template (incl. RWA and capital ratios)

	Dec 31, 2022 ³	Dec 31, 2021
in € m.	CRR/CRD	CRR/CRD
Common Equity Tier 1 (CET 1) capital: instruments and reserves		
Capital instruments, related share premium accounts and other reserves	45,458	45,864
Retained earnings	12,305	10,506
Accumulated other comprehensive income (loss), net of tax	(1,314)	(444)
Independently reviewed interim profits net of any foreseeable charge or dividend ¹	4,183	1,379
Other	1,002	910
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	61,634	58,215
Common Equity Tier 1 (CET 1) capital: regulatory adjustments		
Additional value adjustments (negative amount)	(2,026)	(1,812)
Other prudential filters (other than additional value adjustments)	600	(14)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(5,024)	(4,897)
Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (negative amount)	(3,244)	(1,466)
Negative amounts resulting from the calculation of expected loss amounts	(466)	(573)
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	(1,149)	(991)
Direct, indirect and synthetic holdings by an institution of own CET 1 instruments (negative amount)	(0)	0
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above the 10 % / 15 % thresholds and net of eligible short positions) (negative amount)	0	0
Deferred tax assets arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (amount above the 10 % / 15 % thresholds) (negative amount)	0	(151)
Other regulatory adjustments ²	(2,225)	(1,805)
Total regulatory adjustments to Common Equity Tier 1 (CET 1) capital	(13,536)	(11,709)
Common Equity Tier 1 (CET 1) capital	48,097	46,506
Additional Tier 1 (AT1) capital: instruments		
Capital instruments and the related share premium accounts	8,578	8,328
Amount of qualifying items referred to in Art. 484 (4) CRR and the related share premium accounts subject to phase out from AT1	0	600
Additional Tier 1 (AT1) capital before regulatory adjustments	8,578	8,928
Additional Tier 1 (AT1) capital: regulatory adjustments		
Direct, indirect and synthetic holdings by an institution of own AT1 instruments (negative amount)	(60)	(60)
Residual amounts deducted from AT1 capital with regard to deduction from CET 1 capital during the transitional period pursuant to Art. 472 CRR	0	0
Other regulatory adjustments	0	0
Total regulatory adjustments to Additional Tier 1 (AT1) capital	(60)	(60)
Additional Tier 1 (AT1) capital	8,518	8,868
Tier 1 capital (T1 = CET 1 + AT1)	56,616	55,375
Tier 2 (T2) capital	9,531	7,358
Total capital (TC = T1 + T2)	66,146	62,732
Total risk-weighted assets	360,003	351,629
Capital ratios		
Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets)	13.4	13.2
Tier 1 capital ratio (as a percentage of risk-weighted assets)	15.7	15.7
Total capital ratio (as a percentage of risk-weighted assets)	18.4	17.8

N/M – Not meaningful

¹ Full year profit is recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4)

² Includes capital deductions of € 1.2 billion (Dec 2021: € 1.1 billion) based on ECB guidance on irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme, € 1.0 billion (Dec 2021: € 0.7 billion) based on ECB's supervisory recommendation for a prudential provisioning of non-performing exposures, € 7.4 million (Dec 2021: € 17 million) resulting from minimum value commitments as per Article 36 (1)(n) of the CRR and CET 1 decrease of € 14.7 million (Dec 2021: € 39 million) from IFRS 9 transitional provision as per Article 473a of the CRR

³ Starting with the first quarter of 2022, information is presented as reported as the fully loaded definition has been eliminated as resulting only in an immaterial difference; comparative information for earlier periods is unchanged and based on Deutsche Bank's earlier fully loaded definition

⁴ Numbers may not add up due to rounding

Reconciliation of shareholders' equity to Own Funds

in € m.	CRR/CRD	
	Dec 31, 2022	Dec 31, 2021
Total shareholders' equity per accounting balance sheet (IASB IFRS)	61,772	58,096
Difference between equity per IASB IFRS / EU IFRS ³	187	(68)
Total shareholders' equity per accounting balance sheet (EU IFRS)	61,959	58,027
Deconsolidation/Consolidation of entities	29	265
Of which:		
Additional paid-in capital	0	0
Retained earnings	29	265
Accumulated other comprehensive income (loss), net of tax	0	0
Total shareholders' equity per regulatory balance sheet	61,988	58,292
Minority Interests (amount allowed in consolidated CET 1)	1,002	910
AT1 coupon and shareholder dividend deduction ¹	(1,342)	(987)
Capital instruments not eligible under CET 1 as per CRR 28(1) (22) 0	(14)	0
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	61,634	58,215
Additional value adjustments	(2,026)	(1,812)
Other prudential filters (other than additional value adjustments)	600	(14)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(5,024)	(4,897)
Deferred tax assets that rely on future profitability	(3,244)	(1,617)
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	(1,149)	(991)
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities	0	0
Other regulatory adjustments ²	(2,691)	(2,378)
Common Equity Tier 1 capital⁴	48,097	46,506

¹ Full year profit is recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4)

² Includes capital deductions of € 1.2 billion (Dec 2021: € 1.1 billion) based on ECB guidance on irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme, € 1.0 billion (Dec 2021: € 0.7 billion) based on ECB's supervisory recommendation for a prudential provisioning of non-performing exposures, € 7.4 million (Dec 2021: € 17 million) resulting from minimum value commitments as per Article 36 (1)(n) of the CRR and CET 1 decrease of € 14.7 million (Dec 2021: € 39 million) from IFRS 9 transitional provision as per Article 473a of the CRR

³ Differences in "equity per balance sheet" result entirely from deviations in profit (loss) after taxes due to the application of EU carve-out rules as set forth in the chapter "Basis of preparation/impact of changes in accounting principles". These rules were initially applied in the first quarter 2020.

⁴ Numbers may not add up due to rounding

Capital management

Deutsche Bank's Treasury function manages solvency, capital adequacy, leverage, and bail-in capacity ratios at Group level and locally in each region, as applicable. Treasury implements Deutsche Bank's capital strategy, which itself is developed by the Group Risk Committee and approved by the Management Board. Treasury, directly or through the Group Asset and Liability Committee, manages, among other things, issuance and repurchase of shares and capital instruments, hedging of capital ratios against foreign exchange swings, setting capacities for key financial resources, the design of shareholders' equity allocation, and regional capital planning. The bank is fully committed to maintaining Deutsche Bank's sound capitalization both from an economic and regulatory perspective considering both book equity based on IFRS accounting standards, regulatory and economic capital as well as specific capital requirements from rating agencies. The bank continuously monitors and adjusts Deutsche Bank's overall capital demand and supply to always achieve an appropriate balance.

Treasury manages the issuance and repurchase of capital instruments, namely Common Equity Tier 1, Additional Tier 1 and Tier 2 capital instruments as well as TLAC/MREL eligible debt instruments. Treasury constantly monitors the market for liability management trades. Such trades represent a countercyclical opportunity to create Common Equity Tier 1 capital by buying back Deutsche Bank's issuances below par.

Treasury manages the sensitivity of Deutsche Bank's CET 1 ratio and capital towards swings in foreign currency exchange rates against the euro. For this purpose, Treasury develops and executes suitable hedging strategies within the constraints of a Management Board approved Risk Appetite. Capital invested into Deutsche Bank's foreign subsidiaries and branches is either not hedged, partially hedged or fully hedged. Thereby, Treasury aims to balance effects from foreign exchange rate movements on capital, capital deduction items and risk weighted assets in foreign currency. In addition, Treasury also accounts for associated hedge cost and implications on market risk weighted assets.

Resource limit setting

Usage of key financial resources is influenced through the following governance processes and incentives.

Target resource capacities are reviewed in Deutsche Bank's annual strategic plan in line with Deutsche Bank's CET 1 and Leverage Ratio ambitions. As a part of Deutsche Bank's quarterly process, the Group Asset and Liability Committee approves divisional resource limits for total capital demand (defined as the sum of RWA and certain RWA equivalents of Capital Deduction Items) and leverage exposure that are based on the strategic plan but adjusted for market conditions and the short-term outlook. Limits are enforced through a close monitoring process and an excess charging mechanism.

Overall regulatory capital requirements are principally driven by either Deutsche Bank's CET 1 ratio (solvency) or leverage ratio (leverage) requirements, whichever is the more binding constraint. For the internal capital allocation, the combined contribution of each segment to the Group's Common Equity Tier 1 ratio, the Group's Leverage ratio and the Group's Capital Loss under Stress are weighted to reflect their relative importance and level of constraint to the Group. Contributions to the Common Equity Tier 1 ratio and the Leverage ratio are measured through RWA and Leverage Ratio Exposure (LRE). The Group's Capital Loss under Stress is a measure of the Group's overall economic risk exposure under a defined stress scenario. Goodwill, other intangible assets, and business-related regulatory capital deduction items included in total capital demand are directly allocated to the respective segments, supporting the calculation of the allocated tangible shareholders equity and the respective rate of return.

Most of Deutsche Bank's subsidiaries and several of Deutsche Bank's branches are subject to legal and regulatory capital requirements. In developing, implementing, and testing Deutsche Bank's capital and liquidity position, the bank fully takes such legal and regulatory requirements into account. Any material capital requests of Deutsche Bank's branches and subsidiaries across the globe are presented to and approved by the Group Investment Committee prior to execution.

Further, Treasury is a member of Deutsche Bank's Pensions Committee and represented in relevant Investment Committees overseeing the management of the assets of the largest Deutsche Bank pension funds in Germany. These investment committees set the investment strategy for these funds in line with the bank's investment objective to protect the capital base and distribution capacity of the bank.

42 – Impact of Deutsche Bank's transformation

As of December 31, 2022, the Group has fully recognized all transformation-related effects associated with its transformation announced in July 2019. For the full year 2022 transformation related effects amounted to € 126 million, after € 1.5 billion in 2021. Since the start of the transformation phase in 2019, the Group has recognized a total of € 8.5 billion transformation related effects.

As part of the transformation related effects, the Group has recognized transformation charges. For the full year 2022 transformation charges amounted to € 132 million, after € 1.0 billion in 2021. Since the start of the transformation phase in 2019, the Group has recognized a total of € 2.8 billion transformation charges.

43 – Interest rate benchmark reform

The following table shows the notional values of financial instruments, external to the Group, which reference IBORs where it is expected that there will no longer be a requirement to quote IBOR rates. The table includes those financial instruments with a maturity date that extends past the date when the requirement to submit quotes is expected to end. All the positions previously referencing GBP LIBOR, CHF LIBOR, JPY LIBOR, EUR LIBOR, EONIA and those USD LIBOR tenors that ceased in early 2022 have either been transitioned to an alternative reference rate or utilize GBP and JPY synthetic IBOR until the transition arrangements are finalized. Contracts utilizing GBP and JPY synthetic LIBOR as of December 31, 2022 had an immaterial impact to the notional values of the group (December 31, 2021: approximately € 1.15 billion). As a result, the amounts disclosed as of December 31, 2022 only includes USD LIBOR financial instruments, where the maturity date of the financial instruments is after June 30, 2023.

Interest Rate Benchmark (IBOR) Reform

in € m.	Dec 31, 2022	
	USD LIBOR	
Non-Derivative Financial assets	33,862	
Loans	31,416	
Other	2,445	
Derivative Financial assets	3,062,368	
Total financial assets	3,096,230	
Non-Derivative Financial liabilities	8,666	
Bonds	7,731	
Deposits	728	
Other	207	
Derivative Financial liabilities	2,835,216	
Total financial liabilities	2,843,883	
Off-balance sheet	34,914	

in € m.	Dec 31, 2021						
	USD LIBOR	GBP LIBOR	CHF LIBOR	JPY LIBOR	EONIA	Other IBORs	Multiple basis ²
Non-Derivative							
Financial assets	64,584	5,605	182	66	536	469	-
Loans	62,403	5,478	182	59	363	469	-
Other	2,181	127	-	7	173	-	-
Derivative Financial assets¹	2,829,421	351,302	47,065	523,527	9,042	40,503	167,050
Total financial assets	2,894,005	356,907	47,247	523,593	9,578	40,971	167,050
Non-Derivative							
Financial liabilities	17,403	41	-	-	689	-	-
Bonds	6,561	-	-	-	-	-	-
Deposits	10,809	-	-	-	664	-	-
Other	32	41	-	-	25	-	-
Derivative Financial liabilities¹	2,669,363	321,430	45,442	502,571	7,151	38,650	144,217
Total financial liabilities	2,686,766	321,471	45,442	502,571	7,840	38,650	144,217
Off-balance sheet	73,166	498	40	95	1,963	33	-

¹ The Group also has exposure to interest rate benchmark reform in respect of its cash collateral balances across some of its Credit Support Annex agreements. This exposure is not presented in the table due to its short term nature.

² Multiple basis relates to underlying contracts utilizing multiple benchmarks subject to reforms, (e.g. floating- floating interest rate swaps which have cash flows in GBP IBOR and USD IBOR).

44 – Condensed Deutsche Bank AG (parent company only) financial information

In May 2020 the former subsidiary DB Privat- und Firmenkundenbank AG was merged with Deutsche Bank AG effective retrospectively as of January 1, 2020.

Condensed statement of income

in € m.	2022	2021	2020
Interest income, excluding dividends from subsidiaries	20,682	13,830	15,301
Dividends received from subsidiaries:			
Bank subsidiaries	395	356	166
Nonbank subsidiaries	1,117	893	859
Interest expense	9,909	5,120	6,274
Net interest and dividend income	12,284	9,959	10,052
Provision for credit losses	829	317	1,444
Net interest and dividend income after provision for credit losses	11,455	9,642	8,608
Noninterest income:			
Commissions and fee income	4,383	4,987	4,414
Net gains (losses) on financial assets/liabilities at fair value through profit or loss	1,824	2,151	1,709
Other income (loss) ¹	3,541	(105)	1,506
Total noninterest income	9,747	7,034	7,629
Noninterest expenses:			
Compensation and benefits	5,679	5,395	5,641
General and administrative expenses	6,273	7,427	6,950
Services provided by (to) affiliates, net	2,165	2,097	2,730
Impairment of goodwill and other intangible assets	0	0	0
Total noninterest expenses	14,118	14,918	15,321
Income (loss) before income taxes	7,084	1,757	916
Income tax expense (benefit)	(1,189)	213	(34)
Net income (loss) attributable to Deutsche Bank shareholders and additional equity components	8,273	1,544	950

¹ Includes net gains (losses) on financial assets mandatory at fair value through other comprehensive income as well as impairments and write-ups on investments in subsidiaries. In 2020 the gain from the merger of DB Privat- und Firmenkundenbank with Deutsche Bank AG is also included.

Condensed statement of comprehensive income

in € m.	2022	2021	2020
Net income (loss) attributable to Deutsche Bank shareholders and additional equity components	8,273	1,544	950
Other comprehensive income (loss), net of tax	(1,006)	130	(172)
Total comprehensive income (loss), net of tax	7,267	1,674	778

Condensed balance sheet

in € m.	Dec 31, 2022	Dec 31, 2021
Assets:		
Cash and central bank balances:	148,680	153,899
Interbank balances (w/o central banks):		
Bank subsidiaries	12,250	13,265
Other	5,218	4,742
Central bank funds sold, securities purchased under resale agreements, securities borrowed:		
Bank subsidiaries	0	0
Nonbank subsidiaries	11,588	39,253
Other	11,478	7,552
Financial assets at fair value through profit or loss:		
Bank subsidiaries	3,022	1,083
Nonbank subsidiaries	1,288	1,234
Other	424,988	430,102
Financial assets at fair value through other comprehensive income	50,283	48,612
Investments in associates	297	236
Investment in subsidiaries:		
Bank subsidiaries	6,164	6,592
Nonbank subsidiaries	25,970	21,725
Loans:		
Bank subsidiaries	40,429	34,817
Nonbank subsidiaries	34,802	36,351
Other	364,094	352,176
Other assets:		
Bank subsidiaries	1,475	1,396
Nonbank subsidiaries	12,437	12,616
Other	116,599	92,967
Total assets	1,271,062	1,258,617
Liabilities and equity:		
Deposits:		
Bank subsidiaries	25,880	25,927
Nonbank subsidiaries	14,957	16,460
Other	529,060	497,726
Central bank funds purchased, securities sold under repurchase agreements and securities loaned:		
Bank subsidiaries	468	570
Nonbank subsidiaries	22,960	48,891
Other	584	762
Financial liabilities at fair value through profit or loss:		
Bank subsidiaries	4,151	1,493
Nonbank subsidiaries	1,217	859
Other	350,084	365,005
Other short-term borrowings:		
Bank subsidiaries	61	27
Nonbank subsidiaries	698	956
Other	4,874	3,789
Other liabilities:		
Bank subsidiaries	1,398	1,028
Nonbank subsidiaries	6,370	5,291
Other	101,256	77,702
Long-term debt	150,670	162,108
Total liabilities	1,214,687	1,208,592
Total shareholders' equity	47,797	41,720
Additional equity components	8,578	8,305
Total equity	56,375	50,025
Total liabilities and equity	1,271,062	1,258,617

Condensed statement of cash flows

in € m.	2022	2021	2020
Net cash provided by (used in) operating activities	5,522	(12,829)	20,605
Cash flows from investing activities:			
Proceeds from:			
Sale of financial assets at fair value through other comprehensive income	13,307	49,020	37,446
Maturities of financial assets at fair value through other comprehensive income	15,847	18,646	29,093
Sale of debt securities held to collect at amortized cost	0	30	8,239
Maturities of debt securities held to collect at amortized cost	5,585	4,743	3,961
Sale of equity method investments	117	21	30
Sale of property and equipment	7	93	12
Purchase of:			
Financial assets at fair value through other comprehensive income	(34,484)	(42,011)	(75,890)
Debt Securities held to collect at amortized cost	(15,780)	(5,922)	(3,359)
Investments in associates	(97)	(8)	(3)
Property and equipment	(237)	(464)	(387)
Net change in investments in subsidiaries	622	1,516	3,427
Other, net	(1,066)	(965)	(927)
Net cash provided by (used in) investing activities	(16,180)	24,698	1,642
Cash flows from financing activities:			
Issuances of subordinated long-term debt	2,672	1,099	1,668
Repayments and extinguishments of subordinated long-term debt	(42)	(25)	(1,120)
Issuances of trust preferred securities	0	0	0
Repayments and extinguishments of trust preferred securities	0	0	0
Principal portion of lease payments	(445)	(462)	(479)
Common shares issued	0	0	0
Purchases of treasury shares	(695)	(346)	(279)
Sale of treasury shares	0	35	76
Additional Equity Components (AT1) issued	2,000	2,500	1,153
Additional Equity Components (AT1) repaid	(1,750)	0	0
Purchases of Additional Equity Components (AT1)	(759)	(1,230)	(709)
Sale of Additional Equity Components (AT1)	785	1,210	721
Coupon on additional equity components, pre tax	(479)	(363)	(349)
Net change in noncontrolling interests	0	0	0
Cash dividends paid to Deutsche Bank shareholders	(406)	0	0
Net cash provided by (used in) financing activities	879	2,417	681
Net effect of exchange rate changes on cash and cash equivalents	2,378	755	(799)
Net increase (decrease) in cash and cash equivalents	(7,400)	15,042	47,295
thereof: Group internal merger	0	0	25,166
Cash and cash equivalents at beginning of period	144,741	129,699	82,405
Cash and cash equivalents at end of period	137,341	144,741	129,699
Net cash provided by (used in) operating activities include			
Income taxes paid (received), net	464	13	916
Interest paid	8,736	5,182	6,324
Interest received	19,415	13,288	15,905
Dividends received	1,391	1,468	724
Cash and cash equivalents comprise			
Cash and central bank balances (not included Interest-earning time deposits with central banks)	131,763	138,800	124,549
Interbank balances (w/o central banks)	5,578	5,941	5,151
Total	137,341	144,741	129,699

Parent company's long-term debt by earliest contractual maturity

in € m.	Due in 2023	Due in 2024	Due in 2025	Due in 2026	Due in 2027	Due after 2027	Total Dec 31, 2022	Total Dec 31, 2021
Senior debt:								
Bonds and notes:								
Fixed rate	12,749	9,912	8,432	10,927	9,622	10,513	62,155	61,469
Floating rate	1,421	2,235	3,023	2,398	575	4,926	14,579	18,184
Other	25,907	1,180	645	640	454	32,683	61,509	72,549
Subordinated debt								
Bonds and notes:								
Fixed rate	25	0	2,504	1,946	2,455	2,684	9,614	7,157
Floating rate	1,876	26	190	0	0	487	2,578	2,467
Other	125	25	0	42	20	23	235	283
Total long-term debt	42,102	13,379	14,794	15,954	13,126	51,314	150,670	162,108

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Supervisory Board of Deutsche Bank Aktiengesellschaft:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Deutsche Bank Aktiengesellschaft ("the Company") as of December 31, 2022 and 2021, the related consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2022, the related notes and the specific disclosures described in Note 1 to the consolidated financial statements as being part of the financial statements (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 13, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Valuation of level 3 financial instruments and related inputs not quoted in active markets

Description of the Matter Management uses valuation techniques to establish the fair value of level 3 financial instruments and related inputs not quoted in active markets. The Group held level 3 financial assets and financial liabilities measured at fair value of EUR 26,675 million and EUR 10,815 million as of December 31, 2022. The relevant financial instruments are reported within financial assets and liabilities at fair value through profit or loss, and financial assets at fair value through other comprehensive income. Information on the valuation techniques, models and methodologies used in the measurement of fair value is provided in notes 1 and 13 of the notes to the consolidated financial statements.

Financial instruments and related inputs that are not quoted in active markets include structured derivatives valued using complex models; more-complex OTC derivatives; distressed debt; highly-structured bonds; illiquid loans; credit spreads used to determine valuation adjustments (Credit Valuation Adjustment); and other inputs which cannot be observed mainly for instruments with longer-dated maturities.

Auditing the valuation of level 3 financial instruments and related inputs not quoted in active markets was complex due to the valuation techniques and models being utilized and the unobservability of the significant inputs used.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design and tested the operating effectiveness of the controls over management's processes to determine fair value of financial instruments and determination of significant unobservable inputs therein. This includes controls relating to independent price verification; independent validation of valuation models, including assessment of model limitations; monitoring valuation model usage; and calculation of fair value adjustments.

We evaluated the valuation techniques, models and methodologies, and tested the significant inputs used in those models. We performed an independent revaluation of a sample of derivatives and other financial instruments at fair value that are not quoted in active markets, using independent models and inputs. We also independently assessed the reasonableness of a sample of proxy inputs used, by comparing them to market data sources and evaluated their relevance to the underlying positions.

In addition, we evaluated the methodology and inputs used by management in determining fair value adjustments against the requirements of IFRS 13 and performed recalculations for a sample of these valuation adjustments using our own independent data and methodology.

We involved internal financial instruments valuation specialists in the procedures related to valuation models, independent revaluation and fair value adjustments.

Inclusion of forward-looking information in the model-based calculation of expected credit losses

Description of the Matter

As of December 31, 2022, the Group recognized an allowance for credit losses of EUR 5,615 million, with EUR 1,426 million relating to stage 1 and stage 2 allowances. Information on the inclusion of forward-looking information into the model-based calculation of expected credit losses and their adjustments for stages 1 and 2 is provided in notes 1 and 19 of the notes to the consolidated financial statements.

The estimated probabilities of default (PD) used in the model-based calculation of expected credit losses on non-defaulted financial instruments (IFRS 9 stage 1 and stage 2) are based on historical information, combined with current economic developments and forward-looking macroeconomic forecasts (e.g., gross domestic product and unemployment rates). Statistical techniques are used to transform the base scenario for future macroeconomic developments into multiple scenarios. These scenarios are the basis for deriving multi-year PD curves for different rating and counterparty classes, which are used in the calculation of expected credit losses.

Given the economic uncertainties from the war in Ukraine, potential energy shortages in Europe, rising inflationary pressures and related risks to the global economy, the estimation of forward-looking information requires significant judgment. To reflect these uncertainties, management must assess whether to make adjustments to its standard process for inclusion of macroeconomic variables into the expected credit loss model and forecasting methods, either by adjusting the macroeconomic variables or through the inclusion of management overlays.

Auditing the forward-looking information, included in the model-based calculation of expected credit losses, and any adjustment thereof, was complex due to the economic uncertainty and use of judgment.

How We Addressed the Matter in Our Audit

We obtained an understanding of the processes implemented by management, assessed the design of the controls over the selection, determination, monitoring and validation of forward-looking information in respect of the requirements under IFRS 9, and tested their operating effectiveness.

We evaluated management's review of its expected credit loss model and forecasting methods conducted through the model validation process. Furthermore, we evaluated the methods used to include the selected variables in the baseline scenario and the multi-scenario analysis.

We assessed the baseline macroeconomic forecasts by comparing them with the macroeconomic forecasts published by external sources.

We also evaluated the methodology applied by management to determine whether to adjust its standard process for inclusion of macroeconomic variables or to adjust the model results through management overlays. In doing so, we assessed the results of management's sensitivity analysis and compared the macroeconomic variables used to our own benchmark analysis. We also assessed that the adjustments were included in the calculation of expected credit losses according to management's methodology.

To assess the inclusion of forward-looking information in the model-based calculation of expected credit losses, we involved internal credit risk modelling specialists to assist us.

Measurement of goodwill for the Asset Management cash-generating unit

Description of the Matter

As of December 31, 2022, the Group reported goodwill of EUR 2,919 million that was exclusively allocated to its Asset Management cash-generating unit (CGU). Information on the measurement of goodwill is provided in notes 1 and 23 of the notes to the consolidated financial statements.

For purposes of the impairment test, the recoverable amount of the Asset Management CGU is calculated using the discounted cash flow model. In this context, significant assumptions are made regarding the earnings projections, the discount rate and the long-term growth rate. The discount rate is derived using the Capital Asset Pricing Model.

Auditing the measurement of goodwill for the Asset Management CGU involved a high degree of judgment due to the earnings projections, discount rate and long-term growth rate contained in the discounted cash flow model.

How We Addressed the Matter in Our Audit

We obtained an understanding of the process for preparing the earnings projections and calculating the recoverable amount of goodwill for the Asset Management CGU. In this respect, we also obtained an understanding of management's controls regarding the earnings projections, the discount rate and the long-term growth rate, assessed the design of such controls and tested their operating effectiveness.

We analyzed the significant assumptions described above with a focus on significant changes in the planning assumptions compared with the prior year. In this regard, we assessed the consistency and reasonableness of the significant assumptions used in the discounted cash flow model by comparing them with external market expectations.

In analyzing the expected future cash flows of the Asset Management CGU, we compared the earnings projections with the prior fiscal year's projections and the actual results achieved and evaluated any significant deviations. Furthermore, we assessed the significant valuation parameters used for the estimate of the recoverable amount, such as the discount rate and long-term growth rate, to the extent they are within a range of externally available forecasts.

To assess the above assumptions made in the recoverability of goodwill, we involved internal business valuation specialists.

Recognition and measurement of deferred tax assets

Description of the Matter As of December 31, 2022, the Group reported net deferred tax assets of EUR 6,687 million. Information on the recognition and measurement of deferred tax assets is provided in notes 1 and 34 of the notes to the consolidated financial statements.

The recognition and measurement of deferred tax assets is based on the estimation of the ability to utilize unused tax losses and deductible temporary differences against potential future taxable income. This estimate is based, among others, on assumptions regarding forecasted operating results based upon the approved business plan. Auditing the deferred tax assets was complex because of the use of judgment in estimation of future taxable income and the ability to use tax losses.

How We Addressed the Matter in Our Audit We obtained an understanding of the process to determine whether deductible temporary differences and unused tax losses are identified and measured in accordance with the provisions of tax law and rules for accounting for deferred taxes under IAS 12, evaluated the design and tested the operating effectiveness of the related controls.

We tested the assumptions used to develop and allocate elements of the approved business plan as a basis for estimating the future taxable income of the relevant group companies and tax groups.

Furthermore, we evaluated the recognition of deferred tax assets by analyzing the key assumptions made in estimating future taxable income. We assessed the estimates made in the forecasted operating results by comparing the underlying key assumptions with historical and prospective data available externally. We compared the historical forecasts with the actual results. In addition, we assessed the estimated tax adjustments and we performed sensitivity analyses on the utilization periods of the respective deferred tax assets.

To assess the assumptions used in the recoverability of the deferred taxes, we involved our tax professionals and internal business valuation specialists.

/s/ Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft

We have served as the Company's auditor since 2020.

Eschborn/Frankfurt am Main, Germany

March 13, 2023

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Compensation Report

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Introduction

The Compensation Report for the year 2022 provides detailed information on compensation in Deutsche Bank Group.

As relevant for compensation determination purposes, the stated financial figures are prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board ("IASB") and endorsed by the European Union ("EU"), including application of fair value hedge accounting for portfolio hedges of interest rate risk (fair value macro hedges) in accordance with the EU carve-out version of IAS 39.

Compensation Report for the Management Board and the Supervisory Board

The Compensation Report for the Management Board and the Supervisory Board for the 2022 financial year was prepared jointly by the Management Board and the Supervisory Board of Deutsche Bank Aktiengesellschaft (hereinafter: Deutsche Bank AG or the bank) in accordance with Section 162 of the German Stock Corporation Act. The Compensation Report describes the fundamental features of the compensation systems for Deutsche Bank's Management Board and Supervisory Board and provides information on the compensation granted and owed by Deutsche Bank in the 2022 financial year to each incumbent or former member of the Management Board and Supervisory Board.

The Compensation Report fulfills the current legal and regulatory requirements, in particular of Section 162 of the German Stock Corporation Act and the Remuneration Ordinance for Institutions (InstitutsVergV) and takes into account the recommendations set out in the German Corporate Governance Code (GCGC). It is also in compliance with the applicable requirements of the accounting rules for capital market-oriented companies (German Commercial Code (HGB), International Financial Reporting Standards (IFRS)) as well as the guidelines issued by the working group Guidelines for Sustainable Management Board Remuneration Systems.

Employee Compensation Report

This part of the compensation report discloses information with regard to the compensation system and structure that applies to the employees in Deutsche Bank Group. The report provides details on the Group Compensation Framework and it outlines the decisions on Variable Compensation for 2022. Furthermore, this part contains quantitative disclosures specific to employees identified as Material Risk Takers (MRTs) in accordance with the Remuneration Ordinance for Institutions (*Institutsvergütungsverordnung – InstVV*).

Compensation of the Management Board

Principles for Management Board Compensation

Responsibility and procedures for setting and reviewing Management Board compensation

The Supervisory Board as a whole is responsible for the decisions on the design of the compensation system as well as for setting the individual compensation amounts and procedures for awarding the compensation. The Compensation Control Committee supports the Supervisory Board in its tasks of designing and monitoring the implementation of the system and prepares proposals for resolutions for the Supervisory Board. As necessary, the Compensation Control Committee issues recommendations for the Supervisory Board to make adjustments to the system. In the case of significant changes, but at least every four years, the compensation system for the Management Board is submitted to the General Meeting for approval in accordance with Section 120a (1) of the German Stock Corporation Act. The compensation system was last approved by the General Meeting 2021 by a majority of 97.76%.

On the basis of the approved compensation system, the Supervisory Board sets the target total compensation for each Management Board member for the respective financial year, while taking into account the scope and complexity of the respective Management Board member's functional responsibilities, the length of service of the Management Board member on the Management Board as well as the company's financial situation. In the process, the Supervisory Board also considers the customary market compensation, also based on both horizontal and vertical comparisons, and sets the upper limit for total compensation (maximum compensation) (additional information is provided in the section "Appropriateness of Management Board compensation and compliance with the set maximum compensation").

Guiding principle: Alignment of Management Board compensation to corporate strategy

Deutsche Bank aims to make a positive contribution to its clients, employees, investors and society in general by fostering economic growth and social progress. Deutsche Bank would like to offer its clients solutions and provide an active contribution to foster the creation of value by its clients. This approach is also intended to ensure that Deutsche Bank is competitive and profitable and can operate on the basis of a strong capital and liquidity position. Deutsche Bank is committed to a corporate culture that appropriately aligns risks and revenues.

Building on a stable and promising foundation with a balanced business model, prudent risk management and a strong balance sheet, Deutsche Bank has outlined its strategy for the Group for the period up to 2025 at the Investor Deep Dive in March 2022 aiming for sustainable profitable growth. The aim is an average annual revenue growth of 3.5 to 4.5%. At the same time, there is a commitment to remain disciplined on costs to free up capacity for investments and improving the operational leverage. The aim is to push the cost/income ratio below 62.5% by 2025 while at the same time generating an attractive return on tangible equity above 10%. The capital distribution objectives are to be achieved through a combination of dividends and share repurchases, with a payout ratio of 50% from 2025 onwards. The bank will continue to focus on conduct and controls and follow a clear management agenda to change the way of working, to become even more innovative and to remain an employer of choice.

In the interests of the shareholders, the Management Board compensation system is aligned to the business strategy as well as the sustainable and long-term development of Deutsche Bank and provides suitable incentives for a consistent achievement of the set targets. Through the composition of total compensation comprising fixed and variable compensation components, through the assessment of performance across short-term and long-term periods and through the consideration of relevant, challenging performance parameters, the implementation of the Group strategy and the alignment with the sustainable and long-term performance of the Group are rewarded in a clear and understandable manner. The structure of the targets and objectives therefore comprises a balanced mix of both financial and non-financial parameters and indicators.

Through the structuring of the compensation system, the members of the Management Board are motivated to achieve the targets and objectives linked to Deutsche Bank's strategy, to work individually and as a team continually towards the long-term positive development of Deutsche Bank, without taking on disproportionately high risks. The Supervisory Board thus ensures there is always a strong link between compensation and performance in line with shareholder interests ("pay for performance connection").

Compensation principles

The design of the compensation system and thus the assessment of individual compensation amounts are based on the compensation principles outlined below. The Supervisory Board takes them into consideration when adopting its resolutions in this context:

Corporate strategy	The compensation system for the Management Board members is closely linked to Deutsche Bank's strategy, thereby focusing their work on its implementation and the long-term positive development of the Group, without taking disproportionate risks.
Shareholders' interests	The interests of shareholders are always taken into account when designing the specific structure of the compensation system, determining individual compensation amounts and structuring the means of compensation allocation and delivery.
Individual and collective objectives	Setting individual, divisional and collective objectives fosters not only the sustainable and long-term development of each of the business divisions, infrastructure areas or regions the Management Board members are responsible for, but also the performance of the Management Board as a collective management body.
Long-term perspective	A long-term link to Deutsche Bank's performance is secured by setting a greater percentage of long-term objectives in comparison to short-term objectives and by granting variable compensation exclusively in deferred form and mostly as share-based compensation with vesting and holding periods of up to seven years.
Sustainability	Objectives in accordance with Deutsche Bank's Environmental, Social and Governance (ESG) strategy provide incentives for acting responsibly, also in the context of sustainability, and thus make an important contribution to Deutsche Bank's long-term performance.
Appropriateness and upper limits (caps)	The appropriateness of the compensation amounts is ensured through the review of the compensation based on a horizontal comparison with peers and a vertical comparison with the workforce as well as suitable compensation caps on the achievable variable compensation and maximum compensation.
Transparency	By avoiding unnecessary complexity in the structures and through clear and understandable reporting, the transparency of the compensation system is increased in accordance with the expectations of investors and the public as well as the regulatory requirements.
Governance	The structuring of the compensation system and the assessment to determine the individual compensation take place within the framework of the statutory and regulatory requirements.

Compensation-related developments in 2022

Development of business and alignment of Management Board compensation to corporate strategy in 2022

Management Board compensation is closely aligned to Deutsche Bank's strategic targets. All the individual and collective objectives agreed with the Management Board members as well as their assessment parameters for the 2022 financial year were discussed by the Compensation Control Committee at the beginning of the year and subsequently resolved on by the Supervisory Board. The objectives serve overall in fostering the strategic transformation of the Group. The achievement levels determined for the objectives for the 2022 financial year at the beginning of the year 2023 reflect the extent to which the individual objectives were achieved and thus contributed to the Bank's performance.

Over the past three and a half years Deutsche Bank has managed to transform itself under the management team. By refocusing the business around core strengths, the bank has become significantly more profitable, better balanced and more cost-efficient. Thanks to disciplined execution of the strategy, the bank has been able to support its clients through highly challenging conditions, proving its resilience with strong risk discipline and sound capital management.

Profit before tax amounted to € 5.6 billion at the end of 2022. This is an increase of 65% over the previous year and the highest result for fifteen years. Post-tax return on tangible equity rose to 9.4%. Revenues increased by 7% to € 27.2 billion on the back of increased client business. At the same time, Deutsche Bank has further reduced costs by 5% to € 20.4 billion. The cost/income ratio fell from 85 to 75% for the full year.

Reflecting the profitability of all business segments in 2022, the Corporate Bank and the Private Bank were the most important growth drivers with revenue increases of 23% and 11% respectively. Both divisions also achieved record profits. Corporate Bank net revenues were € 6.3 billion in 2022, up 23% year on year, with 39% growth in net interest income and 7% growth in commission and fee income. Private Bank net revenues were € 9.2 billion, up 11% year on year. The Investment Bank's continued success in Fixed Income and Currencies more than compensated for the slowdown in Origination & Advisory last year, and revenues increased by 4%. In Asset Management, revenues fell by 4% to € 2.6 billion, less sharply than in almost all major markets.

The 2022 results demonstrate the benefits of Deutsche Bank's transformation efforts. The bank delivered revenue growth in its core businesses and continued cost reductions. The risk provisions are in line with guidance, despite challenging conditions. Focused de-risking of the balance sheet has contributed to the solid capital ratio and the completion of the Capital Release Unit's journey marks a major milestone in its transformation execution.

The individual objectives are bundled in the short-term component (Short-Term Award (STA)) and account for a share of 40% of the target total variable compensation. The Supervisory Board determined an achievement level for these components for the 2022 financial year of between 105.69% and 127.54%. The performance of the Management Board as a collective body is reflected in the long-term component (Long-Term Award (LTA)), which accounts for a share of 60% of the target total variable compensation. Overall, the achievement level of the collective objectives based solely on the 2022 financial year was 86.29%. This achievement level accounts for 60% of the Long-Term Award to be granted for the 2022 financial year. 30% will be for the 2023 financial year and 10% for the 2024 financial year. As achievement levels for prior years (at 30% from 2021 and 10% from 2020) also affected the Long-Term Award for the 2022 financial year, the achievement level of this component for the 2022 financial year was 79.60% based on the weighted achievement levels of the three financial years. Details on the individual achievement levels are presented as an overview in this report under the heading "Application of the compensation system in the financial year".

Management Board Changes and Compensation Decisions in 2022

Stuart Lewis resigned as member of the Management Board and Chief Risk Officer with effect from the day of the General Meeting on May 19, 2022. The appointment of his successor, Olivier Vigneron, took place with effect from May 20, 2022. Olivier Vigneron initially worked for Deutsche Bank as Senior Group Director (Generalbevollmächtigter), starting as of March 1, 2022. As a result, a smooth transition of tasks and responsibilities of the Chief Risk Officer could be ensured.

The Management Board comprised 10 members throughout 2022 with a proportion of women of 20%.

The Supervisory Board reviews the compensation levels of the members of the Management Board annually and regularly engages external compensation advisors to support the review, while assuring that these advisors are independent from the Management Board and Deutsche Bank. In 2022, the Supervisory Board conducted a review of the compensation levels taking into account comparable companies (peer groups) with the support of the external compensation advisor. On the basis of the results of this review and taking into account other aspects such as the duration of membership in the Management Board or changes in the area of responsibility within the Management Board, the Supervisory Board has taken the following compensation decisions in 2022:

The overall target compensation for Olivier Vigneron in his capacity as member of the Management Board and Chief Risk Officer was set at the level of compensation of other Management Board members with responsibility for an infrastructure area or a region. This corresponds to a target value of € 6.5 million p.a. The total target compensation is therefore 7.14% below the total target compensation of his predecessor.

In March 2022, James von Moltke was appointed 'President' of Deutsche Bank AG in addition to his duties as Chief Financial Officer (CFO). This appointment leads to an extension in his area of responsibility within the Management Board and additional tasks. Taking into account the extended area of responsibility and his senior membership in the Management Board already in the sixth year, the Supervisory Board decided to increase his total target compensation by € 400k p.a. to € 7.4 million p.a. with effect from 1 July 2022. This represents an increase of 5.71%.

Fabrizio Campelli successfully took over responsibility for the Corporate Bank and the Investment Bank from Christian Sewing on 1 May 2021 in a smooth takeover. The review of the compensation levels by the external compensation advisor showed that his positioning within the two peer groups of the International and European Banks with an overall target compensation of € 6.5 million p.a. is lower compared to the positioning of the other Management Board members. In addition, his appointment as a member of the Management Board was extended for a further three years. For these reasons, the Supervisory Board decided to increase the total target compensation to € 7 million p.a. which represents an increase of 7.69%. The increase took effect at the same time as the extension of his appointment with effect from 1 November 2022.

In 2022 the Management Board acknowledged that the use of non-authorized communication channels among staff represents a cultural shortcoming at Deutsche Bank. Therefore, the Management Board wanted to set a cultural signal and proposed to the Supervisory Board that, as part of performance management, this should have an impact on individual compensation. Thus, all Management Board members active on 31 December 2021 agreed to reduce variable compensation for the financial year 2021 by each EUR 75,000. The reduction will be achieved through the reduction of the Restricted Incentive Awards due on 1 March 2023 in the amount above.

When determining the variable compensation for the financial year 2022, the Supervisory Board took positive account of the financial milestones achieved and the contributions of the individual members of the Management Board to this success in their performance evaluation. In addition, the Management Board has continued its remediation activities with strong

commitment and with various measures taken to meet the high expectations of the regulators; however, despite recent progress, the Supervisory Board believes that the overall extended timeline on which the remediation has taken place and the re-planning and/or missed milestones in certain areas need to be recognized in the Management Board's compensation. For this reason, the Supervisory Board, acting on a proposal from the Compensation Control Committee, reduced the individual achievement level with regards to the Short-Term Award calculated on the basis of the individual performances by 5% for all members of the Management Board active in the financial year. Details on how to calculate the Short-Term Award are presented in this report under the heading "Application of the compensation system in the financial year".

Approval of the Compensation Report 2021 by the Annual General Meeting 2022

The Compensation Report 2021 for members of the Management Board and Supervisory Board of Deutsche Bank as published on March 11, 2022, was submitted to the ordinary General Meeting on May 19, 2022, for approval in accordance with Section 120a (4) of the German Stock Corporation Act. The General Meeting approved the Compensation Report with a majority of 88.03%.

Improvements compared to the Compensation Report 2021

While last year's Compensation Report was in principle well received by shareholders, we constantly strive to improve the quality of the Group's reporting. In the interests of our shareholders, the bank provides more information this year and thus increases transparency by

- Providing further comprehensive rationale for decisions on changes related to Management Board compensation
- Enhancing information on individual objectives including the overall achievement levels for each Management Board member
- Disclosing Balanced Scorecard Key Performance Indicators (KPIs) for the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) including overall achievement levels
- Introducing summaries of the performance assessment for the CEO and CFO for the Short-Term Award (STA) components of the individual objectives and the annual priorities
- Extending the Long-Term Award (LTA) table for the Group Component to include target/actual values and achievement levels
- Providing a detailed overview of the 3-year assessment period showing the individual achievement grades to evaluate the overall achievement level for each LTA component
- Providing an outlook on objectives to be set for 2023, including improvements on the compensation structures for the Management Board with effect from 2023

Principles governing the determination of compensation

Structure of the Management Board compensation system

The compensation system consists of fixed and variable compensation components. The fixed compensation and variable compensation together form the total compensation for a Management Board member. The Supervisory Board defines target and maximum amounts (caps) for all compensation components.

Management Board Compensation System 2022

Components	Objective	Implementation
Fixed Compensation		
Base salary	The base salary rewards the Management Board member for performing the respective role and responsibilities. The fixed compensation is intended to ensure a fair and market-oriented income and to ensure that undue risks are avoided. In addition, Management Board members are granted recurrent, fringe benefits and contributions for pension benefits.	- Monthly payment; Annual base salary of between € 2.4 million and € 3.6 million
Fringe benefits		- Company car and driver services as well, if applicable moving expenses, housing allowance, insurance premiums and reimbursement of business representation expenses
Pension		- A single and contractually agreed annually pension plan contribution or allowance of € 650,000 for adequate pension provision
Variable Compensation		
Short Term Award (STA)	The STA rewards the individual value contribution of each member of the Management Board to achieving short- and medium-term objectives in accordance with the corporate strategy. It consists of three elements, which are tailored to the role and responsibilities of the Management Board member and can be individually influenced by the level of achievement by the Management Board member.	<ul style="list-style-type: none">- 40 % of the total variable compensation with 3 elements related to individual performance<ul style="list-style-type: none">(1) Individual objectives (20 %);(2) Individual Balanced Scorecard (10 %);(3) Annual priorities (10 %)- Maximum target level 150 %- Assessment period 1 year- Earliest possible disbursement in 4 tranches in Restricted Incentive Awards (cash-based) - 1, 3, 5 and 7 years after being granted- Target amount for 100 % achievement level: Between € 1.640 million and € 2.160 million
Long Term Award (LTA)	Within the determination of the variable compensation, the focus is on achieving long-term objectives linked to the strategy. To underline this, the Supervisory Board has set the focus on this component with a share of the LTA of 60 % of the total variable target compensation. For the LTA, the Supervisory Board sets collective objectives for the members of the Management Board. An important part of the LTA is the ESG factor. Since its implementation in 2021 and further development, Deutsche Bank's sustainability strategy has been systematically linked to the Management Board compensation	<ul style="list-style-type: none">- 60 % of total variable compensation with 4 group targets<ul style="list-style-type: none">(1) ESG factor (20 %);(2) Relative total shareholder return (15 %);(3) Organic capital growth (15 %);(4) Group component (10 %)- Maximum target level 150 %- Assessment period of 3 years with weightings of 60 % (Financial Year (FY)), 30 % (FY+1), 10 % (FY+2)- Disbursement in 4 tranches exclusively in Restricted Equity Awards (share-based) – earliest possible delivery after 2, 3, 4, 5 years plus a holding period in each case of 1 year after grant- Target amount for 100 % Achievement level: Between € 2.460 million and € 3.240 million

Overview

Compensation components			Maximum	Deferral aspects	Additional topics	
Variable	Short Term Award – weighting 40% Individual objectives (assessment period = 1 year) <ul style="list-style-type: none">• 20% Individual objectives• 10% Individual Balanced Scorecards• 10% Annual Priorities		150%	Cash-based* Tranche vesting	Subject to: Forfeiture provisions Clawback provisions	Shareholding Guidelines Severance pay Change of control
	Long Term Award – weighting 60% Collective objectives (assessment period = 3 years) <ul style="list-style-type: none">• 20% ESG• 15% Relative Total Shareholder Return• 15% Organic Capital Growth• 10% Group Component			<ul style="list-style-type: none">• Share-based• Tranche vesting• 1 year holding period		
Fixed	Base salary		100%			
	Pension plan / allowance					
	Fringe benefits					

* Unless the Supervisory Board decides to grant (portions of) the STA in individual cases as share-based awards to meet the Shareholding Guidelines requirements.

Detailed information on the compensation system for members of the Management Board of Deutsche Bank AG is available on the company's website: https://hauptversammlung.db.com/files/documents/2021/HV_2021_Verguetungssystem_fuer_die_Mitglieder_des_Vorstands.pdf.

Composition of the target total compensation and maximum compensation

The Supervisory Board determines for each Management Board member a target (reference) total compensation on the basis of the compensation system approved by the General Meeting. It also determines, in accordance with the recommendation of the German Corporate Governance Code, what relative proportions the fixed compensation on the one hand and short-term and long-term variable compensation on the other hand have in the target total compensation. In this context, the Supervisory Board ensures in particular that the variable compensation linked to achieving long-term objectives exceeds the portion of variable compensation linked to short-term objectives.

When setting the target total compensation for each member of the Management Board, the Supervisory Board takes into account the scope and complexity of the respective Management Board member's functional responsibility as well as the experience and length of service of the member on the Management Board. Furthermore, the compensation amounts are reviewed for their appropriateness on the basis of market data for suitable peer groups. On the basis of these criteria, the Supervisory Board set the relative percentages for the compensation components within the target total compensation as follows:

Relative shares of the total annual target compensation allocated to the different compensation components (%)

Compensation components	Relative share of total compensation in %
Base Salary	~ 33-37%
Regular fringe benefits	~ 1%
Pension service costs / pension allowance	~ 7-9%
Short-Term Award	~ 22-23%
Long-Term Award	~ 33-34%
Reference total compensation	100%

The compensation of the Management Board members is limited (capped) in several ways (maximum compensation).

Pursuant to Section 25a (5) of the German Banking Act (Kreditwesengesetz – KWG), the ratio of fixed to variable compensation is generally limited to 1:1 (cap regulation), i.e. the amount of variable compensation must not exceed that of fixed compensation, unless the shareholders of a bank resolve to increase the ratio of fixed to variable compensation to up to 1:2. The General Meeting in May 2014 made use of this possibility and increased the ratio to 1:2.

The Supervisory Board additionally limited the maximum possible achievement levels for the short-term objectives (STA) and long-term objectives (LTA) consistently to 150 % of the target variable compensation. Furthermore, it specified an additional amount limit (cap) for the aggregate amount of base salary, STA and LTA of € 9.85 million. This means that even with target achievement levels that would lead to higher compensation amounts, compensation is capped at a maximum of € 9.85 million. After the target achievement level is assessed, if the calculation should result in variable compensation or total compensation that exceeds one of the specified caps, the variable compensation is to be reduced. This is to take place through a pro rata reduction of the STA and LTA.

Target and maximum amounts of base salary and variable compensation

in €	2022				2021
	Base salary	Short-Term Award	Long-Term Award	Total compensation ¹	Total compensation ¹
CEO					
Target value	3,600,000	2,160,000	3,240,000	9,000,000	9,000,000
Maximum value	3,600,000	3,240,000	4,860,000	9,850,000	9,850,000
Presidents ^{2,3}					
Target value	3,000,000	1,760,000	2,640,000	7,400,000	7,400,000
Maximum value	3,000,000	2,640,000	3,960,000	9,600,000	9,600,000
Ordinary Board Member responsible for Corporate Bank and Investment Bank (CB & IB) ³					
Target value	2,800,000	1,680,000	2,520,000	7,000,000	6,500,000
Maximum value	2,800,000	2,520,000	3,780,000	9,100,000	8,550,000
All other Ordinary Board Members ³					
Target value	2,400,000	1,640,000	2,460,000	6,500,000	6,500,000
Maximum value	2,400,000	2,460,000	3,690,000	8,550,000	8,550,000

¹ Limit the maximum total amount of basic salary and variable compensation to the upper limit set by the Supervisory Board.

² Presidents and Ordinary Board members responsible for Private Bank (PB)/ Asset Management (AM) and Finance (CFO).

³ For further details on compensation decision, please refer to chapter "Management Board Changes and Compensation Decisions in 2022" in this report.

In addition, in accordance with Section 87a (1) sentence 2 No. 1 of the German Stock Corporation Act, the Supervisory Board also set an upper limit for the maximum total compensation of € 12 million for each Management Board member (Maximum Compensation). The Maximum Compensation is set consistently for all Management Board members. The Maximum Compensation corresponds to the sum of all compensation components for any financial year. This comprises not only the base salary, STA and LTA, but also the fringe benefits and service costs for the company pension plan or pension allowances.



Application of the compensation system in the financial year

Fixed compensation

The fixed compensation components in the form of base salary, fringe benefits and contributions to the pension plan or pension allowances were granted in the financial year as fixed compensation and in accordance with the individual agreements in the service contracts. Due to the requirements of Section 25a (5) of the German Banking Act and in accordance with the decision of the Annual General Meeting in May 2014, the ratio of fixed to variable compensation is generally limited to 1:2 (cap rule). Therefore, when determining the amount of base salary as part of the target compensation, it must be taken into account that the variable compensation may not exceed the maximum value of 200% of the fixed compensation.

The expenses for fringe benefits and pension service costs vary in their annual amounts. Although the contribution to Deutsche Bank's pension plan is defined consistently for all Management Board members, the amounts to be contributed by Deutsche Bank during the year in the form of pension service cost accruals vary, however, based on the length of service on the Management Board within the financial year, the age of the Management Board member and actuarial figures (additional information is provided in the section "Benefits upon regular contract termination").

Variable compensation

The Supervisory Board, based on the proposal of the Compensation Control Committee, determined the variable compensation for the Management Board members for the 2022 financial year. Variable compensation comprises two components, a short-term component (Short-Term Award (STA)) with a weighting of 40% and a long-term component (Long-Term Award (LTA)) with a weighting of 60% in relation to the target variable compensation.

All objectives, measurements and assessment criteria that were used for the assessment of performance for the 2022 financial year are derived from Deutsche Bank's strategy and are in line with the compensation system approved by the General Meeting. The objectives were selected to set suitable incentives for the Management Board members, to promote the development of Deutsche Bank's earnings and the alignment to the interests of shareholders as well as to fulfill Deutsche Bank's social responsibility through the inclusion of sustainability aspects and climate protection. The challenging objectives reflect the Bank's ambitions. If the objectives are not achieved, the variable compensation can be zero; in the case of over-achievement, the maximum achievement level is limited to 150% of the target value.

Balance of financial and non-financial objectives

Financial and non-financial objectives are considered in a balanced way when setting the objectives. In relation to the total variable compensation, there was a greater focus on financial objectives in the 2022 financial year, with a weighting of around 68%. Both the financial and non-financial objectives were chosen in such a way that they are quantitatively or qualitatively measurable at the end of the financial year. Around 75% of the targets are quantitatively measurable and a portion of around 25% is measured qualitatively.

Short-Term Award (STA)

The amount of the **Short-Term Award** for the 2022 financial year is based on the achievement level during the assessment period of the short-term individual and divisional objectives. The assessment period coincides with the financial year and is one year.

The Short-Term Award comprises the following three elements with different weightings:

- Individual Objectives (50%)
- Individual Balanced Scorecards (25%)
- Annual Priorities (25%)

For each of these components, the Supervisory Board determines the achievement level based on a clearly structured year-end assessment process at the beginning of the following year. The achievement of the three components determines the overall achievement level for each Management Board member which in turn determines the amount of the short-term component for the preceding financial year.

Determination of the cash value of the Short-Term Award

	Short-Term Award (40%)		
	Individual Objectives (50%)	Balanced Scorecard (25%)	Annual Priorities (25%)
Target Amount ¹	820,000 - 1,080,000	410,000 - 540,000	410,000 - 540,000
Target Achievement Level	0% - 150%	0% - 150%	0% - 150%
Overall Target Amount per STA component	0 - 1,620,000	0 - 810,000	0 - 810,000
Overall Target Amount STA	0 - 3,240,000		

¹ Target amount differs depending on the Management Board member's functional responsibility. On the basis of 100%. Pro rata temporis upon joining or leaving during the year.

Individual objectives

The Supervisory Board sets personal and divisional objectives (Individual Objectives) for each member of the Management Board at the beginning of the year. The weightings of each of these objectives as well as relevant quantitatively or qualitatively measurable performance criteria for their assessment are defined as well. The objectives are chosen so that they are challenging, ambitious and sufficiently concrete in order to ensure there is an appropriate alignment of performance and compensation and that the "pay-for-performance" principle is taken into account.

The Individual Objectives are derived from the corporate strategy and foster its implementation. They are set for each Management Board member in consideration of her or his respective area of functional responsibility and the contribution of this area of functional responsibility to advancing Deutsche Bank's overall strategy. ESG objectives such as the further development of the sustainability strategy or the promotion of measures to improve regulatory remediation are also included as individual objectives. Individual Objectives can also be defined as project or regional targets. Besides operational measures, the implementation of strategic projects and initiatives can be agreed as objectives as well, if they are directly instrumental in the implementation of the strategy, by contributing to, for example, the structure, organization and sustainable development of Deutsche Bank.

At the beginning of the 2022 financial year, between 4 and 7 Individual Objectives were set with different weightings for each Management Board member. For these objectives, the Supervisory Board has assigned clear expectations and financial and/or non-financial performance criteria at the beginning of the year, such as financial Key Performance Indicators (KPIs), achievements of milestones, Chief Executive Officer (CEO) and/or Supervisory Board feedback, stakeholder Feedback and qualitative assessments. These enable the Supervisory Board to objectively assess the performance contribution of the respective Management Board member towards the concrete execution of the objectives.

At year-end, the determination of the achievement levels follows a pre-defined process. In a first step, all members of the Management Board perform an initial self-assessment of the achievement levels of their objectives. The self-assessed achievement levels are then discussed in conversations with the Chief Executive Officer (CEO) and the Chairman of the Compensation Control Committee. Based on the feedback from these conversations, the Compensation Control Committee prepares a proposal for the Supervisory Board for its decision. For this purpose the achievement levels are combined into an average for each Management Board member according to pre-defined weightings.

The following overview shows the objectives as well as the achievement levels as resolved on by the Supervisory Board for each Management Board member.

Management Board Member	Weighting (in %)	Individual objectives	Achievement Level (in %)
Christian Sewing	25%	Further develop Deutsche Bank's long-term vision & positioning	131.50%
	20%	Deliver on Deutsche Bank Group short-term strategy execution and milestones	
	15%	Further evolve Deutsche Bank culture	
	15%	Provide oversight to Human Resources transformation including Real Estate	
	15%	Further develop Bank-wide ESG & Sustainable Banking Strategy	
	10%	Strengthen positioning with key political stakeholders	
James von Moltke	30%	Ensure execution of Group financial plan through Group Performance Management	126.75%
	15%	Drive development of new strategy	
	15%	Drive investor and Rating Agencies engagement	
	10%	Deliver Balance Sheet & Liquidity Optimization	
	10%	Deliver Liquidity Remediation Program	
	10%	Execute Group Finance strategy, incl. Financial & Analytics enhancement	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct.	
Karl von Rohr	30%	Deliver on strategy execution for the division Private Bank incl. efficiency, growth and sustainable profitability	131.75%
	10%	Support CEO in developing new strategy and achieving Group financial targets	
	15%	Ensure delivery on critical remediation activities within the area of financial crime	
	20%	Support DWS strategy through oversight role	
	15%	Provide oversight for Regions Germany & EMEA	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	
Fabrizio Campelli	30%	Deliver on strategy execution and sustainable profitability for the divisions Corporate Bank and Investment Bank	130.00%
	20%	Improve controls and demonstrate their effectiveness to regulators for Corporate Bank and Investment Bank	
	20%	Drive development of new strategy for Corporate Bank and Investment Bank	
	10%	Drive stronger F2B alignment for Corporate Bank and Investment Bank	
	10%	Provide oversight to Region UK and Ireland	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	
Bernd Leukert	35%	Execute strategy for the division Technology, Data & Innovation (TDI) and evolve TDI priorities in line with the 25 strategy	122.00%
	20%	Technology: Continue improvement of estate	
	20%	Data: Drive quality enhancements	
	15%	Innovation: Drive client-centric technology approach across DB	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	
Alexander von zur Mühlen	40%	Execute and evolve APAC strategy in line with the 2025 strategy	123.50%
	30%	Strengthen APAC franchise and client focus	
	20%	Foster control culture and deliver on critical remediation activities within the area of financial crime for the APAC region	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	
Christiana Riley	40%	US regulatory remediation and engagement including delivery on critical remediation activities within the area of financial crime for the Americas and 2022 Comprehensive Capital Analysis and Review (CCAR)	119.00%
	30%	Execute and evolve America's strategy in line with the 2025 strategy	
	20%	Strengthen client engagement	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	
Rebecca Short	25%	Execute transformation agenda	120.00%
	20%	Drive CRU reductions	
	20%	Drive global cost reduction	
	15%	Drive Procurement excellence	
	10%	Support development of new strategy and financial aspiration	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	

Professor Dr. Stefan Simon	40%	Drive delivery on critical remediation activities within the area of financial crime	122.50%
	15%	Drive strategic engagement with regulatory authorities	
	15%	Further drive down bank-wide litigation portfolio	
	10%	Drive build out and operationalize CAO Controls Framework	
	10%	Drive overhaul of CAO policy setting and implementation	
	10%	Support CEO in further evolution of Deutsche Bank culture, with a focus on integrity and conduct	
Olivier Vigneron (Member since May 20, 2022)	50%	Foster a strong risk-return culture and continue to strengthen the risk organization	105.00%
	20%	Strengthen Non-Financial Risk Management	
	20%	Further address regulatory and internal audit findings	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	
Stuart Lewis (Member until May 19, 2022)	25%	Foster a strong risk-return culture throughout the organization	121.25%
	20%	Handover to successor	
	20%	Further address regulatory and internal audit findings	
	15%	Continue to develop and strengthen the risk organization	
	10%	Vendor Management remediation	
	10%	Support CEO in further evolution of DB culture, with a focus on integrity and conduct	

For the qualitative objectives, the Supervisory Board has formulated expectations and financial and/or non-financial performance criteria at the beginning of the year, which enable it to objectively assess the performance contribution of the respective Management Board members with regard to the concrete implementation of an objective for the performance year at the beginning of the following year. The degrees of achievement thus determined for the individual objectives are consolidated into an average for each Management Board member according to the weightings defined in advance. The degree of target achievement determined accordingly is multiplied by the target amount of 50% of the variable target remuneration of the STA. This results in the calculated payout amount for the component of the individual objectives.

Pay-for-performance summary for CEO and CFO for the STA Individual objectives

Management Board Member	Individual Objectives – Pay for Performance Summary
Christian Sewing (CEO)	<p>The Supervisory Board acknowledged Christian Sewing's success in delivering Deutsche Bank's best financial result in 15 years meeting key financial targets and objectives for 2022. Mr. Sewing ensured the execution and completion of Deutsche Bank's transformation agenda and positioned the bank for future growth. Christian Sewing continued to drive Deutsche Bank's long-term vision and further developed the 2025 Global Hausbank-strategy.</p> <p>Christian Sewing optimized the organizational structure to ensure direction and leadership across the entire bank. He further evolved Deutsche Bank's work culture and operating model to encourage good leader- and partnership by launching the 'Leadership Kompass' across the bank. Doing this, he not only strengthened Deutsche Bank's values and advertised eight corresponding leadership behavior rules but at the same time, Mr. Sewing sharpened the Bank's integrity and conduct culture profile. He continued putting a focus on regulatory remediation activities and improving data & controls. Critical audit findings could be closed during 2022, however, the Supervisory Board believes that the necessary intensity in some areas of the remediation activities across the Bank should be improved and requires stronger focus. Mr. Sewing has accelerated the opening of the Berlin Tech Centre including the successfully transfer of ~700 colleagues from Russia to ensure continued prospect technology development. Mentionable was also the improvement of the diversity ratio within Deutsche Bank for Vice Presidents, Directors and Managing Directors roles to 37.7% under his leadership.</p> <p>The Supervisory Board acknowledged that Mr. Sewing also succeeded in further strengthening Deutsche Bank's positioning as a sustainable institution by evolving the Bank-wide Environment-Social-Governance (ESG) & Sustainability Strategy. Mr. Sewing committed to a sustainable Finance volume target of 500 billion Euro at the end of 2025 and drove the disclosure of sectoral decarbonization targets in alignment with the net zero commitment. Mr. Sewing led the Group toward stronger client centricity and fostered the positioning of Deutsche Bank as a strategic advisor on ESG matters for corporate clients. At the same time, he managed to strengthen Deutsche Bank's political and regulatory positioning and capabilities through his accelerated engagement in Germany and internationally. He acted as an input provider in interaction formats with government representatives and regularly participated in trips with the federal government.</p>
James von Moltke (CFO)	<p>The Supervisory Board recognized the efforts under James von Moltke's leadership that have impacted the Finance organization and the wider group positively. All of Mr. von Moltke's objectives have been achieved or mostly achieved. In his role as Vice-Chair of the Strategy Working Group, he has been a strong driver of the Global 'Hausbank' 2025 strategy and developed a compelling financial plan for 2025 and beyond balancing future investment needs to facilitate sustained business growth, cost efficiency and capital distributions. The Supervisory Board acknowledged Mr. von Moltke's proactive dialogue with equity and credit investors as well as credit rating agencies, the latter contributing to 4 upgrades throughout the challenging previous 18 months in turn supporting business growth and funding costs.</p> <p>James von Moltke successfully executed the group's expense plans in close collaboration with the Chief Transformation Officer, including for instance a thorough review of the portfolio of key initiatives and additional measures. Remediation Programs are on track to achieve important milestones however, the Supervisory Board believes that the necessary intensity in some areas of the remediation activities across the Bank should be improved and requires stronger focus. Mr. von Moltke continued to deliver on a disciplined monthly Performance Review process across all businesses and infrastructure functions in order to increase transparency about revenues, risk and costs, control KPIs, especially focused on identifying adverse trends and developments early and to enable the Management Board to take appropriate mitigating actions. In addition, the Balanced Scorecard framework has been continuously updated to reflect current Group and divisional priorities and to allow for appropriate and aligned performance measurement and organizational steering.</p> <p>The Supervisory Board acknowledged that Mr. von Moltke extended his focus on innovation to foster efficiency and future success of the Finance organization. Tangible outcomes to date have been the successful implementation of the dbAgile@Scale set up across Finance' change portfolio which allows for faster, adaptive and value-adding delivery of change initiatives. The Supervisory Board also appreciated that Mr. von Moltke continued to lead function and firm while role modeling tone from the top on integrity, as evidenced by the absence of any misconduct of regulatory relevance within the entire Finance division.</p>

105.00% - 131.75%

Range of Management Board members' achievement levels on the Individual Objectives for 2022

Individual Balanced Scorecard

Balanced Scorecards make it possible to have an overview of key performance indicators and transform strategic objectives into operating practices through concrete actions and consequent cascading into the organization. With the Balanced Scorecards, the Bank has an appropriate tool for the steering and control of key performance indicators that can be used to check the achievement level of financial and non-financial objectives against pre-defined measurement parameters at any time and to measure them transparently for the performance year at the beginning of the following year. At the same time, the Balanced Scorecards provide an overview of the priorities of the individual divisions across the entire Group.

Based on the functional responsibilities according to the Business Allocation Plan for the Management Board, each Management Board member is assigned at least one individual Balanced Scorecard and a maximum of 4 Balanced Scorecards. If more than one Balanced Scorecard is assigned to a Management Board member, these are weighted to each other based on the size of the activities. Four Management Board members have more than one Balanced Scorecard due to their multiple functional and/or divisional responsibilities. The table below shows the number of Balanced Scorecards and their respective weightings.

Balanced Scorecards for Management Board Members in 2022

Management Board Member	Weightings	Balanced Scorecard
Christian Sewing	60%	Group / Chairman
	40%	Human Resources / Corporate Real Estate
James von Moltke	100%	Chief Financial Office
Karl von Rohr	40%	Private Bank
	40%	Asset Management
	10%	Region Germany
	10%	Region Europe, the Middle East and Africa (EMEA)
Fabrizio Campelli	35%	Corporate Bank
	35%	Investment Bank
	20%	Corporate Bank & Investment Bank Operations and Control
	10%	Region UKI
Bernd Leukert	100%	Technology, Digitalization & Innovation
Alexander von zur Mühlen	100%	Region APAC
Christiana Riley	100%	Region Americas
Rebecca Short	50%	Chief Transformation Office including Global Procurement
	50%	Capital Release Unit
Professor Dr. Stefan Simon	100%	Chief Administrative Office
Olivier Vigneron ¹		
Stuart Lewis ²	100%	Chief Risk Office

¹ Member since May 20, 2022

² Member until May 19, 2022

The respective Management Board members' functional responsibilities are linked with pre-defined key financial figures and non-financial targets from up to three categories. The three categories are:



A total of 56 Key Performance Indicators (KPIs) are assigned to these categories, of which a set of 8 to 21 KPIs are embedded in each individual Balanced Scorecard depending on the Management Board member's area of functional responsibility. The methodology for the Balanced Scorecards has been further developed since their introduction in 2018 and adjusted to meet the developing focus. For example, in order to foster aspects of Environmental, Social and Governance (ESG) aspects in the compensation system, since 2021 ESG topics have been given an even greater consideration in the Balanced Scorecards and also in the Long-Term Award (LTA).

The KPIs within the individual categories are set at the beginning of the year for each Management Board member individually along with corresponding target, thresholds and corresponding assessment parameters. In addition, a weighting is set for each category. The weightings that the individual categories have within the overall Balanced Scorecard can be up to 65% depending on the functional responsibility of the Management Board member. The KPIs of the Balanced Scorecards are measured continuously throughout the year, but the overall assessment is made at the end of the year.

The calculation logic for determining the final levels of achievement for each Management Board member is as follows:

In a first step, the achievement band of each KPI is determined. If a minimum threshold value is not reached, the achievement level for this KPI is set at zero. Once a maximum limit for a KPI has been reached, the achievement level is set at 150%. For a clear overview, the Balanced Scorecard shows if each individual KPI was fulfilled or exceeded based on the defined assessment criteria ("green"), or only achieved to less than 100% ("amber") or not achieved ("red").

In a second step, the achievement level for each category is calculated taking into account the assessment of the KPIs from the first step and the resulting bands applicable to the respective category. When all objectives of a category are exceeded, the achievement level for a category can be up to 150%. However, if none of the minimum threshold values of a category is met, the achievement level is 0%.

In a third step, an overall achievement level for the individual Balanced Scorecard is derived from the achievement levels of the categories and their weightings.

Individual Chairman Balanced Scorecard for Christian Sewing ¹

KPI Categories	Weight KPI Category	KPI	2022 Achievement	Achievement level
Financial performance/ Capital & Risk	50%	Direct adjusted cost base	The "Direct adjusted cost base" KPI measures the cost target for the Chairman's division. "Adjusted costs" means that litigation, severance and restructuring and impairment costs are excluded from the target. In 2022, the direct adjusted cost base was €459m, ~3% below target.	125%
		Direct adjusted cost base – Group	The "Direct adjusted cost base" for Deutsche Bank Group was €19.9bn in 2022, ~1.5% above target.	
		Leverage ratio – Group	The "Leverage ratio" is the Bank's core capital as a percentage of its total leverage exposure pursuant to the definitions of the Capital Requirements Regulation/Capital Requirements Directive. The external leverage ratio target for 2022 of 4.6% was met.	
		NFRM composites control	The "Non-Financial Risk Management" control target is a composite metric based on weighted scorings of 3 Key Components: (1) Framework Implementation Adherence, (2) Risk Control Assessment and (3) Risk Identification. In 2022, the target score of 01.49 was overachieved with a score of 01.00.	
Culture, control & Conduct/ Franchise	50%	Red Flags	"Red Flags" are assigned for breaches of relevant risk-related policies and control processes. While the target would have allowed up to one Red Flag in the Chairman's division, there were no Red Flags in 2022.	
		Culture Pulse Survey	The "Culture Pulse Survey" KPI is measured by the straight average of favorable responses of five culture-related questions. The target for 2022 of 75% was overachieved with a result of 77%.	
		Gender Diversity (VP/D/MD)	The "Gender Diversity" KPI is the share of female among Vice President, Director, Managing Director population within Deutsche Bank Group. The target of 39.9% for the Chairman's area was clearly overachieved with a share of 41% in 2022.	
		Overdue findings (F3/F4)	The "Overdue findings" KPI counts the number of overdue findings including "significant" and "critical" findings covering i) internal and ii) regulatory findings. In 2022 there were on average 1.5 overdue findings vs. a target of 0.	
		Media reputation	The "Media reputation" KPI for the Group is an index on tonality of DB's media coverage provided by external provider Unicepta (base: DB's global media list). The target score of 0 on a scale from (1), purely negative, to 1, purely positive, was almost reached by a score for 2022 of (0.05).	
		ESG ratings index	The "ESG rating index" is the equally weighted indexed value of the scores/ratings achieved in the Bank's core five ESG ratings. The 2022 score was 117.00 vs. a target of 122.00.	

¹ The Group/ Chairman Balanced Scorecard represents one of the two Balanced Scorecards for the CEO (Group/Chairman and Human Resources / Corporate Real Estate). The overall Balanced Scorecard achievement level is determined based on a combination of both Balanced Scorecards.

Individual CFO Balanced Scorecard for James von Moltke

KPI Categories	Weight KPI Category	KPI	2022 Achievement	Achievement level
Financial performance/ Capital & Risk	60%	Direct adjusted cost base	The "Direct adjusted cost base" KPI measures the cost target for the Finance division. "Adjusted costs" means that litigation, severance and restructuring and impairment costs are excluded from the target. In 2022, the direct adjusted cost base was €567m, ~0.07% below target.	128%
		Direct adjusted cost base – Group	The "Direct adjusted cost base" for Deutsche Bank Group was €19.9bn in 2022, ~1.5% above target.	
		Leverage ratio – Group	The "Leverage ratio" reports the Bank's core capital as a percentage of its total leverage exposure pursuant to the definitions of the Capital Requirements Regulation/Capital Requirements Directive. The external leverage ratio target for 2022 of 4.6% was met.	
		NFRM composites control	The "Non-Financial Risk Management" control target is a composite metric based on weighted scorings of 3 Key Components: (1) Framework Implementation Adherence, (2) Risk Control Assessment and (3) Risk Identification. In 2022, the target score of 01.49 was overachieved with a score of 01.06.	
Culture, control & Conduct/ Franchise	30%	Red Flags	"Red Flags" are assigned for breaches of relevant risk-related policies and control processes. While the target would have allowed up to two Red Flag in the Finance division, there were no Red Flags in 2022.	
		Liquidity Risk Limit Discipline	The "Liquidity Risk Limit Discipline" KPI combines the Group Liquidity Coverage Ratio (LCR) and Group Stressed Net Liquidity Position into a single metric as a measure of liquidity risk limit discipline. The 2022 target value of 00.00 was 100% achieved.	
		Audit CEAG (12month average)	The "Control Environment Assessment Grade" is a score based on divisional performance across seven components relating to audit findings (closure, open, critical, overdue, repeat, self-identified, risk acceptance rate). The target score of 3 was almost achieved with a score of 2.93 for 2022.	
		Reference Data Adoption	The "Reference Data Adoption" KPI measures the fraction of records with the correct (relevant) Reference Data Service for each combination of Provision domain and their core process. In 2022, the target of 61% was not fully achieved with a final result of 52%.	
		Culture Pulse Survey	The "Culture Pulse Survey" KPI is measured by the straight average of favorable responses of five culture-related questions. The target for 2022 of 75% was almost achieved with a result of 74.44%.	
		Gender Diversity (VP/D/MD)	The "Gender Diversity" KPI is the share of female among Vice President, Director, Managing Director population within Deutsche Bank Group. The target of 35.70% for the Finance area was almost achieved with a share of 35.40% in 2022.	
		ESG ratings index	The "ESG rating index" is the equally weighted indexed value of the scores/ratings achieved in the Bank's core five ESG ratings. The 2022 score was 117.00 vs. a target of 122.00.	
Digitalization & innovation	10%	Application decommissioning benefits (allocation run-the-bank costs)	The "Application decommissioning benefits" KPI reports on the cost reduction benefit that will be achieved by decommissioning activities in the agreed and prioritized scope for the given year. 2022 costs benefits were €1.5m, 16% above target.	

Balanced Scorecard (illustrative functioning of the internal tracking tool)

KPI categories	Weight KPI Category	KPIs	Targets	Actuals	Achievement level	Achievement	Resulting band ¹	Assessment	Weighting x factor	Resulting sum
Financial performance and capital & risk	30 %	KPI 1	Target	Actuals	Achievement level		Green to amber (75-125%)	110 %	33 %	76 %
		KPI 2	Target	Actuals	Achievement level					
		KPI n	Target	Actuals	Achievement level					
Culture, control & conduct and franchise	50 %	KPI 1	Target	Actuals	Achievement level		Green to red (50%-100%)	70 %	35 %	
		KPI 2	Target	Actuals	Achievement level					
		KPI n	Target	Actuals	Achievement level					
Innovation & digitalisation	20 %	KPI 1	Target	Actuals	Achievement level		Amber to red (25-75%)	40 %	8 %	
		KPI 2	Target	Actuals	Achievement level					
		KPI n	Target	Actuals	Achievement level					

¹ Resulting bands of KPI categories: Green (100-150%); Green to amber (75-125%), Green to red (50-100%), Amber to red (25%-75%), Red (0%).

If a Management Board member has more than one Balanced Scorecard, an additional fourth step is carried out to determine a final overall achievement level based on the pre-defined weightings of the Balanced Scorecards.

Balanced Scorecard Achievement levels per Management Board Member

Management Board member	Balanced Scorecard achievement level (in %)
Christian Sewing	129.00%
James von Moltke	128.00%
Karl von Rohr	117.00%
Fabrizio Campelli	125.00%
Bernd Leukert	116.00%
Alexander von zur Mühlen	116.00%
Christiana Riley	100.00%
Rebecca Short	140.00%
Professor Dr. Stefan Simon	118.00%
Olivier Vigneron ¹	115.00%
Stuart Lewis ²	115.00%

¹ Member since May 20, 2022

² Member until May 19, 2022

100.00% - 140.00%

Range of Management Board members' Balanced Scorecard achievement levels for 2022

Annual Priorities

Uniform Annual Priorities are set for all Management Board members. The Supervisory Board assesses the profitability and performance-related contributions of each Management Board member towards pre-defined focus topics for the year. These focus topics are derived from, and intended to further support, Deutsche Bank's strategy. This component of the Short-Term Award (STA) provides the possibility to set operational focal points annually depending on the current priorities. The performance criteria to be used for the assessment can be of both a financial and non-financial nature.

For the 2022 financial year, the Supervisory Board specified the following focus topics as Annual Priorities:

- Constructive flexible responses to events/developments occurring during the performance year
- Key deliverables from the Balanced Scorecard that have not already been assessed under another objective

The Supervisory Board assesses how each individual member of the Management Board reacted to certain and sometimes unforeseen events and developments that occurred during the financial year, particularly from the risk management perspective. At the end of the year, the achievement level is assessed qualitatively.

Within the corporate strategy, the Supervisory Board assesses the achievement levels of Key Deliverables, such as One Bank Client Centricity, Decarbonization and Transformation Targets, Workforce Management and Optimization and Global Reporting that are related to the corporate strategy in the “Book of Work” assigned to the individual Management Board members and measured throughout the year. Each activity is in turn linked to measurement criteria, such as delivery of milestones on time versus plan, financial benefit thresholds and enhanced revenues over baseline that enable a quantitative measurement. Based on this, an individual level of achievement for the performance of each individual Management Board member can be derived at the end of the financial year.

Annual Priorities Achievement levels per Management Board Member

Management Board Member	Weighting (in %)	Annual Priorities	Achievement Level (in %)
Christian Sewing	50%	Constructive flexible responses to events/developments occurring in 2022	145.00%
	50%	Key deliverables from the Balanced Scorecards	
James von Moltke	50%	Constructive flexible responses to events/developments occurring in 2022	137.50%
	50%	Key deliverables from the Balanced Scorecards	
Karl von Rohr	50%	Constructive flexible responses to events/developments occurring in 2022	137.50%
	50%	Key deliverables from the Balanced Scorecards	
Fabrizio Campelli	50%	Constructive flexible responses to events/developments occurring in 2022	140.00%
	50%	Key deliverables from the Balanced Scorecards	
Bernd Leukert	50%	Constructive flexible responses to events/developments occurring in 2022	130.00%
	50%	Key deliverables from the Balanced Scorecards	
Alexander von zur Mühlen ¹	100%	Constructive flexible responses to events/developments occurring in 2022	122.50%
Christiana Riley	50%	Constructive flexible responses to events/developments occurring in 2022	125.00%
	50%	Key deliverables from the Balanced Scorecards	
Rebecca Short	50%	Constructive flexible responses to events/developments occurring in 2022	125.00%
	50%	Key deliverables from the Balanced Scorecards	
Professor Dr. Stefan Simon	50%	Constructive flexible responses to events/developments occurring in 2022	125.00%
	50%	Key deliverables from the Balanced Scorecards	
Olivier Vigneron (Member since May 20, 2022)	50%	Constructive flexible responses to events/developments occurring in 2022	120.00%
	50%	Key deliverables from the Balanced Scorecards	
Stuart Lewis (Member until May 19, 2022)	50%	Constructive flexible responses to events/developments occurring in 2022	122.50%
	50%	Key deliverables from the Balanced Scorecards	

¹ Balanced Scorecard key deliverables were not agreed for 2022.

Pay-for-performance summary for CEO and CFO for the STA Annual Priorities

Management Board Member	Annual Priorities – Pay for Performance Summary
Christian Sewing (CEO)	<p>The Supervisory Board considered the overall intense year 2022 with many challenges (not least the Ukraine war, Covid pandemic and Energy crisis) and acknowledged that at the same time it has been a strong year for Deutsche Bank, as reflected in the solid financial results and feedback from clients & other stakeholders. The Supervisory Board rewarded that under Christian Sewing's stewardship the Bank continued to build on its momentum from the Bank's transformation and strong revenue growth. Mr. Sewing managed to position Deutsche Bank being "part of the solution" and advisor to the government in the context of the inflationary pressures and energy crisis.</p> <p>The Supervisory Board acknowledged that Mr. Sewing drove the Management Board / Group Management Committee succession planning while working with the Head of Human Resources (HR) to increase HR organization impact as an active driver of key transformation topics. At the same time, he ensured strong progress against 2022 milestones including inter alia: The implementation of the Future of Work Framework in 34 countries (95% of global internal workforce), the establishment of the function of a Chief Sustainability Officer promoting ESG aspirations at group and divisional level as well as optimizing and executing the infrastructure location strategy.</p>
James von Moltke (CFO)	<p>The Supervisory Board rewarded James von Moltke's efforts to drive adherence to financial plan and delivery on financial targets in a turbulent period with a changing macro environment in 2022. Given the disruptions caused by the war in Ukraine and the Covid pandemic, Mr. von Moltke intensified his dialogue and deepened his relationships with leading clients and was likewise instrumental in the successful delivery of the Investor Deep Dive in 2022.</p> <p>In his role as chair of the deposit protection committee of the Bundesverband Deutscher Banken, Mr. von Moltke was one of the key drivers of the reset of the deposit protection scheme which was successfully concluded in 2022 and will result in risk reduction and positive financial benefits for financial institutions in the long-term. Furthermore in 2022, Mr. von Moltke accomplished a broad set of key objectives across Finance such as the roll-out of Driver Based Cost Management allocating central infrastructure cost more precisely to divisions enhancing transparency and ownership of infrastructure costs. Finally, he ensured adherence to ESG reporting standards and an improved governance framework.</p>

120.00 % - 145.00%

Range of Management Board members' Annual Priorities achievement levels for 2022

Overall achievement of the Short-Term Award

For the 2022 financial year, the following overall levels of achievement were determined for the members of the Management Board based on the level of achievement of the objectives linked to the three components defined by the Supervisory Board in the Short-Term Award:

Short-Term Award overall achievement

	Individual Achievement Level (in %)			Overall STA Achievement		
	Individual Objectives (50%)	Balanced Scorecard (25%)	Annual Priorities (25%)	Achievement level (in %)	Achievement level incl. 5% reduction (in %) ¹	Achievement level (in €)
Christian Sewing	131.50%	129.00%	145.00%	134.25%	127.54%	2,754,810
James von Moltke	126.75%	128.00%	137.50%	129.75%	123.26%	2,120,115
Karl von Rohr	131.75%	117.00%	137.50%	129.50%	123.03%	2,165,240
Fabrizio Campelli	130.00%	125.00%	140.00%	131.25%	124.69%	2,053,188
Bernd Leukert	122.00%	116.00%	130.00%	122.50%	116.38%	1,908,550
Alexander von zur Mühlen	123.50%	116.00%	122.50%	121.38%	115.31%	1,891,023
Christiana Riley	119.00%	100.00%	125.00%	115.75%	109.96%	1,803,385
Rebecca Short	120.00%	140.00%	125.00%	126.25%	119.94%	1,966,975
Professor Dr. Stefan Simon	122.50%	118.00%	125.00%	122.00%	115.90%	1,900,760
Olivier Vigneron ²	105.00%	115.00%	120.00%	111.25%	105.69%	1,064,039
Stuart Lewis ³	121.25%	115.00%	122.50%	120.00%	114.00%	798,000

¹ Reduction of the individual achievement levels for the short-term component by 5% for all Management Board members active in the financial year (see chapter "Management Board Changes and Compensation Decisions in 2022).

² Member since May 20, 2022

³ Member until May 19, 2022, Pro-rata to the duration of the service contract until 31 May 2022.

105.69% - 127.54%

Range of Management Board members' overall STA achievement levels for 2022

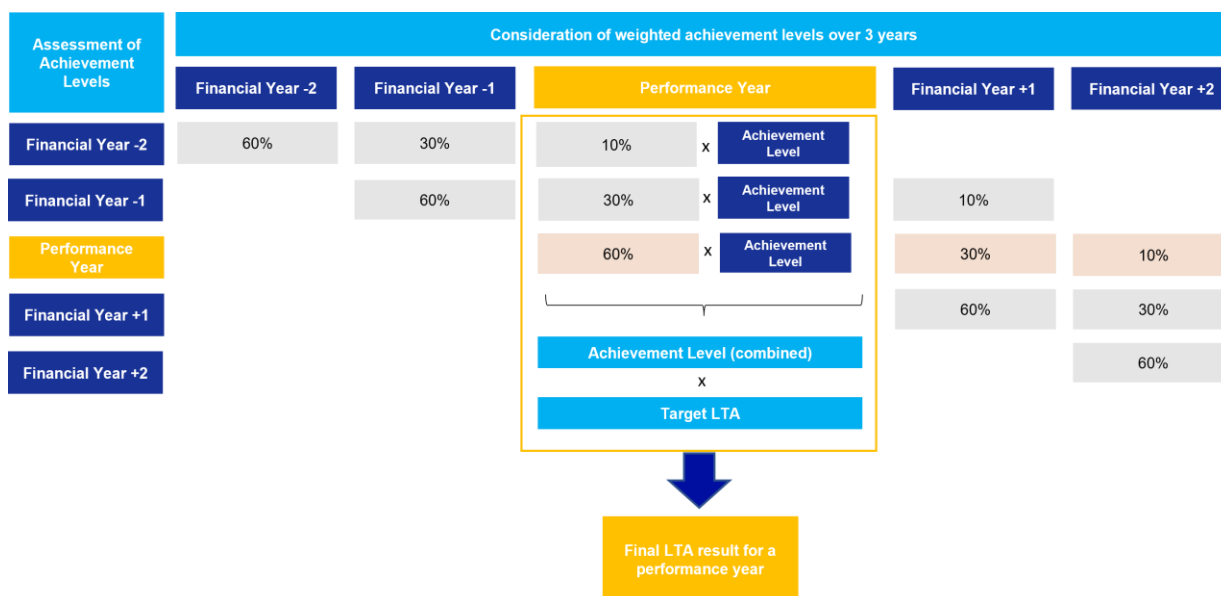
Long-Term Award (LTA)

When determining variable compensation, a significant focus is placed on the achievement of long-term objectives linked to Deutsche Bank's strategy. To emphasize this, the Supervisory Board decided that the Long-Term Award (LTA) will account for 60% of the total target variable compensation. At the beginning of each financial year, the Supervisory Board specifies the collective long-term objectives for the Management Board members for the LTA. The objectives and their weightings in the LTA for 2022 are:

- ESG Factor (33.33%)
- Relative Total Shareholder Return of the Deutsche Bank share (25%)
- Organic Capital Growth (25%)
- Group Component (16.67%)

All LTA objectives are assessed over a period of three years. 60% of the target compensation for each objective is multiplied by the target level achieved in the performance year and thus makes up the largest share for that respective financial year. 30% of the applicable objective target compensation is based on the achievement level for the preceding financial year and 10% is determined based on the achievement level for the financial year before that. This results in a weighted overall achievement level for the performance year.

Assessment period of three years



ESG

Deutsche Bank has set for itself the aim of spearheading sustainability initiatives such as decarbonization and thus contributing to a more environmentally, socially and financially well-governed economy. To link Management Board compensation closely and consistently to the Bank's sustainability strategy, the Supervisory Board resolved to combine the Bank's strategic sustainability targets in an Environmental, Social and Governance (ESG) component and to implement the results as one of the collective objectives within the LTA (ESG component).

The ESG component accounts for the largest portion of the LTA with a share of 33.33%. This corresponds to 20% of the total variable compensation and emphasizes the importance of the ESG agenda for Deutsche Bank. At the beginning of each financial year, the Supervisory Board sets targets as well as upper limits and lower limits for all the objectives bundled in the ESG component. The assessment of the achievement levels for the financial year takes place retrospectively. A linear calculation methodology is used to assess the achievement levels for the quantitative measurable KPIs (all except AML/KYC remediation activities) in the categories of 0% and 100%, 100% and 100% to 150%. The following table shows the target amounts, the results as of the end of the year and the resulting achievement level for the 2022 financial year:

ESG			Lower Limit (0%)	Target (100%)	Upper Limit (150%)	Result	Relative weight	Assessment
Environ- ment	Sustainable Finance	Increase in business with Sustainability financing and investments (without DWS) ¹	€ 210 bn (+€ 53 bn)	€ 260 bn (+€ 103 bn)	€ 330 bn (+€ 173 bn)	€ 231.2 bn	12.5%	42.4%
		Development of climate risk management – Publicly disclose carbon footprint of Corporate Loan book and pathway alignment for key sectors – Set reduction targets for carbon intensity levels by 2030 for key industry sectors by year end 2022 to align with Net Zero Banking Alliance commitment	Completion of target setting for 2 or less relevant key sectors.	Completion of target setting for 4 relevant key sectors.	Completion of target setting for 6 or more relevant key sectors	4 key sectors	10%	100%
	Own Operations	Total building/ energy consumption (kwh/squaremeter) vs. YE 2019	-15%	-17%	-19%	– -17%	7.5%	100%
Social	Employee Feedback Culture (latest survey result)		55%	75%	95%	73%	5%	90%
	Gender Diversity (Vice President/Director/Managing Director)		29.9%	30.7%	31.1%	30.70%	15%	100%
Governance	Control Environment Assessment Grade (Assessment & Group Audit Risk/Control Culture Grade) – annual average		2	3,5	5	2.4	12.5%	26.67%
	Anti-Money-Laudry / Know-Your-Client Remediation Activities		0%	100%	150%	50%	37.5%	50%
							100%	64.38%

¹ The target (+ € 103 billion for the ESG KPI) for Sustainable Finance and Investment was set at the beginning of the year 2022. Gross volume growth of € 74.20 billion was offset by a negative impact of new regulatory requirements (MiFID), resulting in € 58 billion reported at year-end 2022. However, this negative effect was not taken into account for the determination of target achievement.

ESG overall achievement level

Year	Weighted achievement levels over 3 years				
2020	10%	x	37.50%	=	3.75%
2021	30%	x	89.38%	=	26.81%
2022	60%	x	64.38%	=	38.63%

An overall achievement level for the ESG component for the 2022 financial year was calculated based on the weighted achievement levels for the seven sub-objectives and set at 64.38%. This results in a weighted overall achievement level of 69.19% for the three-year period for the portion of the LTA attributable to the ESG component.

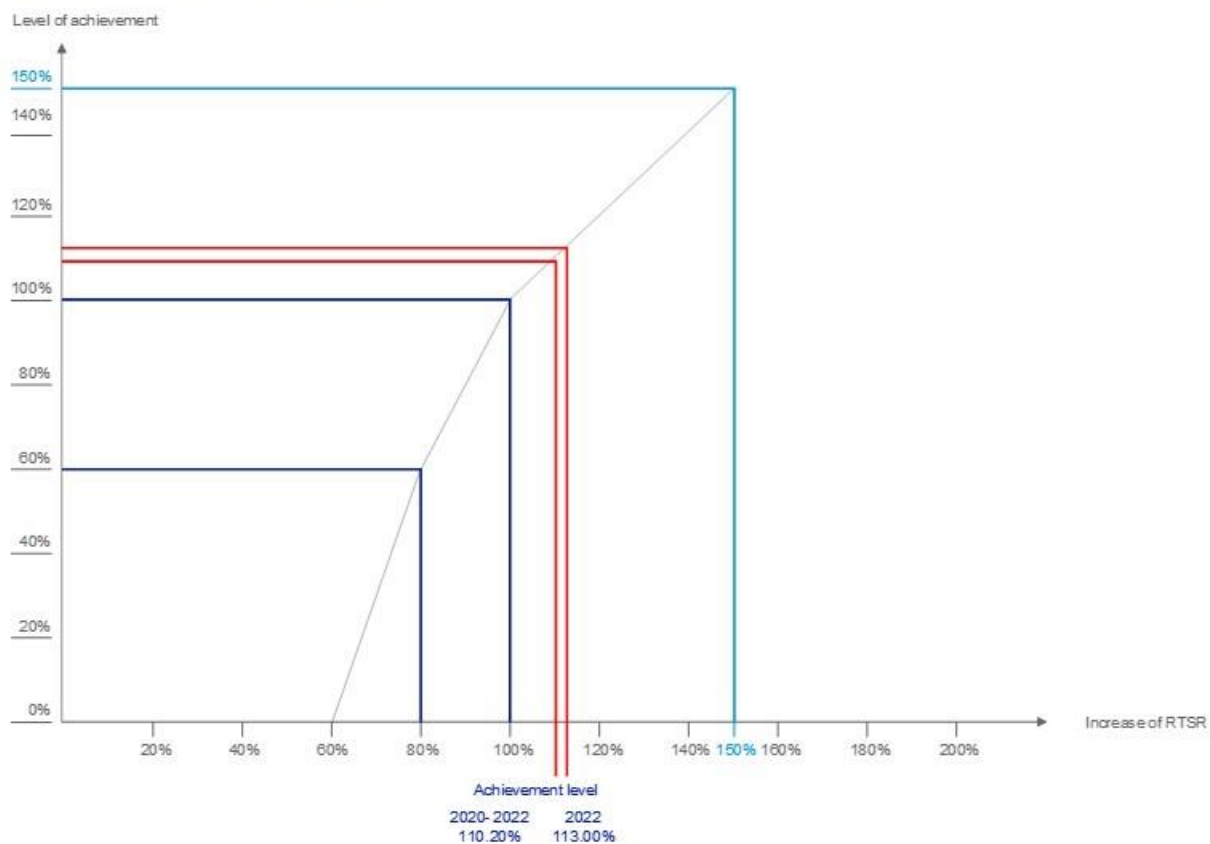
69.19% ESG achievement level for the LTA for the period for 2020-2022

Relative Total Shareholder Return (RTSR)

A key strategic target of the Bank is the performance of the Deutsche Bank share in comparison to the performance of the shares of its competitors (Relative Total Shareholder Return (RTSR)). The target for the RTSR for the Deutsche Bank share in comparison to selected financial institutions is intended to strengthen the sustainable performance of the Deutsche Bank share. The RTSR links the interests of the Management Board with those of shareholders. In addition, the RTSR provides a relative measurement of performance, creating an incentive to outperform the relevant peers. The total shareholder return is defined as the share price performance plus theoretically reinvested gross dividends. The RTSR is derived and calculated based on the total shareholder return of the Deutsche Bank share in relation to the average total shareholder returns of the peer group.

If the RTSR is greater than 100%, then the target achievement level increases proportionally to an upper limit of 150% of the target figure, i.e., the target achievement level increases by 1% for each percentage point above 100%. If the RTSR average is less than 100%, the target achievement level declines disproportionately. For each percentage point decline of the RTSR in the range of less than 100% and 80%, the target achievement level declines by two percentage points. For each percentage point decline of the RTSR in the range between less than 80% and 60%, the target achievement level declines by three percentage points. If the RTSR does not exceed 60% over the entire assessment period, the target achievement level is zero.

Increase of RTSR and level of achievement



The peer group used as the basis for calculating the RTSR is selected from among the companies with generally comparable business activities as well as a comparable size and international presence. The Supervisory Board reviews the composition of the peer group regularly. Since 2021 the peer group for the RTSR has comprised the following 11 banks: Banco Santander, Bank of America, Barclays, BNP Paribas, Citigroup, Credit Suisse, HSBC, JP Morgan Chase, Société Générale, UBS and UniCredit.

RTSR overall achievement level

Year	Weighted achievement levels over 3 years			
2020	10%	x	160.00%	= 16.00%
2021	30%	x	88.00%	= 26.40%
2022	60%	x	113.00%	= 67.80%

In 2022, Deutsche Bank's total shareholder return was higher compared to 8 out of 11 competitors in the peer group. The achievement level for the 2022 financial year came to 113%. This results in a weighted overall achievement level of 110.20% for the overall period of three years for the granting of the portion of the LTA attributable to the RTSR.

110.20 % RTSR achievement level for the LTA for the period for 2020-2022

Organic Capital Growth

Another key objective of Deutsche Bank is its growth. As an incentive for the Management Board members to promote growth, the Supervisory Board defined Organic Capital Growth on a net basis as a long-term objective for the LTA.

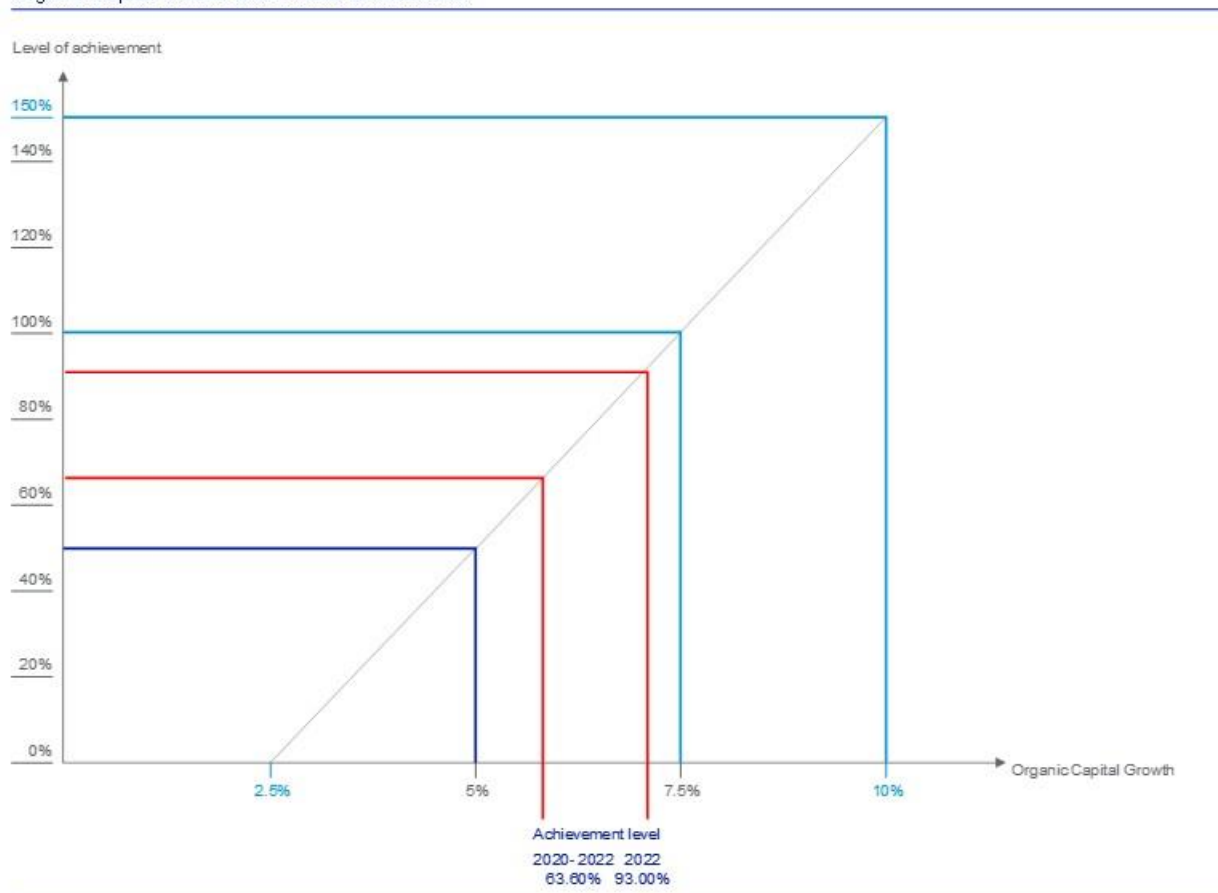
Organic Capital Growth is defined as the balance of the following changes (which are reported in the Consolidated Statement of Changes in Equity) occurring during the financial year, divided by total shareholders' equity as of December 31 of the preceding financial year:

- Total comprehensive income, net of tax
- Coupon on additional equity components, net of tax
- Remeasurement gains (losses) related to defined benefit pension plans, net of tax
- Option premiums and other effects from options on Deutsche Bank shares
- Net gains (losses) on treasury shares sold

Therefore, “inorganic” changes in equity, in particular the payment of a dividend or a capital increase, are of no relevance to the achievement of the objective.

Starting from an average Organic Capital Growth of 2.5% (lower limit), the target achievement level increases by 1% for each 0.05% of growth up to the 150% cap, which will be reached upon an Organic Capital Growth of 10% or more (upper limit cap). If capital growth does not exceed 2.5% in the assessment period, the target achievement level is zero.

Organic Capital Growth and level of achievement



Organic Capital Growth overall achievement level

Year	Weighted achievement levels over 3 years				
2020	10%	x	0%	=	0%
2021	30%	x	26.00%	=	7.80%
2022	60%	x	93.00%	=	55.80%

Organic Capital Growth pursuant to the definition specified above developed positively in 2022 at 7.16% and thus exceeded the threshold of the lower limit of 2.5%. This results in an achievement level of 93% for 2022 and in a weighted overall achievement level of 63.60% for the overall three-year period for the portion of the LTA attributable to Organic Capital Growth.

63.60 % **OCG achievement level for the LTA for the period for 2020-2022**

Group Component

Through the Group Component, the Supervisory Board links the key financial figures supporting the corporate strategy with the Management Board's compensation and thus establishes an incentive to sustainably foster the Bank's capital, risk, costs and earnings profile. The Group Component also provides a link to the compensation for employees, as this is an employee compensation system component.

Group Component		Target	Actuals	Achievement level
Common Equity Tier 1 capital ratio (in %)	The bank's Common Equity Tier 1 capital, as a percentage of the risk weighted assets for credit, market and operational risk.	>= 13.00%	13.4%	
Return on tangible equity (in %)	Net income (or loss) attributable to shareholders as a percentage of average tangible shareholders' equity. The latter is determined by deducting goodwill and other intangible assets from shareholders' equity	8%	9.4%	
Cost/Income Ratio (CIR) (in %)	Noninterest expenses as a percentage of total net revenues, which are defined as net interest income before provision for credit losses plus noninterest income.	70%	75%	80.00%
Sustainable Finance Volume ¹ (in € bn)	Volume of new financing, capital markets issuance and investments facilitated across Corporate Bank, Investment Bank and Private Bank in 2022, as defined under the 'Sustainable Finance Framework – Deutsche Bank Group'	80.00	74.20	

¹The target (+ € 80 billion for the GVC KPI) for Sustainable Finance and Investment was set at the beginning of the year 2022. Gross volume growth of € 74.20 billion was offset by a negative impact of new regulatory requirements (MiFID), resulting in € 58 billion reported at year-end 2022. However, this negative effect was not taken into account for the determination of target achievement.

Group component overall achievement level

Year	Weighted achievement levels over 3 years				
2020	10%	x	72.50%	=	7.25%
2021	30%	x	77.50%	=	23.25%
2022	60%	x	80.00%	=	48.00%

The achievement levels of all four equally weighted objectives of the Group Component was 80% in 2022. This results in a weighted overall achievement level of 78.50% for the overall three-year period for the portion of the LTA attributable to the Group Component.

78.50 % **Group Component achievement level for the LTA for the period for 2020-2022**

Long-Term Award overall achievement

	Achievement Levels (%)				Overall LTA Achievement	
	ESG-Factor (33.33%)	RTSR (25%)	Organic Capital Growth (25%)	Group component (16.67%)	Achievement level (in %)	Achievement level (in €)
Christian Sewing						2,578,932
James von Moltke						2,053,594
Karl von Rohr						2,101,352
Fabrizio Campelli						1,966,038
Bernd Leukert	69.19%	110.20%	63.60%	78.50%	79.60%	1,958,078
Alexander von zur Mühlen						1,958,078
Christiana Riley						1,958,078
Rebecca Short						1,958,078
Professor Dr. Stefan Simon						1,958,078
Olivier Vigneron ¹	64.38%	113.00%	93.00%	80.00%	86.29%	1,303,173
Stuart Lewis ²	69.19%	110.20%	63.60%	78.50%	79.60%	835,765

¹ Member since May 20, 2022. Long-term achievement level based on 1-year assessment period as the MB member joined Deutsche Bank on 1 March 2022..

² Member until May 19, 2022, duration of the service contract until 31 May 2022.

79.60% was the overall LTA achievement level for the period 2020-2022

Appropriateness of Management Board compensation and compliance with the set maximum compensation

The Supervisory Board regularly reviews the appropriateness of the individual compensation components as well as the amount of total compensation. The review of the appropriateness of Management Board compensation concluded that the Management Board compensation resulting from the achievement levels for the 2022 financial year is appropriate.

Horizontal appropriateness

Through the horizontal comparison, the Supervisory Board ensures that the target total compensation is appropriate in relation to the tasks and achievements of the Management Board as well as the company's situation and is also customary in the market. In this context, the level and structure of compensation, in particular, are examined at comparable companies (peer groups). Suitable companies in consideration of Deutsche Bank's market position (in particular with regard to business sector, size and country) are used as the basis for this comparison. The assessment of horizontal appropriateness takes place in comparison with the following three peer groups.

Peer Group 1:

This group consists of 11 global banks with

- a comparable business model; and
- a comparable size (measured by balance sheet total, number of employees and market capitalization).

The 11 institutions in this Peer Group are identical to the banks used to measure the Relative Total Shareholder Return (see Chapter "Relative return on shares"). These are the following: Banco Santander, Bank of America, Barclays, BNP Paribas, Citigroup, Credit Suisse, HSBC, JP Morgan Chase, Société Générale, UBS and UniCredit.

Peer Group 2:

This group consists of 16 European banks with

- a comparable business model; and
- a comparable size (measured by balance sheet total, number of employees and market capitalization).

These are the following banks: Banco Bilbao Vizcaya Argentaria, Banco Santander, Barclays, BNP Paribas, BPCE, Rabobank, Crdit Agricole, Crdit Mutuel, Credit Suisse, HSBC Holdings, ING Bank, Intesa Sanpaolo, Nordea Bank, Société Générale, UBS Group and UniCredit.

Peer Group 3:

This group includes the companies of the German Stock Index (DAX).

The horizontal appropriateness of the Management Board compensation is reviewed annually by the Supervisory Board. The Supervisory Board regularly engages external compensation advisors for the review of horizontal appropriateness, while assuring itself that these advisors are independent from the Management Board and Deutsche Bank. The Supervisory Board takes the results of the review into consideration when setting the target total compensation for the Management Board members.

Vertical appropriateness

In addition to the horizontal comparison, the Supervisory Board considers a vertical comparison, which compares the compensation of the Management Board and the compensation of the workforce. Within the vertical comparison, the Supervisory Board considers in particular, in accordance with the German Corporate Governance Code, the development of the compensation over time. This involves a comparison of the Management Board compensation and the compensation of two groups of employees. Taken into account are, on the one hand, the compensation of the senior management, which comprises the first management level below the Management Board and members of the top executive committees of the divisions, as well as of management board members of significant institutions within Deutsche Bank Group and of corresponding management board-1 level positions with management responsibility. The Management Board compensation is compared to, on the other hand, the compensation of all other employees of Deutsche Bank Group worldwide (tariff and non-tariff employees).

Compliance with the set maximum compensation (cap)

The maximum compensation limit (cap) is set at € 12 million for each Management Board member. This is based on the actual expense and/or actual disbursement of the compensation awarded for a financial year. The base salaries are fixed amounts. The expenses for fringe benefits vary from Management Board member to Management Board member in any given year. The contribution to Deutsche Bank's pension plan or pension allowance is set at the same amount for all Management Board members. However, the amount to be recognized by the Bank during the year for Deutsche Bank's pension service costs fluctuates based on actuarial variables. As the expense amount for the multi-year variable compensation components of the Short-Term Award (STA) and Long-Term Award (LTA) are not determined until up to seven years due to the deferral periods, compliance with the maximum compensation set for the 2022 financial year can only be conclusively reported within the framework of the Compensation Reports for the financial years up to 2030. Compliance with the maximum compensation limit as defined under Section 87a of the German Stock Corporation Act is, however, already ensured for the 2022 financial year.

Deferrals and holding periods

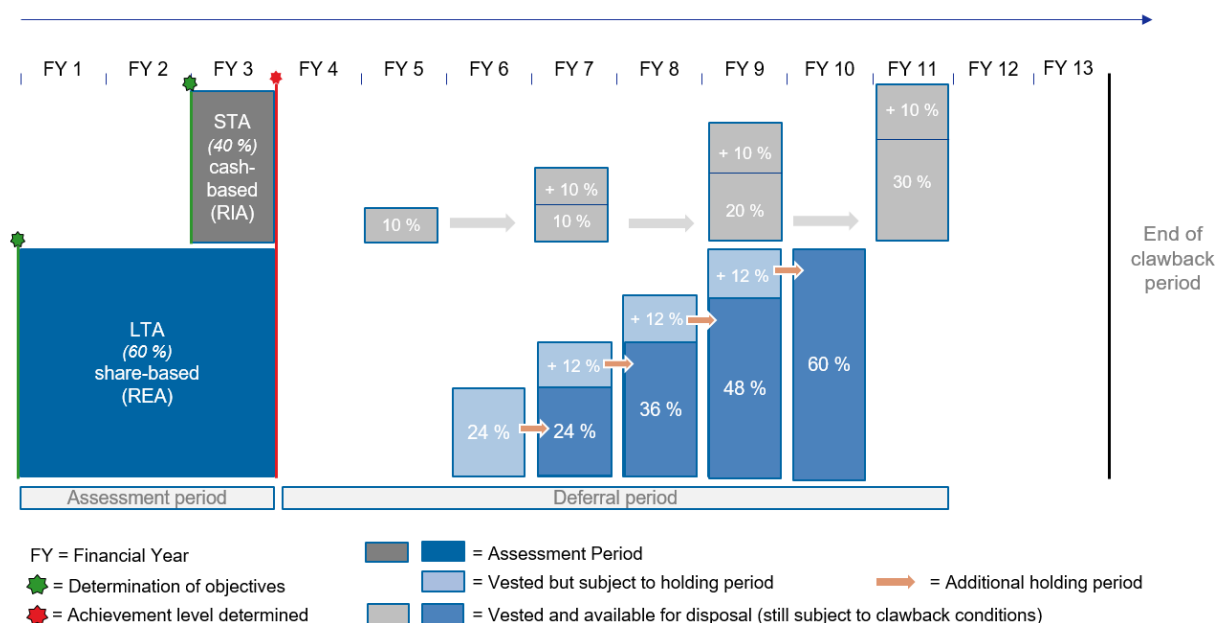
The Remuneration Ordinance for Institutions (InstitutsVergV) generally stipulates a three-year assessment period for the determination of the variable compensation for Management Board members. Deutsche Bank complies with this requirement by assessing each of the objectives of the Long-Term Award (LTA) over a three-year period. If the relevant three years cannot be attributed to a member of the Management Board because the member joined the Bank only recently, the achievement level for the objectives will be determined for the period that can be attributed to the member. The deferral period for the LTA is in principle five years. If the assessment period is shorter than the prescribed minimum, the deferral period of the variable compensation to be granted is extended by the number of years missing for the minimum assessment period. The Short-Term Award (STA) has an assessment period of one year. The deferral period for the STA is in principle seven years.

The Long-Term Award (LTA) is granted in the form of a share-based instrument (Restricted Equity Awards (REAs)). The disbursement takes place over a deferral period of 5 years in 4 tranches, beginning with a tranche of 40% in year 2 after the end of the performance period and 3 tranches of 20% in years 3, 4, and 5 after the end of the performance period. After the deferral period, the REAs of each tranche are also subject to an additional holding period of one year. Accordingly, the Management Board members cannot dispose of the shares underlying the REAs until after 3 years, at the earliest, and in full until after 6 years. During the deferral and holding periods, the value of the REAs is linked to the performance of the Deutsche Bank share and is therefore tied to the long-term performance of the Bank, and thereby strengthens the alignment of the Management Board members' incentives to Deutsche Bank's performance.

The Short-Term Award (STA) is generally granted in the form of deferred cash compensation (Restricted Incentive Awards - RIAs). The STA is paid out in four tranches of 25% each over a total period of seven years after 1, 3, 5 and 7 years following the end of the assessment period. However, if the STA accounts for more than 50% of the total variable compensation, the portion exceeding 50% is also granted in the form of Restricted Equity Awards (REAs). This ensures that at least 50% of the total variable compensation is always granted in a share-based form in accordance with the regulatory requirements. The portion exceeding 50% is subject to the same deferral rules as the share-based compensation from the LTA.

Instead of receiving Restricted Equity Awards (REAs) and Restricted Incentive Awards (RIAs) as described above, holders of specific functions at certain Deutsche Bank U.S. entities are required by applicable regulation to be compensated under different plans. Restricted compensation for these persons consists of restricted share awards and restricted cash awards. The recipient becomes the beneficial owner of the awards as of the Award Date and the awards are held on the recipient's behalf. These awards are restricted for a period of time (subject to the applicable plan rules and award statements, including performance conditions and forfeiture provisions). The restriction period is aligned to the retention periods applicable to Deutsche Bank's usual deferred awards. With regard to the Management Board members, these rules apply to Christiana Riley due to her role as CEO of Deutsche Bank USA Corp.

For the RIAs and REAs, specific forfeiture conditions apply during the deferral and holding periods (additional information is provided in the section "Backtesting, malus and clawback").



Backtesting, malus and clawback

By granting compensation components in a deferred form spread out over several years, a long-term incentive is created. In addition, the individual tranches are subject to specific forfeiture conditions until they vest.

The Supervisory Board regularly reviews whether the results achieved by the Management Board members in the past are sustainable (backtesting). If the outcome is that the achievements underlying the granting of the variable compensation were not sustainable, the awards may be partially or fully forfeited.

Also, if the Group's results are negative, previously granted variable compensation may be declared fully or partially forfeited during the deferral period. In addition, the awards may be fully or partially forfeited if specific solvency or liquidity conditions are not met. Furthermore, awards may be forfeited in whole or in part in the event of individual misconduct (including breaches of regulations), dismissal for cause or negative individual contributions to performance (malus).

In addition, the contracts of the Management Board members also enable the Supervisory Board to reclaim already paid or delivered compensation components due to certain individual negative performance contributions by the Management Board member (clawback) in accordance with the provisions pursuant to Sections 18 (5) and 20 (6) of the Remuneration Ordinance for Institutions (InstitutsVergV). The clawback is possible for the entire variable compensation for a financial year until the end of two years after the end of the deferral period of the last tranche of the compensation elements awarded on a deferred basis for the respective financial year.

The Supervisory Board regularly reviews in due time before the respective due dates the possibility of a full or partial forfeiture (malus) or reclaiming (clawback) of the Management Board members' variable compensation components. There was no forfeiture or clawback of awards in 2022.

Information on shares and fulfilling the share ownership obligation (Shareholding Guidelines)

All members of the Management Board are required to acquire a significant amount of Deutsche Bank shares and to hold them on a long-term basis. This requirement is meant to foster the identification of the Management Board members with Deutsche Bank and its shareholders and to ensure a long-term link to the development of the Deutsche Bank's business.

For the Chief Executive Officer, the number of shares to be held is equivalent to 200% of his annual gross base salary, and for the other Management Board members, 100% of their annual gross base salary. The requirements of the shareholding obligation must first be fulfilled as of the date on which the share-based variable compensation that has been granted to the Management Board member since his or her appointment to the Management Board (waiting period) in total corresponds to 1.33 times the shareholding obligation. Compliance with the requirements is reviewed semi-annually. If the required number of shares is not met, the Management Board members must correct any deficiencies by the next review.

In the context of granting variable compensation, the Supervisory Board can resolve on an individual basis that not only the Long-Term Award (LTA) but also parts of the Short-Term Award (STA) or the STA as a whole may be awarded in shares until the shareholding obligation is fulfilled. This is intended to ensure faster compliance with the shareholding obligation.

Members of the Management Board

The following table shows the number of outstanding share awards of the current Management Board members as of February 11, 2022 and February 10, 2023 as well as the number of share awards newly granted, delivered or forfeited in this period.

Members of the Management Board	Balance as of Feb 11, 2022	Granted	Delivered	Forfeited	Balance as of Feb 10, 2023
Christian Sewing	693,230	202,143	–	–	895,373
James von Moltke	564,465	153,123	–	–	717,588
Karl von Rohr	519,839	160,670	–	–	680,509
Fabrizio Campelli	338,899	149,265	32,994	–	455,170
Bernd Leukert	151,300	147,039	3,037	–	295,302
Alexander von zur Mühlen	278,282	145,900	46,275	–	377,906
Christiana Riley	248,345	147,092 ¹	102,810 ²	–	292,627 ³
Rebecca Short	92,754	106,028 ⁴	26,517	–	172,265
Professor Dr. Stefan Simon	149,373	145,979	29,574	–	265,778
Olivier Vigneron ⁵	–	–	–	–	130,539

¹ Under the underlying plan, the 147,092 restricted shares originally granted were taxed at the time of grant, with 74,278 shares remaining on an after-tax basis. We refer to the corresponding presentation in the chapter "Deferral and retention periods".

² Included are 72,814 share awards delivered to cover the amount of tax due under the underlying plan (see footnote 1).

³ Includes a net number of 74,278 share entitlements under the underlying plan (see footnote 1).

⁴ Includes 8,020 shares granted in 2022 for her pre-Board role.

⁵ Member since 20 May 2022.

The table below shows the total number of Deutsche Bank shares held by the incumbent Management Board members as of the reporting dates February 11, 2022, and February 10, 2023 as well as the number of share-based awards and the fulfillment level for the shareholding obligation.

as of February 10, 2023								
Members of the Management Board	Number of Deutsche Bank shares (in Units) as of Feb 11, 2022	Number of Deutsche Bank shares (in Units)	Restricted Equity Award(s)/ Outstanding Equity Units (deferred with retention period) (in Units)	thereof 75% of Restricted Equity Award(s)/ Outstanding Equity Units chargeable to share obligation (deferred with retention period) (in Units)	Total value of Deutsche Bank shares and Restricted Equity Award(s)/ Outstanding Equity Units chargeable to share obligation (in Units)	Share retention obligation must be fulfilled Yes / No	Level of required shareholding obligation (in Units) ¹	Fulfillment ratio (in %)
Christian Sewing	192,000	222,171	895,373	671,530	893,701	No	635,257	141%
James von Moltke	74,753	74,753	717,588	538,191	612,944	Yes	264,690	232%
Karl von Rohr	30,058	30,058	680,509	510,382	540,440	Yes	264,690	204%
Fabrizio Campelli	132,010	149,473	455,170	341,377	490,850	No	247,044	199%
Bernd Leukert	7,882	9,477	295,302	221,477	230,954	Yes	211,752	109%
Alexander von zur Mühlen	320,829	359,655	377,906	283,430	643,085	No	211,752	304%
Christiana Riley	82,504	100,620	292,627	219,470	320,090	Yes	211,752	151%
Rebecca Short	36,451	51,299	172,265	129,199	180,498	No	211,752	85%
Prof. Dr. Stefan Simon	0	0	265,778	199,334	199,334	No	211,752	94%
Olivier Vigneron ²	–	0	130,539	97,904	97,904	No	211,752	46%
Total	876,487	997,506	4,283,058	3,212,294	4,209,800			

¹ The calculation of the total value of the Deutsche Bank shares and share awards / outstanding shares eligible for the shareholding requirements is based on the share price € 11.338 (Xetra closing price on February 10, 2023).

² Member since May 20, 2022.

All Management Board members fulfilled the shareholding obligations in 2022 or are currently in the waiting period.

The Chairman of the Management Board, Mr. Sewing, voluntarily committed to invest 15% of his monthly net salary in Deutsche Bank shares from September 2019 until the end of December 2022. In each case, purchases take place on the 22nd day of each month or on the following trading day.

Benefits as of the end of the mandate

Benefits upon regular contract termination

The Supervisory Board allocates an entitlement to pension plan benefits to the Management Board members. These entitlements involve a pension plan with predefined contributions. Under this pension plan, a personal pension account is set up for each participating member of the Management Board with effect from the start of office as a Management Board member.

The members of the Management Board, including the Management Board Chairman, receive a uniform, contractually defined, fixed annual contribution amount of € 650,000. The contribution accrues interest that is credited in advance and determined by means of an age-related factor, up to the age of 60. For entitlements from a first-time or renewed appointment starting from the 2021 financial year, interest accrues at an average rate of 2% per annum, for legacy entitlements 4%. From the age of 61 onwards, an additional contribution equal to the amount resulting from applying the above interest rate to the balance of the pension account as of December 31 of the previous year will be credited to the pension account. The annual contributions, taken together, form the pension capital amount available to pay the future pension benefits upon the occurrence of a pension event (retirement age, disability or death). The pension account balance is vested from the start.

If a Management Board member is subject to non-German income tax, the granting of an annual pension cash allowance of € 650,000 may be selected as an alternative to the pension plan entitlement. This is subject to the precondition that receiving the customary pension plan contributions entails not insignificant tax-related disadvantages for the Management Board member compared to receiving a pension allowance. This option can be exercised once and from then on applies to the entire term of office of the Management Board member.

The following table shows the annual contributions, the interest credits, the account balances and the annual service costs for the years 2022 and 2021 as well as the corresponding defined benefit obligations for each member of the Management Board in office in 2022 as of December 31, 2021 and December 31, 2022. The different balances are attributable to the different lengths of service on the Management Board, the respective age-related factors, and the different contribution rates.

Members of the Management Board in €	Annual contribution, in the year		Interest credit, in the year		Account balance, end of year		Service cost (IFRS), in the year		Present value of the defined benefit obligation (IFRS), end of year	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Christian Sewing	760,500	773,500	0	0	7,276,500	6,516,000	529,109	701,494	5,422,875	6,263,328
James von Moltke	845,000	871,000	0	0	5,034,250	4,189,250	638,068	820,820	3,945,284	4,095,605
Karl von Rohr	728,000	754,000	0	0	5,449,001	4,721,001	652,035	772,131	4,864,821	4,866,754
Fabrizio Campelli	946,836	1,007,500	0	0	3,181,754	2,234,918	605,376	906,767	2,148,218	2,091,609
Bernd Leukert	786,500	812,500	0	0	2,734,334	1,947,834	637,939	785,526	2,317,651	1,957,432
Alexander von zur Mühlen ¹	0	0	0	0	0	0	0	0	0	0
Christiana Riley ¹	0	0	0	0	0	0	0	0	0	0
Rebecca Short	819,000	554,668	0	0	1,373,668	554,668	475,091	476,303	826,548	496,829
Prof. Dr. Stefan Simon	845,000	871,000	0	0	3,009,501	2,164,501	629,482	824,015	2,311,957	2,128,664
Olivier Vigneron ²	644,584	0	0	0	644,584	0	423,955	0	446,932	0
Stuart Lewis ³	303,335	754,000	0	0	6,715,273	6,411,938	258,440	756,618	6,115,579	6,919,079

¹ The Management Board member receives a pension allowance, which is shown in the chapter "Compensation granted and owed (inflow table)".

² Member since May 20, 2022

³ Member until May 19, 2022

Benefits upon early termination

The Management Board members are in principle entitled to receive a severance payment upon an early termination of their appointment, provided the Bank is not entitled to revoke the appointment or give notice under the contractual agreement for cause. In accordance with the recommendation of the German Corporate Governance Code, the severance payment amounts to up to a maximum of two times the annual compensation at the maximum and must not exceed the amount that would be payable as compensation for the remaining term of the service contract. The calculation of the severance payment is based on the annual compensation for the previous financial year and, if applicable, on the expected annual compensation for the current financial year. The severance payment is determined and granted in accordance with the statutory and regulatory requirements, in particular with the provisions of the Remuneration Ordinance for Institutions (InstitutsVergV).

In the event of a change of control, Management Board members have a special right to termination of their service contract. However, in such case, there is no entitlement to a severance payment.

Other service contract provisions

Term of the service contract

The term of the Management Board service contracts is linked to the duration of the appointment and is a maximum of five years in accordance with Section 84 of the German Stock Corporation Act. The Supervisory Board shall decide at an early stage, no later than six months before the expiry of the appointment period, on a renewed appointment. In the case of the Management Board member's reappointment, the service contract is extended for the duration of a renewed appointment.

For first-time appointments, a contract term of three years is not to be exceeded. The Management Board service contract ends automatically with the expiry of the appointment period without requiring the express notice of termination.

Reduction of base salary regarding compensation from other mandates

The service contracts of the Management Board members contain an obligation of the members to ensure that they will not receive any compensation to which they would otherwise be entitled in their capacity as a member of any corporate body, in particular a supervisory board, advisory board or similar body of any group entity of the Bank pursuant to Section 18 of the German Stock Corporation Act. Accordingly, Management Board members do not receive any compensation for mandates on boards of Deutsche Bank subsidiaries.

A Management Board member's base salary will be reduced in an amount equal to 50% of the compensation from a mandate – in particular supervisory board or advisory board mandates – at a company that does not belong to Deutsche Bank Group. There is no such deduction of any compensation that does not exceed € 100,000 per mandate and calendar year.

In the 2022 financial year, the base salary of one member of the Management Board was reduced by the amount of the compensation from one mandate at a company that does not belong to Deutsche Bank Group, since the compensation exceeded the threshold amount.

Post-contractual non-compete clause

After leaving the Management Board, the members are as a general rule subject to a one-year non-compete clause. During the non-compete period, Deutsche Bank pays the Management Board member compensation (waiting allowance "Karenzentschädigung") amounting to 65% of his or her annual base salary. The waiting allowance shall be credited against any claim for severance pay. In addition, the waiting allowance will be reduced by any income that the Management Board member earns during the non-compete period from self-employed, salaried or other paid activities that are not subject to the non-compete clause. Deutsche Bank may waive a Management Board member's compliance with the post-contractual non-compete clause. From the date of the waiver, if and when such waiver is granted, Deutsche Bank's obligation to pay the waiting allowance ("Karenzentschädigung") ends.

Stuart Lewis left the Management Board with effect of the end of May 19th, 2022. The Service Contract was terminated amicably with effect as of the end of the May 31st, 2022. As foreseen and in line with his service contract, compensation for a post-contractual non-compete clause ("Karenzentschädigung") in the amount of € 1,820,000 corresponding to 65% of his fixed base salary p.a. was agreed. The post-contractual non-compete clause applies from June 1st, 2022 until May 31st, 2023 in the scope set forth of the Service Contract.

Deviations from the compensation system

There were no deviations from the compensation system in the 2022 financial year.

Management Board compensation 2022

Current Management Board members

Total compensation 2022

The Supervisory Board determined the aforementioned compensation on an individual basis for 2022 and 2021 as follows:

	2022					2021	
in €	Base salary ¹	Short Term Award	Long Term Award	Total compensation	Target Total compensation	Ratio to Target	Total compensation
Christian Sewing	3,600,000	2,754,810	2,578,932	8,933,742	9,000,000	99%	8,812,448
James von Moltke	2,900,000	2,120,115	2,053,594	7,073,709	7,200,000	98%	6,748,426
Karl von Rohr	3,000,000	2,165,240	2,101,352	7,266,592	7,400,000	98%	7,143,047
Fabrizio Campelli	2,466,667	2,053,188	1,966,038	6,485,893	6,583,334	99%	6,248,949
Bernd Leukert	2,400,000	1,908,550	1,958,078	6,266,628	6,500,000	96%	6,191,549
Alexander von zur Mühlen	2,400,000	1,891,023	1,958,078	6,249,101	6,500,000	96%	6,162,166
Christiana Riley	2,400,000	1,803,385	1,958,078	6,161,463	6,500,000	95%	6,192,916
Rebecca Short	2,400,000	1,966,975	1,958,078	6,325,053	6,500,000	97%	4,127,244
Professor Dr. Stefan Simon	2,400,000	1,900,760	1,958,078	6,258,838	6,500,000	96%	6,164,216
Olivier Vigneron ²	1,473,333	1,064,039	1,303,173	3,840,545	3,990,278	96%	–
Stuart Lewis ³	1,166,667	798,000	835,765	2,800,432	2,916,667	96%	6,728,126
Total	26,606,667	20,426,085	20,629,244	67,661,996	69,590,279	97%	64,519,087

¹ In the column "Basic salary", the target values set by the Supervisory Board are shown in EUR for reasons of comparability. The actual inflow differs from this target value for Management Board members Alexander von zur Mühlen and Christiana Riley due to currency fluctuations and for Bernd Leukert due to the offsetting of compensation from mandates. The inflow is shown in the chapter "Compensation granted and owed (inflow table)".

² Member since May 20, 2022.

³ Member until May 19, 2022. Pro-rata to the duration of the service contract until 31 May 2022.

The number of share awards granted to the members of the Management Board in the form of Restricted Equity Awards (REA) in 2023 for the 2022 financial year was calculated by dividing the respective amounts in euro by the higher of either the average Xetra closing price of the Deutsche Bank share during the last ten trading days in February 2023 or the Xetra closing price on February 28, 2023 (€ 11.800).

	Restricted Equity Award(s) (deferred with additional retention period) (in Units) ¹
Members of the Management Board	
Christian Sewing	226,006
James von Moltke	176,852
Karl von Rohr	180,788
Fabrizio Campelli	170,306
Bernd Leukert	165,939
Alexander von zur Mühlen	165,939
Christiana Riley	165,939
Rebecca Short	166,316
Prof. Dr. Stefan Simon	165,939
Olivier Vigneron ²	110,438
Stuart Lewis ³	70,828
Total	1,765,289

¹ The Restricted Equity Awards are commercially rounded for presentation purposes.

² Member since May 20, 2022.

³ Member until May 19, 2022

Granted and owed compensation (inflow table)

The following table shows the compensation paid and owed in the 2022 and 2021 financial years to incumbent members of the Management Board in the 2021 financial year, pursuant to Section 162 (1) sentence 1 of the German Stock Corporation Act. This involves the compensation components that were either actually paid or delivered to the individual Management Board members within the reporting period ("paid") or were already legally due during the reporting period but not yet delivered ("owed").

Besides the compensation amounts, the table additionally shows the relative proportions of fixed and variable compensation within the total compensation pursuant to Section 162 (1) sentence 2 of the German Stock Corporation Act.

	Christian Sewing				James von Moltke			
	2022		2021		2022		2021	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Fixed compensation components:								
Base salary	3,600	82%	3,600	93%	2,900 ²	77%	2,800	70%
Pension allowance	0	0%	0	0%	0	0%	0	0%
Fringe benefits	216	5%	(8.0) ¹	0%	84	2%	52	1%
Total fixed compensation	3,816	87%	3,592	93%	2,984	79%	2,852	71%
Variable compensation components:								
Deferred variable compensation								
thereof Restricted Incentive Awards:								
2017 Restricted Incentive Award: Buyout	0	0%	0	0%	0	0%	140	3%
2017 Restricted Incentive Award: Sign On	0	0%	0	0%	67	2%	67	2%
2019 Restricted Incentive Award for 2018	232	5%	232	6%	169	4%	169	4%
2020 Restricted Incentive Award for 2019	43	1%	43	1%	43	1%	43	1%
2021 Restricted Incentive Award for 2020	304	7%	0	0%	213	6%	0	0%
thereof Equity Awards:								
2017 Restricted Equity Award: Buyout	0	0%	0	0%	0	0%	124	3%
2015 DB Equity Plan for 2014	0	0%	0	0%	0	0%	0	0%
Fringe benefits	0	0%	0	0%	308 ³	8%	616 ³	15%
Total variable compensation	579	13%	275	7%	799	21%	1,157	29%
Total compensation	4,394	100%	3,867	100%	3,783	100%	4,009	100%

¹ Due to the economic participation in the costs of a company car provided, which exceeds the amount of the other fringe benefits, a negative balance is to be shown for the financial year 2021.

² For further details on compensation decision, please refer to chapter "Management Board Changes and Compensation Decisions in 2022" in this report.

³ The variable fringe benefits represent a housing allowance which was granted until June 30, 2022.

	Karl von Rohr				Fabrizio Campelli			
	2022		2021		2022		2021	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Fixed compensation components:								
Base salary	3,000	87%	3,000	93%	2,467 ¹	90%	2,400	99%
Pension allowance	0	0%	0	0%	0	0%	0	0%
Fringe benefits	8	0%	24	1%	57	2%	12	0%
Total fixed compensation	3,008	87%	3,024	93%	2,524	92%	2,412	100%
Variable compensation components:								
Deferred variable compensation								
thereof Restricted Incentive Awards:								
2017 Restricted Incentive Award: Buyout	0	0%	0	0%	0	0%	0	0%
2017 Restricted Incentive Award: Sign On	0	0%	0	0%	0	0%	0	0%
2019 Restricted Incentive Award for 2018	169	5%	169	5%	0	0%	0	0%
2020 Restricted Incentive Award for 2019	43	1%	43	1%	7	0%	7	0%
2021 Restricted Incentive Award for 2020	224	5%	0	0%	213	6%	0	0%
thereof Equity Awards:								
2017 Restricted Equity Award: Buyout	0	0%	0	0%	0	0%	0	0%
2015 DB Equity Plan for 2014	0	0%	0	0%	0	0%	0	0%
Fringe benefits	0	0%	0	0%	0	0%	0	0%
Total variable compensation	435	13%	211	7%	220	8%	7	0%
Total compensation	3,444	100%	3,235	100%	2,744	100%	2,420	100%

¹ For further details on compensation decision, please refer to chapter "Management Board Changes and Compensation Decisions in 2022" in this report.

	Bernd Leukert				Alexander von zur Mühlen			
	2022		2021		2022		2021	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Fixed compensation components:								
Base salary	2,397 ¹	92%	2,394 ¹	99%	2,567 ²	75%	2,345 ²	74%
Pension allowance	0	0%	0	0%	650	19%	650	21%
Fringe benefits	8	0%	25	1%	121	4%	64	2%
Total fixed compensation	2,404	93%	2,419	100%	3,338	98%	3,059	97%
Variable compensation components:								
Deferred variable compensation								
thereof Restricted Incentive Awards:								
2017 Restricted Incentive Award: Buyout	0	0%	0	0%	0	0%	0	0%
2017 Restricted Incentive Award: Sign On	0	0%	0	0%	0	0%	0	0%
2019 Restricted Incentive Award for 2018	0	0%	0	0%	0	0%	0	0%
2020 Restricted Incentive Award for 2019	0	0%	0	0%	0	0%	0	0%
2021 Restricted Incentive Award for 2020	188	4%	0	0%	74	2%	0	0%
thereof Equity Awards:								
2017 Restricted Equity Award: Buyout	0	0%	0	0%	0	0%	0	0%
2015 DB Equity Plan for 2014	0	0%	0	0%	0	0%	0	0%
Fringe benefits	0	0%	0	0%	0	0%	98	3%
Total variable compensation	188	7%	0	0%	74	2%	98	3%
Total compensation	2,593	100%	2,419	100%	3,412	100%	3,157	100%

¹ The fixed compensation shown includes the crediting of compensation from mandates.

² As the fixed compensation is granted in local currency, it is subject to FX-rate changes.

	Christiana Riley				Rebecca Short			
	2022		2021		2022		2021	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Fixed compensation components:								
Base salary	2,612 ¹	72%	2,328 ¹	76%	2,400	99%	1,600	100%
Pension allowance	650	18%	650	21%	0	0%	-	0%
Fringe benefits	204	6%	85	3%	36	1%	6	0%
Total fixed compensation	3,466	95%	3,063	99%	2,436	100%	1,606	100%
Variable compensation components:								
Deferred variable compensation								
thereof Restricted Incentive Awards:								
2017 Restricted Incentive Award: Buyout	0	0%	0	0%	0	0%	0	0%
2017 Restricted Incentive Award: Sign On	0	0%	0	0%	0	0%	0	0%
2019 Restricted Incentive Award for 2018	0	0%	0	0%	0	0%	0	0%
2020 Restricted Incentive Award for 2019	0	0%	0	0%	0	0%	0	0%
2021 Restricted Incentive Award for 2020	186	4%	0	0%	0	0%	0	0%
thereof Equity Awards:								
2017 Restricted Equity Award: Buyout	0	0%	0	0%	0	0%	0	0%
2015 DB Equity Plan for 2014	0	0%	0	0%	0	0%	0	0%
Fringe benefits	1	0%	17	1%	0	0%	0	0%
Total variable compensation	187	5%	17	1%	0	0%	0	0%
Total compensation	3,653	100%	3,079	100%	2,436	100%	1,606	100%

¹ As the fixed compensation is granted in local currency, it is subject to FX-rate changes.

	Professor Dr. Stefan Simon				Olivier Vigneron (Member since May 20, 2022)			
	2022		2021		2022		2021	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Fixed compensation components:								
Base salary	2,400	96%	2,400	98%	1,473	98%	-	-
Pension allowance	0	0%	0	0%	0	0%	-	-
Fringe benefits	10	0%	46	2%	35	2%	-	-
Total fixed compensation	2,410	97%	2,446	100%	1,508	100%	-	-
Variable compensation components:								
Deferred variable compensation								
thereof Restricted Incentive Awards:								
2017 Restricted Incentive Award: Buyout	0	0%	0	0%	0	0%	-	-
2017 Restricted Incentive Award: Sign On	0	0%	0	0%	0	0%	-	-
2019 Restricted Incentive Award for 2018	0	0%	0	0%	0	0%	-	-
2020 Restricted Incentive Award for 2019	0	0%	0	0%	0	0%	-	-
2021 Restricted Incentive Award for 2020	78	2%	0	0%	0	0%	-	-
thereof Equity Awards:								
2017 Restricted Equity Award: Buyout	0	0%	0	0%	0	0%	-	-
2015 DB Equity Plan for 2014	0	0%	0	0%	0	0%	-	-
Fringe benefits	0	0%	0	0%	0	0%	-	-
Total variable compensation	78	3%	0	0%	0	0%	-	-
Total compensation	2,488	100%	2,446	100%	1,508	100%	-	-

	Stuart Lewis (Member until May 19, 2022)			
	2022		2021	
	in € t.	in %	in € t.	in %
Fixed compensation components:				
Base salary	1,167	44%	2,800	91%
Non-compete payment	1,062	40%	0	0%
Pension allowance	0	0%	0	0%
Fringe benefits	32	1%	80	3%
Total fixed compensation	2,260	85%	2,880	94%
Variable compensation components:				
Deferred variable compensation				
thereof Restricted Incentive Awards:				
2017 Restricted Incentive Award: Buyout	0	0%	0	0%
2017 Restricted Incentive Award: Sign On	0	0%	0	0%
2019 Restricted Incentive Award for 2018	156	6%	156	5%
2020 Restricted Incentive Award for 2019	43	2%	43	1%
2021 Restricted Incentive Award for 2020	188	4%	0	0%
thereof Equity Awards:				
2017 Restricted Equity Award: Buyout	0	0%	0	0%
2015 DB Equity Plan for 2014	0	0%	0	0%
Fringe benefits	0	0%	0	0%
Total variable compensation	387	15%	199	6%
Total compensation	2,648	100%	3,079	100%

With respect to the deferred compensation components of previous years approved in the reporting year, the Supervisory Board confirmed that the respective performance conditions were met.

Former members of the Management Board

Granted and owed compensation (inflow table)

The following table shows the compensation paid and owed to the former members of the Management Board in the 2022 financial year pursuant to Section 162 (1) sentence 1 of the German Stock Corporation Act. This involves the compensation components that were either actually delivered to the former Management Board members within the reporting period ("paid") or were already legally due during the reporting period but not yet delivered ("owed"). Pursuant to Section 162 (5) of the German Stock Corporation Act, no personal data is provided on former members of the Management Board who ended their work for the Management Board before December 31, 2012.

	Frank Kuhnke Member until April 30, 2021		Werner Steinmüller Member until July 31, 2020		Sylvie Matherat Member until July 31, 2019		Garth Ritchie Member until July 31, 2019	
	2022		2022		2022		2022	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Non-Compete payment	520	32%	0	0%	0	0%	0	0%
Deferred variable compensation								
Restricted Incentive Awards	212	13%	283	100%	132	99%	268	100%
Equity Awards	894	55%	0	0%	0	0%	0	0%
Fringe benefits	0	0%	0	0%	2	1%	0	0%
Pension benefits	0	0%	0	0%	0	0%	0	0%
Total compensation	1,626	100%	283	100%	134	100%	268	100%

	Nicolas Moreau Member until Dec 31, 2018			
	2022			
	DB AG	DWS Management GmbH	Overall	
	in € t.	in € t.	in € t.	in %
Deferred variable compensation				
Restricted Incentive Awards	79	90	169	53%
Equity Awards ¹	0	126	126	40%
Fringe benefits	21	0	21	7%
Pension benefits	0	0	0	0%
Total compensation	101	216	317	100%

¹ The equity awards shown are share-based instruments granted by DWS Management GmbH. Details of these instruments can be found in the DWS Annual Report.

	Frank Strauß Member until July 31, 2019		Kimberly Hammonds ¹ Member until May 24, 2018		Dr. Marcus Schenck Member until May 24, 2018		John Cryan Member until April 8, 2018	
	2022		2022		2022		2022	
	in € t.	in %	in € t.	in %	in € t.	in %	in € t.	in %
Deferred variable compensation								
Restricted Incentive Awards	326	100%	52	73%	65	100%	47	100%
Equity Awards	0	0%	20	28%	0	0%	0	0%
Fringe benefits	0	0%	0	0%	0	0%	0	0%
Pension benefits	0	0%	0	0%	0	0%	0	0%
Total compensation	326	100%	71	100%	65	100%	47	100%

¹ Kimberly Hammonds passed away in 2022, therefore there will be no disclosure within the table "Granted and owed" from the Compensation Report 2023 and onwards.

	Hermann-Josef Lamberti Member until May 31, 2012		Josef Ackermann Member until May 31, 2012	
	2022		2022	
	in € t.	in %	in € t.	in %
Deferred variable compensation				
Restricted Incentive Awards	0	0%	0	0%
Equity Awards	0	0%	0	0%
Fringe benefits	0	0%	0	0%
Pension benefits	1,492	100%	959	100%
Total compensation	1,492	100%	959	100%

Outlook for the 2023 financial year

Total target compensation and maximum compensation

The total target compensation for 2023 will in principle remain unchanged compared to the total target compensation in force or adjusted in 2022.

The limits on compensation for the members of the Management Board remain unchanged versus the 2022 financial year. This means that the maximum possible achievement level for variable compensation amounts to 150%, and there is a cap at € 9.85 million that limits the sum of base salary, STA and LTA. In addition, in accordance with Section 87a (1) sentence 2 No. 1 of the German Stock Corporation Act (AktG), the limit set for total compensation is maintained unchanged at € 12 million uniformly for all members of the Management board as the maximum cap based on the financial year.

2023 objective structure and targets

The current compensation system works well and produces the right results. However, the system is perceived as very complex. For this reason, the Compensation Control Committee discussed in several meetings options to simplify the compensation structures without substantially changing the system itself. Therefore, the objective structure will continue to be in line with the compensation system approved by the General Meeting in 2021. However, appropriate adjustments were made in order to reduce the overall complexity of the system from the 2023 financial year onwards.

Short-Term Award (STA)

Generally unchanged from 2022, the amount of the Short-Term Award (STA) for the 2023 financial year will continue to be 40% of the total target variable compensation and is based on the individual achievement level of the short and medium-term individual as well as divisional objectives.

In 2022, the Short-Term Award consisted of three compensation components. From 2023 on the component "annual priorities" will be eliminated as a separate compensation component and its two objectives will be allocated to the remaining two components. The non-financial objective with a weighting to 5% is allocated to the "Individual Objectives" component and the financial objective with a weighting of 5% will be allocated to the "Balanced Scorecard" component.

From 2023, the STA components are:

- Individual objectives (25%): 3 to 4 individual or divisional objectives and one additional non-financial "behavior objective"
- Balanced Scorecards (15%): Individual and divisional/regional dashboards and Key Deliverables

The specific objectives of the Short-Term Award for 2023 will be disclosed retrospectively in the 2023 Compensation Report.

Long-Term Award (LTA)

The Long-Term Award (LTA) will continue to be 60% of the total target variable compensation and consists of collective long-term objectives linked to the Bank's strategy.

In 2022, the Long-Term Award consisted of four compensation components. The components "ESG" and "Relative Total Shareholder Return" remain with unchanged weightings in 2023. The components "Organic Capital Growth" and "Group Component" will be combined into "Group Financials" weighting 25%; since the Organic Capital Growth and RoTE accurately reflect the capital increase, the Organic Capital Growth is removed as a separate objective.

From 2023, the LTA components are:

- ESG Component (20%)
- Relative Total Shareholder Return (15%)
- Group Financials (CET1, RoTE and CIR) (25%)

On balance, these changes are improvements which simplify the compensation structure. They increase the emphasis on individual goals while preserving the consistency of the overall structure.

ESG

In order to constantly align our compensation system with our sustainability strategy, the ESG Component including its assessment and evaluation criteria, has been revised and adjusted with a clear focus on the reduction of greenhouse gas emissions, regarding our own operations and furthermore, guiding our clients on their path to net zero. The remaining KPIs are kept unchanged to enable a long-term comparison and consistent assessment measurement.

The objectives of the ESG for the financial year 2023 are the following:

ESG			Lower Limit (0%)	Target (100%)	Upper Limit (150%)	2023 Relative weight
Environ- ment	Sustainable Finance	Increase in business with sustainable financing and investments ¹	€ 265 bn	€ 315 bn	€ 365 bn	12.5%
		Drive climate risk management – Publicly disclose detailed Net Zero Transition plan and set reduction targets for further carbon intense industry sectors by year end 2023 to align with NZBA commitment	Completi n of target setting for 2 or less relevant key sectors.	Completi n of target setting for 4 relevant key sectors.	Completi n of target setting for further 8 (all) NZBA recommen ded relevant key sectors	12.5%
	Own Operations	Total building/ energy consumption (kwh/squaremeter) vs. YE 2019	-17%	-21%	-23%	5%
Social		Employee Feedback Culture (latest survey result)	72%	75%	78%	5%
		Gender Diversity (VP/D/MD)	31%	31.8%	32.3%	10%
Governance		Control Risk Management Grade (Assessment & Group Audit Risk/Control Culture Grade) – annual average	1.5	3	5	15%
		AML / KYC Remediation Activities	0%	100%	150%	40%
						100%

¹ The target value is an increase of € 100 billion compared to the previous year, based on a cumulative total volume of € 215 billion at the end of 2022.

The targets for the Relative Total Shareholder Return in relation to the average share returns of a selected peer group remain unchanged in 2023.

The “Financial Group Objectives” component contains important financial indicators, which are communicated as the Bank’s strategic objectives and constitute appropriate control instruments for the Bank. For 2023, these targets are the “Core capital ratio (CET1 ratio)”, the “Return on tangible equity (RoTE)” and the “cost/income ratio (CIR)”. In 2022, all three targets were already part of the Group Component.

Compensation of members of the Supervisory Board

Supervisory Board compensation is regulated in Section 14 of the Articles of Association, which can be amended by the General Meeting if necessary. The compensation provisions redesigned in 2013 were last amended by resolution of the General Meeting on May 19, 2022, and became effective on July 20, 2022. Accordingly, the following provisions apply:

The members of the Supervisory Board receive fixed annual compensation ("Supervisory Board Compensation"). The annual base compensation amounts to € 100,000 for each Supervisory Board member. The Supervisory Board Chairman receives twice that amount and the Deputy Chairpersons one and a half times that amount.

Members and chairs of the committees of the Supervisory Board are paid additional fixed annual compensation as follows:

Committee in €	Dec 31, 2022	
	Chair	Member
Audit Committee	200,000	100,000
Risk Committee	200,000	100,000
Nomination Committee	100,000	50,000
Mediation Committee	0	0
Regulatory Oversight Committee ¹	200,000	100,000
Chairman's Committee	100,000	50,000
Compensation Control Committee	100,000	50,000
Strategy and Sustainability Committee ¹	100,000	50,000
Technology, Data and Innovation Committee	200,000	100,000

¹ On 28 July 2022, the Supervisory Board resolved that the Integrity Committee is renamed as the Regulatory Oversight Committee in order to make the focal point of its tasks more clear externally. For the same reason, the Supervisory Board resolved on 15 December 2022 that the Strategy Committee is renamed as the Strategy and Sustainability Committee.

75 % of the compensation determined is disbursed to each Supervisory Board member after submitting invoices within the first three month of the following year. The other 25 % is converted by the company at the same time into company shares based on the average closing price on the Frankfurt Stock Exchange (Xetra or successor system) during the last ten trading days of the preceding January, calculated to three digits after the decimal point. The share value of this number of shares is paid to the respective Supervisory Board member in February of the year following his departure from the Supervisory Board or the expiration of his term of office, based on the average closing price on the Frankfurt Stock Exchange (Xetra or successor system) during the last ten trading days of the preceding January, provided that the member does not leave the Supervisory Board due to important cause which would have justified dismissal (forfeiture regulation).

In case of a change in Supervisory Board membership during the year, compensation for the financial year will be paid on a pro rata basis, rounded up/down to full months. For the year of departure, the entire compensation is paid in cash; a forfeiture regulation applies to 25 % of the compensation for that financial year.

The company reimburses the Supervisory Board members for the cash expenses they incur in the performance of their office, including any value added tax (VAT) on their compensation and reimbursements of expenses. Furthermore, any employer contributions to social security schemes that may be applicable under foreign law to the performance of their Supervisory Board work shall be paid for each Supervisory Board member affected. Finally, the Supervisory Board Chairman will be reimbursed appropriately for travel expenses incurred in performing representative tasks due to his function and reimbursed for costs for the security measures required based on his function.

In the interest of the company, the members of the Supervisory Board will be included in an appropriate amount in any financial liability insurance policy held by the company. The premiums for this are paid by the company.

Supervisory Board Compensation for the 2022 and 2021 financial years

Individual members of the Supervisory Board received the following compensation for the 2022 and 2021 financial years (excluding value added tax). The following two tables show the compensation paid and owed to the members of the Supervisory Board in the 2022 and 2021 financial years pursuant to Section 162 (1) sentence 1 of the German Stock Corporation Act (AktG).

Members of the Supervisory Board	Compensation for fiscal year 2022						
	Base salary		Compensation for Committees ¹		Total Compensation	Thereof payable in 1st quarter 2023	
	in €	in %	in €	in %	in €	in €	in %
Alexander Wynaendts ²	116,667	24%	379,167	76%	495,833	371,875	75%
Dr. Paul Achleitner ³	83,333	22%	291,667	78%	375,000	375,000	100%
Detlef Polaschek	150,000	33%	300,000	67%	450,000	337,500	75%
Ludwig Blomeyer-Bartenstein	100,000	33%	200,000	67%	300,000	225,000	75%
Mayree Clark	100,000	23%	329,167	77%	429,167	321,875	75%
Jan Duscheck	100,000	33%	200,000	67%	300,000	225,000	75%
Manja Eifert ⁴	75,000	64%	41,667	36%	116,667	87,500	75%
Dr. Gerhard Eschelbeck ³	41,667	40%	62,500	60%	104,167	104,167	100%
Sigmar Gabriel	100,000	50%	100,000	50%	200,000	150,000	75%
Timo Heider	100,000	32%	208,333	68%	308,333	231,250	75%
Martina Klee	100,000	50%	100,000	50%	200,000	150,000	75%
Henriette Mark ⁵	25,000	40%	37,500	60%	62,500	62,500	100%
Gabriele Platscher	100,000	33%	200,000	67%	300,000	225,000	75%
Bernd Rose	100,000	29%	250,000	71%	350,000	262,500	75%
Yngve Slyngstad ²	58,333	58%	41,667	42%	100,000	75,000	75%
John Alexander Thain	100,000	50%	100,000	50%	200,000	150,000	75%
Michele Trogni	100,000	22%	350,000	78%	450,000	337,500	75%
Dr. Dagmar Valcárcel	100,000	22%	350,000	78%	450,000	337,500	75%
Stefan Viertel	100,000	31%	220,833	69%	320,833	240,625	75%
Dr. Theodor Weimer	100,000	50%	100,000	50%	200,000	150,000	75%
Frank Werneke	100,000	33%	200,000	67%	300,000	225,000	75%
Prof. Dr. Norbert Winkeljohann	120,833	23%	400,000	77%	520,833	390,625	75%
Frank Witter	100,000	33%	200,000	67%	300,000	225,000	75%
Total	2,170,833	32%	4,662,500	68%	6,833,333	5,260,417	77%

¹ The respective memberships of the Supervisory Board committees in the 2022 financial year are presented in the section Committees of the Supervisory Board.

² Member of the Supervisory Board since May 19, 2022.

³ Member of the Supervisory Board until May 19, 2022.

⁴ Member of the Supervisory Board since April 7, 2022.

⁵ Member of the Supervisory Board until March 31, 2022.

Members of the Supervisory Board	Compensation for fiscal year 2021						
	Base salary		Compensation for Committees ¹		Total Compensation	Thereof paid in 1st quarter 2022	
	in €	in %	in €	in %	in €	in €	in %
Dr. Paul Achleitner	200,000	23%	670,833	77%	870,833	653,125	75%
Detlef Polaschek	150,000	33%	300,000	67%	450,000	337,500	75%
Ludwig Blomeyer-Bartenstein	100,000	33%	200,000	67%	300,000	225,000	75%
Frank Bsirske ²	83,333	33%	166,667	67%	250,000	250,000	100%
Mayree Clark	100,000	22%	350,000	78%	450,000	337,500	75%
Jan Duscheck	100,000	37%	170,833	63%	270,833	203,125	75%
Dr. Gerhard Eschelbeck	100,000	46%	116,667	54%	216,667	162,500	75%
Sigmar Gabriel	100,000	50%	100,000	50%	200,000	150,000	75%
Timo Heider	100,000	34%	191,667	66%	291,667	218,750	75%
Martina Klee	100,000	59%	70,833	41%	170,833	128,125	75%
Henriette Mark	100,000	40%	150,000	60%	250,000	187,500	75%
Gabriele Platscher	100,000	33%	200,000	67%	300,000	225,000	75%
Bernd Rose	100,000	31%	220,833	69%	320,833	240,625	75%
Gerd Alexander Schütz ³	41,667	83%	8,333	17%	50,000	50,000	100%
John Alexander Thain	100,000	50%	100,000	50%	200,000	150,000	75%
Michele Trogni	100,000	26%	291,667	74%	391,667	293,750	75%
Dr. Dagmar Valcárcel	100,000	22%	350,000	78%	450,000	337,500	75%
Stefan Viertel	100,000	41%	141,667	59%	241,667	181,250	75%
Dr. Theodor Weimer	100,000	50%	100,000	50%	200,000	150,000	75%
Frank Werneke ⁴	8,333	100%	0	0%	8,333	6,250	75%
Prof. Dr. Norbert Winkeljohann	100,000	20%	395,833	80%	495,833	371,875	75%
Frank Witter ⁵	58,333	41%	83,333	59%	141,667	106,250	75%
Total	2,141,666	33%	4,379,166	67%	6,520,833	4,965,625	76%

¹ The respective memberships of the Supervisory Board committees in the 2021 financial year are presented in the Annual Report 2021 on page 429.

² Member of the Supervisory Board until October 27, 2021.

³ Member of the Supervisory Board until May 27, 2021.

⁴ Member of the Supervisory Board since November 25, 2021.

⁵ Member of the Supervisory Board since May 27, 2021.

Following the submission of invoices 25 % of the compensation determined for each Supervisory Board member for the 2022 financial year was converted into notional shares of the company on the basis of a share price of € 12.0496 (average closing price on the Frankfurt Stock Exchange (Xetra) during the last ten trading days of January 2023). Members who left the Supervisory Board in 2022 were paid the entire amount of compensation in cash.

The following table shows the number of notional shares of the Supervisory Board members, to three digits after the decimal point, that were awarded in the first three months 2023 as part of their 2022 compensation, and the change versus the prior year, the number of notional shares accrued from previous years as part of the compensation, the total number of notional shares accumulated during the respective periods of membership in the Supervisory Board, and the change versus the prior year, as well as the total amounts paid out in February 2023 for members that left the Supervisory Board.

Number of notional shares						
	Converted in February 2023 as part of the compensation 2022	Change compared to previous year in %	Total number accrued during the current term of office	Total (cumulative)	Change compared to previous year in %	In February 2023 payable in €¹
Members of the Supervisory Board						
Alexander Wynaendts²	10,287.340	N/A	0	10,287.340	N/A	0
Dr. Paul Achleitner³	0	N/A	104,444.785	104,444.785	0%	1,258,518
Detlef Polaschek	9,336.410	-4%	44,909.808	54,246.218	21%	0
Ludwig Blomeyer-Bartenstein	6,224.273	-4%	29,939.872	36,164.145	21%	0
Mayree Clark	8,904.168	-8%	39,849.378	48,753.546	22%	0
Jan Duscheck	6,224.273	7%	25,398.115	31,622.388	25%	0
Manja Eifert⁴	2,420.551	N/A	0	2,420.551	N/A	0
Dr. Gerhard Eschelbeck³	0	N/A	18,653.863	18,653.863	0%	224,772
Sigmar Gabriel	4,149.515	-4%	8,974.025	13,123.540	46%	0
Timo Heider	6,397.169	2%	25,846.336	32,243.505	25%	0
Martina Klee	4,149.515	13%	15,418.158	19,567.673	27%	0
Henriette Mark⁵	0	N/A	24,949.893	24,949.893	0%	300,636
Gabriele Platscher	6,224.273	-4%	29,939.872	36,164.145	21%	0
Bernd Rose	7,261.652	5%	27,174.511	34,436.163	27%	0
Yngve Slyngstad²	2,074.758	N/A	0	2,074.758	N/A	0
John Alexander Thain	4,149.515	-4%	19,959.915	24,109.430	21%	0
Michele Trogni	9,336.410	11%	33,979.446	43,315.856	27%	0
Dr. Dagmar Valcárcel	9,336.410	-4%	26,921.443	36,257.853	35%	0
Stefan Viertel	6,656.514	28%	5,199.369	11,855.883	128%	0
Dr. Theodor Weimer	4,149.515	-4%	7,339.140	11,488.655	57%	0
Frank Werneke	6,224.273	N/M	179.289	6,403.562	N/M	0
Prof. Dr. Norbert Winkeljohann	10,806.030	1%	38,562.948	49,368.978	28%	0
Frank Witter	6,224.273	104%	3,047.906	9,272.179	204%	0
Total	130,536.837	9%	530,688.072	661,224.909	37%	1,783,926

¹ At a value of € 12.0496 based on the average closing price on the Frankfurt Stock Exchange (Xetra or successor system) during the last ten trading days of January 2023.

² Member since May 19, 2022.

³ Member until May 19, 2022.

⁴ Member since April 7, 2022.

⁵ Member until March 31, 2022.

All employee representatives on the Supervisory Board, with the exception of Jan Duscheck and Frank Werneke, are employed by Deutsche Bank Group. In the 2022 financial year, we paid such members a total amount of € 1.28 million in the form of salary, retirement and pension compensation in addition to their Supervisory Board compensation.

We do not provide members of the Supervisory Board with any benefits after they have left the Supervisory Board, though members who are or were employed by us are entitled to the benefits associated with the termination of such employment. During 2022, we set aside € 0.07 million for pension, retirement or similar benefits for the members of the Supervisory Board who are or were employed by us.

With the agreement of the Bank's Management Board, Dr. Paul Achleitner (Chairman of the Supervisory Board until May 19, 2022) performed representative functions in various ways on an unpaid basis for the Bank and participated in opportunities for referrals of business for the Bank. These tasks were related to the functional responsibilities of the Chairman of the Supervisory Board of Deutsche Bank AG. In this respect, the reimbursement of costs is provided for in the Articles of Association. On the basis of a separate contractual agreement, the Bank provided Dr. Paul Achleitner with infrastructure and support services free of charge for his services in the interest of the Bank. He was therefore entitled to avail himself of internal resources for preparing and carrying out these activities. The Bank's security and car services were available for Dr. Paul Achleitner for use free of charge for these tasks. The Bank also reimbursed travel expenses and attendance fees and covered the taxes for any non-cash benefits provided. On September 24, 2012, the Chairman's Committee approved the conclusion of this agreement. The provisions applied for the duration of Dr. Paul Achleitner's tenure as Chairman of the Supervisory Board and were reviewed on an annual basis for appropriateness. Under this agreement between Deutsche Bank and Dr. Achleitner, support services equivalent to € 51,000 (2021: € 95,000) were provided and reimbursements for expenses amounting to € 194,000 (2021 € 209,589) were paid during the 2022 financial year.

Comparative presentation of compensation and earnings trends

The following table shows the comparative presentation of the change from year to year in the compensation, in the earnings of the company and the Group as well as the average compensation of employees on a full-time equivalent basis. The information provided pursuant to Section 162 (1) sentence 2 No. 2 of the German Stock Corporation Act will be successively expanded with the change from one financial year to the prior year until a reporting period of five years is reached. Starting with the 2025 financial year, the year-to-year changes will be shown for each of the past five years.

The information on the compensation of the current and former members of the Management Board and Supervisory Board reflects the individualized statement in the Compensation Report of the paid or owed compensation pursuant to Section 162 (1) sentence 2 No. 1 of the German Stock Corporation Act. The presentation of the development of the company's earnings is to reflect, according to the legal requirements, those of the stand-alone listed company, i.e. Deutsche Bank AG. Accordingly, the net income (net loss) of Deutsche Bank AG is used to present earnings within the meaning of Section 162 (1) sentence 2 No. 2 of the German Stock Corporation Act. As the Management Board compensation is measured on the basis of Group figures, the earnings figures for the Group are additionally shown for the comparative presentation. These Group earnings figures are net income (net loss), cost/income ratio and Return on Tangible Equity (RoTE). For the group of employees for the comparison, the data relevant for Deutsche Bank Group were used in light of Deutsche Bank's global workforce. The group of employees for the comparison comprises all of the employees worldwide of Deutsche Bank Group.

	2022	2021	2020	Annual change from 2022 to 2021 in %	Annual change from 2021 to 2020 in %
1. Company profit development					
Net income (net loss) of Deutsche Bank AG (in € m)	5,506	1,919 ¹	(1,769)	187	N/M
Net income (net loss) of Deutsche Bank Group (in € m)	5,525	2,365	495	134	N/M
Cost/income ratio of Deutsche Bank Group (in %)	74.9%	84.6%	88.3%	(11)	(4)
Return on Tangible Equity (RoTE) of Deutsche Bank Group (in %)	9.4%	3.8%	0.2%	147	N/M
2. Average compensation employees					
World-wide on a full-time equivalent basis ²	125,301	120,336	113,350	4	6
3. Management Board compensation (in € t.)					
Current Management Board members					
Christian Sewing (Member since January 1, 2015)	4,394	3,867	3,352	14	15
James von Moltke (Member since July 1, 2017)	3,783	4,009	3,635	(6)	10
Karl von Rohr (Member since November 1, 2015)	3,444	3,235	2,930	6	10
Fabrizio Campelli (Member since November 1, 2019)	2,744	2,420	2,222	13	9
Bernd Leukert (Member since January 1, 2020)	2,593	2,419	2,222	7	9
Alexander von zur Mühlen (Member since August 1, 2020)	3,412	3,157	1,282	8	146
Christiana Riley (Member since January 1, 2020)	3,653	3,079	3,034	19	1
Rebecca Short (Member since May 1, 2021)	2,436	1,606	-	52	N/M
Prof. Dr. Stefan Simon (Member since August 1, 2020)	2,488	2,446	1,007	2	143
Olivier Vigneron (Member since May 20, 2022)	1,508	-	-	N/M	N/M
Members who left the Management Board during the financial year					
Stuart Lewis (Member until May 19, 2022)	2,648	3,079	2,912	(14)	6
Members who left the Management Board before the financial year					
Frank Kuhnke (Member until 30 April 2021)	1,626	2,264	2,207	(28)	3
Werner Steinmüller (Member until July 31, 2020)	283	3,117	2,436	(91)	28
Sylvie Matherat (Member until July 31, 2019)	134	211	2,719 ³	(36)	(92)
Garth Ritchie (Member until July 31, 2019)	268	2,071	4,185 ³	(87)	(51)
Frank Strauß (Member until July 31, 2019)	326	326	2,168	N/M	(85)
Nicolas Moreau (Member until Dec 31, 2018)	317	299	1,826	6	(84)
Kimberly Hammonds (Member until May 24, 2018)	71	124	52	(43)	138
Dr. Marcus Schenck (Member until May 24, 2018)	65	65	65	N/M	N/M
John Cryan (Member until April 8, 2018)	47	47	47	N/M	N/M
Hermann-Josef Lamberti (Member until May 31, 2012)	1,492	1,414	1,450	6	(2)
Josef Ackermann (Member until May 31, 2012)	959	924	911	4	1
4. Supervisory Board compensation (in € tsd.)					
Current Supervisory Board members					
Alexander Wynaendts (Member since May 19, 2022)	496	-	-	N/M	N/M
Detlef Polaschek (Member since May 24, 2018)	450	450	450	N/M	N/M
Prof. Dr. Norbert Winkeljohann (Member since August 1, 2018)	521	496	450	5	10
Ludwig Blomeyer-Bartenstein (Member since May 24, 2018)	300	300	300	N/M	N/M
Mayree Clark (Member since May 24, 2018)	429	450	425	(5)	6
Jan Duschek (Member since August 2, 2016)	300	271	250	11	8
Manja Eifert (Member since April 7, 2022)	117	-	-	N/M	N/M
Sigmar Gabriel (Member since March 11, 2020)	200	200	167	N/M	20
Timo Heider (Member since May 23, 2013)	308	292	250	5	17
Martina Klee (Member since May 29, 2008)	200	171	150	17	14
Gabriele Platscher (Member since June 10, 2003)	300	300	300	N/M	N/M
Bernd Rose (Member since May 23, 2013)	350	321	275	9	17
Yngve Slyngstad (Member since May 19, 2022)	100	-	-	N/M	N/M
John Alexander Thain (Member since May 24, 2018)	200	200	200	N/M	N/M
Michele Trogni (Member since May 24, 2018)	450	392	350	15	12
Dr. Dagmar Valcárcel (Member since August 1, 2019)	450	450	425	N/M	6
Stefan Viertel (Member since January 1, 2021)	321	242	-	33	N/M
Dr. Theodor Weimer (Member since May 20, 2020)	200	200	108	N/M	85
Frank Werneke (Member since November 25, 2021)	300	8	-	N/M	N/M
Frank Witter (Member since May 27, 2021)	300	142	-	111	N/M
Former Members of the Supervisory Board					
Dr. Paul Achleitner (Member until May 19, 2022)	375	871	802	(57)	9
Frank Bsirske (Member until October 27, 2021)	-	250	300	N/M	(17)
Dr. Gerhard Eschelbeck (Member until May 19, 2022)	104	217	150	(52)	45
Henriette Mark (Member until March 31, 2022)	63	250	250	(75)	N/M
Gerd Alexander Schütz (Member until May 27, 2021)	-	50	175	N/M	(71)
Stephan Szukalski (Member until December 31, 2020)	-	-	200	N/M	N/M
Katherine Garrett-Cox (Member until May 20, 2020)	-	-	100	N/M	N/M

¹ Prior year comparatives aligned to the presentation in the current year.

² The average compensation of employees based on a full-time equivalent basis. Improved determination approach for the years 2022-2020.

³ Including termination benefits for 2020.

Compensation of the employees (unaudited)

The content of the 2022 Employee Compensation Report is based on the qualitative and quantitative remuneration disclosure requirements outlined in Article 450 No. 1 (a) to (j) Capital Requirements Regulation (CRR) in conjunction with Section 16 of the Remuneration Ordinance for Institutions (*Institutsvergütungsverordnung* – InstVV).

This Compensation Report takes a group-wide view and covers all consolidated entities of the Deutsche Bank Group. In accordance with regulatory requirements, equivalent reports for 2022 are prepared for the following Significant Institutions within Deutsche Bank Group: BHW Bausparkasse AG, Germany; Deutsche Bank Luxembourg S.A., Luxembourg; Deutsche Bank S.p.A., Italy; Deutsche Bank Mutui S.p.A., Italy; Deutsche Bank S.A.E., Spain.

Regulatory environment

Ensuring compliance with regulatory requirements is an overarching consideration in the bank's Group Compensation Strategy. The bank strives to be at the forefront of implementing regulatory requirements with respect to compensation and will continue to maintain a close exchange with its prudential supervisor, the European Central Bank (ECB), to be in compliance with all existing and new requirements.

As an EU-headquartered institution, Deutsche Bank is subject to the Capital Requirements Regulation/Directive (CRR/CRD) globally, as transposed into German national law in the German Banking Act and InstVV. These rules are applied to all of Deutsche Bank subsidiaries and branches world-wide to the extent required in accordance with Section 27 InstVV. As a Significant Institution within the meaning of InstVV, Deutsche Bank identifies all employees whose work is deemed to have a material impact on the overall risk profile (Material Risk Takers or MRTs) in accordance with the updated criteria stipulated in the German Banking Act and in the Commission Delegated Regulation 2021/923. Deutsche Bank identifies MRTs at a Group level, at the level of Significant Institutions and, in accordance with the German Banking Act, for all CRR institutions at a solo level.

Taking into account more specific sectorial legislation and in accordance with InstVV, some of Deutsche Bank's subsidiaries (in particular within the DWS Group) fall under sector specific remuneration rules, such as the Alternative Investments Fund Managers Directive (AIFMD), the Undertakings for Collective Investments in Transferable Securities Directive (UCITS) and the Investment Firm Directive (IFD) including the applicable local transpositions. MRTs are also identified in these subsidiaries. Identified employees are subject to the remuneration provisions outlined in the applicable Guidelines on sound remuneration policies published by the European Securities and Markets Authority (ESMA) and the European Banking Authority (EBA).

Deutsche Bank takes into account the regulations targeted at employees who engage directly or indirectly with the bank's clients, for instance as per the local transpositions of the Markets in Financial Instruments Directive II – MiFID II. Accordingly, specific provisions for employees deemed to be Relevant Persons are implemented with a view to ensuring that they act in the best interest of the bank's clients.

Where applicable, Deutsche Bank is also subject to specific rules and regulations implemented by local regulators. Many of these requirements are aligned with the InstVV. However, where variations are apparent, proactive and open discussions with regulators have enabled the bank to follow the local regulations whilst ensuring that any impacted employees or locations remain within the bank's overall Group Compensation Framework. This includes, for example, the compensation structures applied to Covered Employees in the United States under the requirements of the Federal Reserve Board. In any case, the InstVV requirements are applied as minimum standards globally.

Compensation governance

Deutsche Bank has a robust governance structure enabling it to operate within the clear parameters of its Compensation Strategy and Policy. In accordance with the German two-tier board structure, the Supervisory Board governs the compensation of the Management Board members while the Management Board oversees compensation matters for all other employees in the Group. Both the Supervisory Board and the Management Board are supported by specific committees and functions, in particular the Compensation Control Committee (CCC), the Compensation Officer, and the Senior Executive Compensation Committee (SECC).

In line with their responsibilities, the bank's control functions are involved in the design and application of the bank's remuneration systems, in the identification of MRTs and in determining the total amount of VC. This includes assessing the impact of employees' behavior and the business-related risks, performance criteria, granting of remuneration and severances as well as ex-post risk adjustments.

Reward governance structure



¹ Does not comprise a complete list of Supervisory Board Committees

² The Integrity Committee was replaced by the Regulatory Oversight Committee

Compensation Control Committee (CCC)

The Supervisory Board has set up the CCC to support in establishing and monitoring the structure of the compensation system for the Management Board Members of Deutsche Bank AG. Furthermore, the CCC monitors the appropriateness of the compensation systems for the employees of Deutsche Bank Group, as established by the Management Board and the SECC. The CCC reviews whether the total amount of variable compensation is affordable and set in accordance with the risk, capital and liquidity situation as well as in alignment with the business and risk strategies. Furthermore, the CCC supports the Supervisory Board in monitoring the MRT identification process.

The CCC consists of the Supervisory Board Chairperson as well as two other Supervisory Board Members representing shareholders and three Supervisory Board Members representing employees. The Committee held six meetings in the calendar year 2022. The members of the Risk Committee attended two meetings as guests, the Chairperson of the Risk Committee attended four meetings as guest. Further details can be found in the Report of the Supervisory Board within the Annual Report.

Compensation Officer

The Management Board, in cooperation with the CCC, has appointed a Group Compensation Officer to support the Supervisory Boards of Deutsche Bank AG and of the bank's Significant Institutions in Germany in performing their compensation related duties. The Compensation Officer is involved in the conceptual review, development, monitoring and application of the employees' compensation systems, the MRT identification and remuneration disclosures on an ongoing basis. The Compensation Officer performs all relevant monitoring obligations independently, provides an assessment on the appropriateness of the design and strategy of the compensation systems for employees at least annually and regularly supports and advises the CCC.

Senior Executive Compensation Committee (SECC)

The SECC is a delegated committee established by the Management Board which has the mandate to develop sustainable compensation principles, to prepare recommendations on Total Compensation levels and to ensure appropriate compensation governance and oversight. The SECC establishes the Compensation and Benefits Strategy and Policy. Moreover, using quantitative and qualitative factors, the SECC assesses Group and divisional performance as a basis for compensation decisions and makes recommendations to the Management Board regarding the total amount of annual variable compensation and its allocation across business divisions and infrastructure functions.

In order to maintain its independence, only representatives from infrastructure and control functions who are not aligned to any of the business divisions are members of the SECC. In 2022, the SECC's membership comprised of the Global Head of Human Resources and the Chief Financial Officer as Co-Chairpersons, the Global Head of Compliance, the Global Head of Performance & Reward as well as an additional representative from both Finance and Risk as voting members. The Compensation Officer, the Deputy Compensation Officer and an additional representative from Finance participated as nonvoting members. The SECC generally meets on a monthly basis but with more frequent meetings during the compensation process. It held twenty meetings in total with regard to the compensation process for the performance year 2022.

Compensation and Benefits Strategy

Deutsche Bank recognizes that its compensation framework plays a vital role in supporting its strategic objectives. It enables the bank to attract and retain the individuals required to achieve the bank's objectives. The Compensation and Benefits Strategy is aligned to Deutsche Bank's business strategy, risk strategy, and to its corporate values and beliefs as outlined below.

Five key objectives of our compensation strategy

- To support the delivery of the bank's client-focused, global bank strategy by attracting and retaining talent across its full range of diverse business models and country locations
- To support the long-term, sustainable performance and development of the bank and a corresponding risk strategy
- To promote and support long-term performance based on cost discipline and efficiency
- To ensure that the bank's compensation practices are safe, by way of risk-adjusting performance outcomes, preventing inappropriate risk taking, ensuring sustained compatibility with capital and liquidity planning, and complying with regulation
- To apply and promote the bank's corporate values of integrity, sustainable performance, client centricity, innovation, discipline and partnership

Core remuneration principles

- Align compensation to shareholder interests and sustained bank-wide profitability, taking account of risk, including environmental, social and governance (ESG) risk
- Apply a gender-neutral, simple and transparent compensation design
- Maximize sustainable performance, both at the employee and the bank-wide level
- Attract and retain the best talent
- Calibrate compensation to reflect different divisions and levels of responsibility
- Ensure compliance with regulatory requirements

Group Compensation Framework

The compensation framework, generally applicable globally across all regions and business lines, emphasizes an appropriate balance between Fixed Pay (FP) and Variable Compensation (VC) – together forming Total Compensation (TC). It aligns incentives for sustainable performance at all levels of Deutsche Bank whilst ensuring the transparency of compensation decisions and their impact on shareholders and employees. The underlying principles of the compensation framework are applied to all employees equally, irrespective of differences in seniority, tenure, gender or ethnicity.

Pursuant to CRD and the requirements subsequently adopted in the German Banking Act, Deutsche Bank is subject to a maximum ratio of 1:1 with regard to fixed-to-variable remuneration components, which was increased to 1:2 with shareholder approval on May 22, 2014 with an approval rate of 95.27%, based on valid votes by 27.68% of the share capital represented at the Annual General Meeting. Nonetheless, the bank has determined that employees in specific infrastructure functions (such as Legal, Group Tax and Human Resources) should continue to be subject to a maximum ratio of 1:1 while Control Functions as defined by InstVV are subject to a maximum ratio of 2:1. These Control Functions comprise Risk, Compliance, Anti-Financial Crime, Group Audit and the Compensation Officer and his Deputy.

The bank has assigned a Reference Total Compensation (RTC) to eligible employees that describes a reference value for their role. This value provides employees with orientation on their FP and VC. Actual individual TC can be at, above or below the Reference Total Compensation, depending on VC decisions.

Fixed Pay is used to compensate employees for their skills, experience and competencies, commensurate with the requirements, size and scope of their role. The appropriate level of FP is determined with reference to the prevailing market rates for each role, internal comparisons and applicable regulatory requirements. FP plays a key role in order to attract and retain the right talent. For the majority of employees, FP is the primary compensation component.

Variable Compensation reflects affordability and performance at Group, divisional, and individual level. It allows the bank to differentiate individual performance and to drive behavior through appropriate incentives that can positively influence culture. It also allows for flexibility in the cost base. VC generally consists of two elements – the Group VC Component and the Individual VC Component.

The Group VC Component is based on one of the overarching goals of the compensation framework – to ensure an explicit link between VC and the performance of the Group. To assess the bank's annual achievements in reaching its strategic targets, the four Key Performance Indicators (KPIs) utilized as the basis for determining the 2022 Group VC Component were: Common Equity Tier 1 (CET 1) Capital Ratio, Cost/Income Ratio (CIR), Post-Tax Return on Tangible Equity (RoTE) and ESG – Sustainable Finance Volume. These four KPIs represent the bank's capital, cost, profitability and sustainability targets.

The Individual VC Component is delivered either in the form of Individual VC or as Recognition Award. An employee's eligibility to receive either of these VC elements depends on division, region, profession, and Corporate Title. In case of negative performance contributions or misconduct, an employee's VC can be reduced accordingly and can go down to zero. VC is granted and paid out subject to Group affordability. Under the compensation framework, there continues to be no guarantee of VC in an existing employment relationship. Such arrangements are utilized only on a very limited basis for new hires in the first year of employment and are subject to the bank's standard deferral requirements.

Key components of the compensation framework



Individual VC takes into consideration a number of financial and nonfinancial factors, including the applicable divisional performance, the employee's individual performance, conduct, and adherence to values and beliefs, as well as additional factors such as the bank's strategic decisions and retention considerations.

Recognition Awards provide the opportunity to acknowledge and reward outstanding contributions made by the employees of lower seniority levels in a timely and transparent manner. Generally, the overall size of the Recognition Award budget is directly linked to a set percentage of FP for the eligible population and it can be paid out up to four times a year, following a review of nominations and contributions in a process managed at the divisional level.

In the context of InstVV, **severance payments** are considered variable compensation. The bank's severance framework ensures full alignment with the respective InstVV requirements.

Employee benefits complement Total Compensation and are considered FP from a regulatory perspective, as they have no direct link to performance or discretion. They are granted in accordance with applicable local market practices and requirements. Pension expenses represent the main element of the bank's benefits portfolio globally.

Employee groups with specific compensation structures

For some areas of the bank, compensation structures apply that deviate, within regulatory boundaries, in some aspects from the Group Compensation Framework outlined above.

Postbank units

While generally executive staff of former Postbank follow the remuneration structure of Deutsche Bank, the compensation for any other staff in Postbank units is based on specific frameworks agreed with trade unions or with the respective workers' councils. Where no collective agreements exist, compensation is subject to individual contracts. In general, nonexecutive and tariff staff in Postbank units receive VC, but the structure and portion of VC can differ between legal entities.

DWS

The vast majority of DWS asset management entities and employees fall under AIFMD, UCITS or IFD, while a limited number of employees remain in scope of the bank's Group Compensation Framework and InstVV. DWS has established its own compensation governance, policy, and structures, as well as Risk Taker identification process in line with AIFMD/UCITS/IFD requirements. These structures and processes are aligned with InstVV where required but tailored towards the Asset Management business. Pursuant to the ESMA Guidelines, DWS's compensation strategy is designed to ensure an appropriate ratio between fixed and variable compensation.

Generally, DWS applies remuneration rules that are equivalent to the Deutsche Bank Group approach, but use DWS Group-related parameters, where possible. Notable deviations from the Group Compensation Framework include the use of share-based instruments linked to DWS shares and fund-linked instruments. These serve to improve the alignment of employee compensation with DWS' shareholders' and investors' interests.

Tariff staff

Within Deutsche Bank Group there are 15,191 tariff employees in Germany (based on full-time equivalent). Tariff staff are either subject to a collective agreement (*Tarifvertrag für das private Bankgewerbe und die öffentlichen Banken*), as negotiated between trade unions and employer associations, or subject to agreements as negotiated with the respective trade unions directly. The remuneration of tariff staff is included in the quantitative disclosures in this Report.

Determination of performance-based variable compensation

The bank puts a strong focus on its governance related to compensation decision-making processes. A robust set of rule-based principles for compensation decisions with close links to the performance of both business and individual were applied.

The total amount of VC for any given performance year is derived from an assessment of the bank's profitability, solvency, and liquidity position, and the determination of VC pools for divisions and infrastructure functions based on their performance in support of achieving the bank's strategic objectives.

In a first step, Deutsche Bank assesses the bank's profitability, solvency and liquidity position in line with its Risk Appetite Framework, including a holistic review against the bank's multi-year strategic plan to determine what the bank "can" award in line with regulatory requirements (i.e. Group affordability). In the next step, the bank assesses divisional risk-adjusted performance, i.e. what the bank "should" award in order to provide an appropriate compensation for contributions to the bank's success.

When assessing divisional performance, a range of considerations are referenced. Performance is assessed in the context of financial and – based on Balanced Scorecards – nonfinancial targets. The financial targets for front-office divisions are subject to appropriate risk-adjustment, in particular by referencing the degree of future potential risks to which Deutsche Bank may be exposed, and the amount of capital required to absorb severe unexpected losses arising from these risks. For the infrastructure functions, the financial performance assessment is mainly based on the achievement of cost targets. While the allocation of VC to infrastructure functions, and in particular to control functions, depends on both Deutsche Bank's overall and their own performance, it is not dependent on the performance of the division(s) that these functions oversee.

At the level of the individual employee, the Variable Compensation Guiding Principles are established, which detail the factors and metrics that have to be taken into account when making Individual VC decisions. Managers must fully appreciate the risk-taking activities of individuals to ensure that VC allocations are balanced and risk-taking is not inappropriately incentivized. The factors and metrics to be considered include, but are not limited to, (i) business delivery ("What"), i.e. quantitative and qualitative financial, risk-adjusted and nonfinancial performance metrics, and (ii) behavior ("How"), i.e. culture, conduct and control considerations such as qualitative inputs from control functions or disciplinary sanctions. Generally, performance is assessed based on a one year period. However, for Management Board members of Significant Institutions, the performance across three years is taken into account.

Variable compensation structure

The compensation structures are designed to provide a mechanism that promotes and supports long-term performance of employees and the bank. Whilst a portion of VC is paid upfront, these structures require that an appropriate portion is deferred to ensure alignment to the sustainable performance of the Group. For both parts of VC, Deutsche Bank shares are used as instruments and as an effective way to align compensation with Deutsche Bank's sustainable performance and the interests of shareholders.

The bank continues to go beyond regulatory requirements with the scope as well as the amount of VC that is deferred and the minimum deferral periods for certain employee groups. The deferral rate and period are determined based on the risk categorization of the employee, the division and the business unit. Where applicable, the bank starts to defer parts of variable compensation for MRTs where VC is set at or above € 50,000 or where VC exceeds 1/3 of TC. For non-MRTs, deferrals start at higher levels of VC. MRTs are on average subject to deferral rates in excess of the minimum 40% (60% for Senior Management) as required by InstVV. For MRTs in Material Business Units (MBU) the bank applies a deferral rate of at least 50%. The VC threshold for MRTs requiring at least 60% deferral is set at € 500,000.

Furthermore, Directors and Managing Directors in Corporate Bank (CB), Investment Bank (IB) or Capital Release Unit (CRU) are subject to a VC deferral rate of 100% with respect to any VC in excess of € 500,000. Moreover, if fixed pay for these employees exceeds an amount of € 500,000, the full VC is deferred.

As detailed in the table below, deferral periods range from three to five years, dependent on employee groups.

Overview on 2022 award types (excluding DWS Group)

Award Type	Description	Beneficiaries	Deferral Period	Retention Period	Proportion
Upfront: Cash VC	Upfront cash portion	All eligible employees	N/A	N/A	MRTs with VC ≥ € 50,000 or where VC exceeds 1/3 of TC: 50% of upfront VC Non-MRTs with 2022 TC ≤ € 500,000: 100% of upfront VC
Upfront: Equity Upfront Award (EUA)	Upfront equity portion (linked to Deutsche Bank's share price over the retention period)	All MRTs with VC ≥ € 50,000 or where VC exceeds 1/3 of TC All employees with 2022 TC > € 500,000	N/A	12 months	50% of upfront VC
Deferred: Restricted Incentive Award (RIA)	Deferred cash portion	All employees with deferred VC	Equal tranche vesting: MRTs: 4 years Senior Mgmt. ¹ : 5 years Non-MRTs in IB/CB/CRU: 4 years Other non-MRTs: 3 years	N/A	50% of deferred VC
Deferred: Restricted Equity Award (REA)	Deferred equity portion (linked to Deutsche Bank's share price over the vesting and retention period)	All employees with deferred VC	Equal tranche vesting: MRTs: 4 years Senior Mgmt. ¹ : 5 years Non-MRTs in IB/CB/CRU: 4 years Other non-MRTs: 3 years	12 months for MRTs	50% of deferred VC

N/A – Not applicable

¹ For the purpose of Performance Year 2022 annual awards, Senior Management is defined as Deutsche Bank AG MB-1 positions; voting members of Business Division Top Executive Committees; MB members of Significant Institutions; respective MB-1 positions with managerial responsibility; for the specific deferral rules for the Management Board of Deutsche Bank AG refer to the Compensation Report for the Management Board.

Employees are not allowed to sell, pledge, transfer or assign a deferred award or any rights in respect to the award. They may not enter into any transaction having an economic effect of hedging any variable compensation, for example offsetting the risk of price movement with respect to the equity-based award. The Human Resources and Compliance functions, overseen by the Compensation Officer, work together to monitor employee trading activity and to ensure that all employees comply with this requirement.

Ex-post risk adjustment of variable compensation

In line with regulatory requirements relating to ex-post risk adjustment of variable compensation, the bank believes that a long-term view on conduct and performance of its employees is a key element of deferred VC. As a result, under the Management Board's oversight, all deferred awards are subject to performance conditions and forfeiture provisions as detailed below.

Overview on Deutsche Bank Group performance conditions and forfeiture provisions of variable compensation granted for Performance Year 2022

Provision	Description	Forfeiture
Solvency and Liquidity	If at the quarter end preceding vesting and release, any one of the following falls below a defined Risk Appetite threshold: CET1 Capital Ratio; Leverage Ratio; Economic Capital Adequacy Ratio; Liquidity Coverage Ratio; Liquidity Reserves	Between 10% and 100% of the next tranche of deferred award due for delivery / of the Equity Upfront Award, depending on the Risk Appetite threshold and the extent the Group / Divisional PBT condition(s) is/ are met
Group PBT	If for the financial year end preceding the vesting date adjusted Group PBT is negative ¹	Between 10% and 100% of the next tranche of deferred award due for delivery, depending on the extent Solvency and Liquidity condition is met and whether Divisional PBT condition is met (if applicable)
Divisional PBT	If for the financial year end preceding the vesting date adjusted Divisional PBT is negative ¹	Between 10% and 100% of the next tranche of deferred award due for delivery, depending on the extent Solvency and Liquidity condition is met and whether Group PBT condition is met
Forfeiture Provisions ²	<ul style="list-style-type: none"> – In the event of an internal policy or procedure breach, breach of any applicable laws or regulations, or a Control Failure – If any award was based on performance measures or assumptions that are later deemed to be materially inaccurate – Where a Significant Adverse Event occurs, and the Participant is considered sufficiently proximate – If forfeiture is required to comply with prevailing regulatory requirements 	Up to 100% of undelivered awards
Clawback	In the event an InstVV MRT participated in conduct that resulted in significant loss or regulatory sanction/supervisory measures; or failed to comply with relevant external or internal rules regarding appropriate standards of conduct	100% of award which has been delivered, before the second anniversary of the last vesting date for the award

¹ Considering clearly defined and governed adjustments for relevant Profit and Loss items (e.g., business restructurings; impairments of goodwill or intangibles).

² Other provisions may apply as outlined in the respective plan rules.

Compensation decisions for 2022

Year-end considerations and decisions for 2022

All compensation decisions are made within the boundaries of regulatory requirements. These requirements form the overarching framework for determining compensation at Deutsche Bank. In particular, management must ensure that compensation decisions are not detrimental to maintaining the bank's sound capital base and liquidity reserves.

In an environment of increasing geopolitical uncertainties and macroeconomic challenges the bank delivered its best results for more than a decade. This underlines the successful completion of the bank's strategic transformation announced in 2019. Deutsche Bank's key goals were achieved, and its earnings power was significantly improved. As a result, the bank is significantly more profitable with a pre-tax profit of € 5.6 billion and a net profit of € 5.7 billion.

Although 2022 was a successful year for Deutsche Bank, the bank again adopted a measured and forward-looking approach when deciding on variable compensation for 2022. This approach balanced the need to remain within the boundaries of affordability with the need to remunerate its employees fairly. When determining the level of year-end performance-based VC, the bank weighed the successful transformation and strong business performance against the current uncertain economic outlook and considerations of prudent capital planning and long-term capital stability. This resulted in VC levels for 2022 which are more conservative than the bank's financial performance, at the Group and divisional level, might have indicated. As in previous years, the SECC continuously monitored and reviewed the implications of potential VC awards, both for the bank's capital and liquidity base and for its ambitious cost targets.

With due consideration for all these factors, the Management Board determined that the bank is in a position to award variable compensation, including a year-end performance-based VC pool, of € 2.126 billion for 2022 (2021: € 2.099 billion). The VC for the Management Board of Deutsche Bank AG was determined, as always, by the Supervisory Board in a separate process, but is included in the tables and charts below.

As part of the overall 2022 VC awards granted in March 2023, the Group VC Component was awarded to all eligible employees in line with the assessment of the four defined KPIs which are outlined in the Group Compensation Framework chapter of this Report. The Management Board determined a payout rate of 80% for the Group VC Component in 2022, compared to 77.5% in 2021 and 72.5% in 2020.

The slight year-on-year increase of 2022 year-end performance-based VC reflects both Deutsche Bank's strong performance and the need for prudence.

Compensation awards for 2022 – all employees

	2022									2021	
in € m. (unless stated otherwise) ¹	Super- visory Board ²	Mana- gement Board ³	IB ³	CB ³	PB ³	AM ³	CRU ³	Control Func- tions ³	Corporate Func- tions ³	Group Total	Group Total
Number of employees (full-time equivalent)	20	10	7,657	13,980	26,951	4,283	194	6,725	25,130	84,930	82,969
Total compensation	7	76	2,256	1,306	2,540	772	52	779	2,457	10,237	9,912
Base salary and allowances	7	28	1,209	946	1,910	473	30	631	1,907	7,135	6,811
Pension expenses	0	6	71	76	152	41	2	53	139	540	537
Fixed Pay according to § 2 InstVV	7	35	1,280	1,022	2,062	514	32	684	2,046	7,674	7,348
Year-end performance-based VC ⁴	0	41	945	226	284	209	17	76	327	2,126	2,099
Other VC ⁴	0	0	4	6	43	32	0	5	19	110	135
Severance payments	0	0	27	52	151	17	3	14	65	328	330
Variable Pay according to § 2 InstVV	0	41	976	284	478	258	19	94	411	2,563	2,564

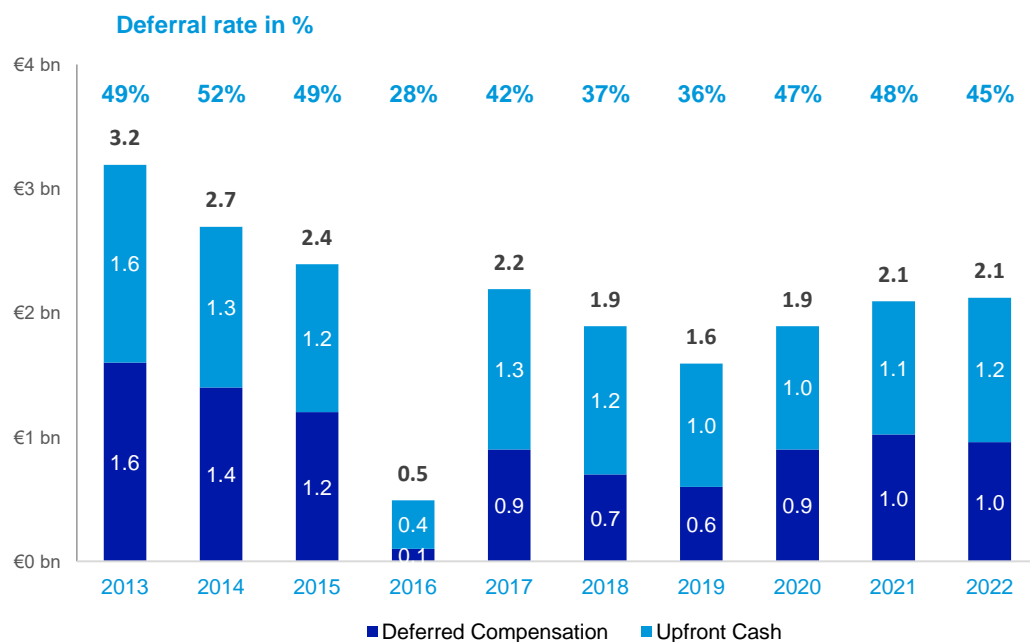
¹ The table may contain marginal rounding differences; FTE (full-time equivalent) as of December 31, 2022.

² Supervisory Board represents the Supervisory Board Members of Deutsche Bank AG (they are not considered for the Group Total number of employees); employee representatives are considered with their compensation for the Supervisory Board role only (their employee compensation is included in the relevant divisional column); the remuneration for members of the Deutsche Bank AG Supervisory Board is not reflected in the Group Total.

³ Management Board represents the Management Board Members of Deutsche Bank AG; IB = Investment Bank; CB = Corporate Bank; PB = Private Bank; AM = Asset Management; CRU = Capital Release Unit; Control Functions include Chief Risk Office, Group Audit, Compliance and Anti-Financial Crime; Corporate Functions include any Infrastructure function which is neither captured as a Control Function nor part of any division.

⁴ Year-end performance-based VC includes Individual and Group VC; other VC includes other contractual VC commitments such as sign-on awards, retention awards, recognition awards and specific VC elements for tariff staff and civil servants; it also includes fringe benefits awarded to Management Board Members of Deutsche Bank AG which are to be classified as variable remuneration; the table does not include new hire replacement awards for lost entitlements from previous employers (buyouts).

Reported year-end performance-based variable compensation and deferral rates year over year – all employees



Due to rounding, numbers presented may not add up precisely to the totals.

Deutsche Bank continues to apply deferral structures that go beyond the regulatory minimum, resulting in an overall deferral rate (all employees including non-MRT population) of 45% in 2022. For the MRT population only, the deferral rate amounts to 90%.

Material Risk Taker compensation disclosure

On a global basis, 1,426 employees were identified as MRTs according to InstVV for financial year 2022, compared to 1,263 employees for 2021. This increase is attributable to the increased number of quantitative (remuneration driven) MRTs. The number of 2022 Group MRTs amounts to 1,171 individuals. Moreover, 194 individuals were identified by Significant Institutions (thereof 44 Group MRTs) and 123 individuals were identified by Other CRR Institutions (thereof 17 Group MRTs and one MRT identified by a Significant Institution). The remuneration elements for all those MRTs on a consolidated basis are detailed in the tables below in accordance with Section 16 InstVV and Article 450 CRR.

With regard to deferral arrangements and pay-out instruments, 87 MRTs identified by Other CRR Institutions, whose total remuneration amounts to € 18.7 million (thereof € 7.2 million variable remuneration including severance payments) benefit from a derogation laid down in Article 94(3) CRD point (a) and 61 MRTs identified by Group or Significant Institutions, whose total remuneration amounts to € 9.7 million (thereof € 1.6 million variable remuneration including severance payments) benefit from a derogation laid down in Article 94(3) CRD point (b).

Remuneration for 2022 - Material Risk Takers (REM 1)

		2022				
	in € m. (unless stated otherwise) ¹	Super- visory Board ²	Manage- ment Board ³	Senior Management ⁴	Other Material Risk Takers	Group Total
Fixed Pay	Number of MRTs ⁵	20	10	236	1,021	1,286
	Total Fixed Pay	7	35	157	628	826
	of which: cash-based	5	30	148	597	780
	of which: shares or equivalent ownership interests	2	0	0	0	2
	of which: share-linked instruments or equivalent non-cash instruments	0	0	0	0	0
	of which: other instruments	0	0	0	0	0
	of which: other forms	0	5	9	31	45
Variable Pay	Number of MRTs ⁵	0	10	231	984	1,224
	Total Variable Pay ⁶	0	41	129	579	750
	of which: cash-based	0	21	69	302	392
	of which: deferred	0	20	46	228	294
	of which: shares or equivalent ownership interests	0	21	52	277	349
	of which: deferred	0	21	42	227	290
	of which: share-linked instruments or equivalent non-cash instruments	0	0	7	1	8
	of which: deferred	0	0	5	1	5
	of which: other instruments	0	0	1	0	1
	of which: deferred	0	0	1	0	1
	of which: other forms	0	0	0	0	0
	of which: deferred	0	0	0	0	0
Total Pay		7	76	286	1,207	1,576

¹ The table may contain marginal rounding differences.

² Supervisory Board represents the Supervisory Board Members of Deutsche Bank AG.

³ Management Board represents the Management Board Members of Deutsche Bank AG.

⁴ Senior Management is defined as Deutsche Bank AG MB-1 positions; voting members of Business Division Top Executive Committees; MB members of Significant and Other CRR Institutions and respective MB-1 positions with managerial responsibility.

⁵ Beneficiaries only (HC reported for Supervisory Board and Management Board, FTE reported for the remaining part); therefore, the totals do not add up to the 1,426 individuals identified as MRTs.

⁶ Variable Pay includes Deutsche Bank's Year-end performance-based VC for 2022, other VC and severance payments; it also includes fringe benefits awarded to Management Board Members of Deutsche Bank AG which are to be classified as variable remuneration; the table does not include new hire replacement awards for lost entitlements from previous employers (buyouts).

Guaranteed variable remuneration and severance payments - Material Risk Takers (REM 2)

	2022				
in € m. (unless stated otherwise) ¹	Super- visory Board ²	Manage- ment Board ³	Senior Management ⁴	Other Material Risk Takers	Group Total
Guaranteed variable remuneration awards					
Number of MRTs ⁵	1	0	1	9	10
Total amount	0	0	0	8	8
of which: paid during financial year, not taken into account in bonus cap	0	0	0	2	2
Severance payments awarded in previous periods, paid out during financial year					
Number of MRTs ⁵	0	0	0	0	0
Total amount	0	0	0	0	0
Severance payments awarded during financial year					
Number of MRTs ⁵	0	0	10	38	48
Total amount ⁶	0	0	11	21	32
of which: paid during financial year	0	0	9	20	29
of which: deferred	0	0	2	1	3
of which: paid during financial year, not taken into account in bonus cap	0	0	9	20	29

¹ The table may contain marginal rounding differences.

² Supervisory Board represents the Supervisory Board Members of Deutsche Bank AG.

³ Management Board represents the Management Board Members of Deutsche Bank AG.

⁴ Senior Management is defined as Deutsche Bank AG MB-1 positions; voting members of Business Division Top Executive Committees; MB members of Significant and Other CRR Institutions and respective MB-1 positions with managerial responsibility.

⁵ Beneficiaries only (HC reported for all categories).

⁶ Severance payments are generally not taken into account for the bonus cap; the highest single severance payment made in 2022 amounts to € 4,054,481.

Deferred remuneration - Material Risk Takers (REM 3)

	2022							
in € m. (unless stated otherwise) ¹	Total amount of deferred remuneration awarded for previous performance periods	Of which due to vest in the financial year	Of which vesting in subsequent financial years	Amount of performance adjustment made in the financial year to deferred remuneration that was due to vest in the financial year	Amount of performance adjustment made in the financial year to deferred remuneration that was due to vest in future performance years	Total amount of adjustment during the financial year due to ex post implicit adjustments ⁵	Total amount of deferred remuneration awarded before the financial year actually paid out in the financial year ⁶	Total of amount of deferred remuneration awarded for previous performance period that has vested but is subject to retention periods
Supervisory Board²	1	0	0	0	0	0	0	0
Cash-based	0	0	0	0	0	0	0	0
Shares or equivalent ownership interests	0	0	0	0	0	0	0	0
Share-linked instruments or equivalent non-cash instruments	0	0	0	0	0	0	0	0
Other instruments	0	0	0	0	0	0	0	0
Other forms	0	0	0	0	0	0	0	0
Management Board³	91	9	83	0	0	(5)	9	3
Cash-based	39	5	34	0	0	0	5	0
Shares or equivalent ownership interests	52	4	49	0	0	(5)	4	3
Share-linked instruments or equivalent non-cash instruments	0	0	0	0	0	0	0	0
Other instruments	0	0	0	0	0	0	0	0
Other forms	0	0	0	0	0	0	0	0
Senior management⁴	357	104	253	0	0	(16)	104	47
Cash-based	174	53	121	0	0	0	53	0
Shares or equivalent ownership interests	167	48	119	0	0	(14)	48	44
Share-linked instruments or equivalent non-cash instruments	14	3	11	0	0	(2)	3	3
Other instruments	2	0	2	0	0	0	0	0
Other forms	0	0	0	0	0	0	0	0
Other Material Risk Takers	1,601	441	1,160	1	3	(75)	438	137
Cash-based	820	248	573	1	1	0	246	0
Shares or equivalent ownership interests	777	192	585	0	1	(74)	191	137
Share-linked instruments or equivalent non-cash instruments	4	1	2	0	0	(1)	1	0
Other instruments	0	0	0	0	0	0	0	0
Other forms	0	0	0	0	0	0	0	0
Total amount	2,049	554	1,496	1	3	(96)	551	188

¹ The table may contain marginal rounding differences.

² Supervisory Board represents the Supervisory Board Members of Deutsche Bank AG.

³ Management Board represents the Management Board Members of Deutsche Bank AG.

⁴ Senior Management is defined as Deutsche Bank AG MB-1 positions; voting members of Business Division Top Executive Committees; MB members of Significant and Other CRR Institutions and respective MB-1 positions with managerial responsibility.

⁵ Changes of value of deferred remuneration due to the changes of prices of instruments.

⁶ Defined as remuneration awarded before the financial year which vested in the financial year (including where subject to a retention period).

Remuneration of high earners – Material Risk Takers (REM 4)

in €	2022	2021
	Number of individuals ¹	Number of individuals ²
Total Pay ³		
1,000,000 to 1,499,999	299	234
1,500,000 to 1,999,999	120	115
2,000,000 to 2,499,999	47	56
2,500,000 to 2,999,999	36	33
3,000,000 to 3,499,999	16	19
3,500,000 to 3,999,999	12	19
4,000,000 to 4,499,999	9	9
4,500,000 to 4,999,999	5	4
5,000,000 to 5,999,999	7	10
6,000,000 to 6,999,999	6	6
7,000,000 to 7,999,999	8	8
8,000,000 to 8,999,999	4	3
9,000,000 to 9,999,999	2	3
10,000,000 to 10,999,999	1	1
Total	572	520

¹ Comprises MRTs only (including 2022 leavers).

² Comprises Group MRTs only; the total (incl. MRTs of Significant and Other CRR Institutions) corresponds to 524 MRT High Earners.

³ Includes all components of FP and VC (including severances); buyouts are not included.

In total, 572 MRTs received a Total Pay of € 1 million or more for 2022.

Compensation awards 2022 – Material Risk Takers (REM 5)

in € m. (unless stated otherwise) ¹	Management Body Remuneration			Business Areas							Total
	Super- visory Board ²	Manage- ment Board ²	Total Manage- ment Body	IB ²	CB ²	PB ²	AM ²	CRU ²	Corporate Functions ²	Control Functions ²	
Total number of Material Risk Takers³											1,286
of which: Management Body	20	10	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
of which: Senior Management ⁴	N/A	N/A	N/A	16	29	59	6	6	88	32	236
of which: Other Material Risk Takers	N/A	N/A	N/A	578	79	127	6	15	133	83	1,021
Total Pay of Material Risk Takers	7	76	83	945	110	154	28	19	177	60	1,576
of which: variable pay ⁵	0	41	41	471	58	72	13	9	73	14	750
of which: fixed pay	7	35	41	475	53	82	15	10	104	46	826

¹ The table may contain marginal rounding differences.

² Supervisory Board represents the Supervisory Board Members of Deutsche Bank AG; Management Board represents the Management Board Members of Deutsche Bank AG; IB = Investment Bank; CB = Corporate Bank; PB = Private Bank; AM = Asset Management; CRU = Capital Release Unit; Control Functions include Chief Risk Office, Group Audit, Compliance and Anti-Financial Crime; Corporate Functions include any Infrastructure function which is neither captured as a Control Function nor part of any division.

³ HC reported for Supervisory Board and Management Board, FTE reported for the remaining part; therefore, the totals do not add up to the 1,426 individuals identified as MRTs.

⁴ Senior Management is defined as Deutsche Bank AG MB-1 positions; voting members of Business Division Top Executive Committees; MB members of Significant and Other CRR Institutions and respective MB-1 positions with managerial responsibility.

⁵ Variable Pay includes Deutsche Bank's Year-end performance-based VC for 2022, other VC and severance payments; it also includes fringe benefits awarded to Management Board Members of Deutsche Bank AG which are to be classified as variable remuneration; the table does not include new hire replacement awards for lost entitlements from previous employers (buyouts).

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Corporate Governance Statement according to Sections 289f and 315d of the German Commercial Code/Corporate Governance Report

530	Management Board and Supervisory Board
546	Reporting and Transparency
546	Related Party Transactions
547	Auditing and Controlling
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All information presented in this Corporate Governance Statement according to Sections 289f and 315d of the German Commercial Code is as of February 10, 2023.

Management Board and Supervisory Board

Management Board

Deutsche Bank's Management Board is responsible for the management of the company in accordance with the law, its Articles of Association and the Terms of Reference for the Management Board with the objective of creating sustainable value in the interests of the company. It considers the interests of shareholders, employees and other company-related stakeholders. The members of the Management Board are collectively responsible for managing the bank's business. The Management Board, as the Group Management Board, manages Deutsche Bank Group in accordance with uniform guidelines; it exercises general control over all Group companies.

The Management Board decides on all matters prescribed by law and the Articles of Association and ensures compliance with the legal requirements and internal guidelines (compliance). It also takes the necessary measures to ensure that adequate internal guidelines are developed and implemented. The Management Board's responsibilities include, in particular, the bank's strategic management and direction, the allocation of resources, financial accounting and reporting, control and risk management, the proper functioning of the business organization, the systematic identification and assessment of the environmental and social impacts of the company's operations as well as corporate control. The Management Board decides on the appointments to the senior management level below the Management Board and, in particular, on the appointment of Global Key Function Holders. In appointing people to management functions in the Group, the Management Board takes diversity into account and strives, in particular, to achieve an appropriate representation of women (more detailed information in section "Targets for the proportion of women in management positions/gender quota" in this Corporate Governance Statement).

The Management Board works closely together with the Supervisory Board in a cooperative relationship of trust and for the benefit of the company. The Management Board reports to the Supervisory Board at a minimum within the scope prescribed by law or administrative guidelines, in particular on all issues with relevance for the Group concerning strategy, the intended business policy, planning, business development, risk situation, risk management, staff development, reputation and compliance.

A comprehensive presentation of the duties, responsibilities and procedures of our Management Board is specified in its Terms of Reference, the current version of which is available on our website (www.db.com/ir/en/documents.htm).

Personnel changes to the Management Board and the current members of the Management Board

The following member of the Management Board was appointed for a three-year period:

- Olivier Vigneron with effect from May 20, 2022.

The following member left the Management Board:

- Stuart Lewis as of May 19, 2022.

The following information is provided on the current members of the Management Board on the year in which they were born, year in which they were first appointed and year in which their term expires as well as their current positions and area of responsibility according to the current Business Allocation Plan for the Management Board. Also specified are their other board mandates or directorships outside of Deutsche Bank Group as well as all memberships in legally prescribed supervisory boards or other comparable domestic or foreign supervisory bodies of commercial enterprises. Listed companies are marked with an "*". The Terms of Reference for the Management Board specify that the members of our Management Board generally should not accept the chair of supervisory boards of companies outside Deutsche Bank Group.

Christian Sewing

Year of birth: 1970

First appointed: 2015

Term expires: 2026

Christian Sewing became a member of the Management Board on January 1, 2015, and is Chief Executive Officer with effect from April 8, 2018. He is responsible on the Management Board for Communications & Corporate Social Responsibility (CSR), Research, Group Audit and Human Resources.

Prior to assuming his role on the Management Board, Mr. Sewing was Global Head of Group Audit and held a number of positions before that in Risk, including Deputy Chief Risk Officer (from 2012 to 2013) and Chief Credit Officer (from 2010 to 2012) of Deutsche Bank.

From 2005 until 2007, Mr. Sewing was a member of the Management Board of Deutsche Genossenschafts-Hypothekenbank.

Before graduating with a diploma from the Bankakademie Bielefeld and Hamburg, Mr. Sewing completed a bank apprenticeship at Deutsche Bank in 1989.

Mr. Sewing does not have any external directorships subject to disclosure.

James von Moltke

Year of birth: 1969

First appointed: 2017

Term expires: 2026

James von Moltke became a member of the Management Board on July 1, 2017, and President as of March 25, 2022. He is Chief Financial Officer and in this function he is responsible for, among other things, Finance, Group Tax, Treasury and Investor Relations.

Before Mr. von Moltke joined Deutsche Bank he served as Treasurer of Citigroup. He started his career at the investment bank Credit Suisse First Boston in London in 1992. In 1995, he joined J.P. Morgan, working at the bank for 10 years in New York and Hong Kong. After next working at Morgan Stanley in New York for four years, where he led the Financial Technology advisory team globally, Mr. von Moltke joined Citigroup as Head of Corporate Mergers and Acquisitions (M&A) in 2009 and three years later became the Global Head of Financial Planning.

He holds a Bachelor of Arts degree from New College, University of Oxford.

Mr. von Moltke does not have any external directorships subject to disclosure.

Karl von Rohr

Year of birth: 1965

First appointed: 2015

Term expires: 2023

Karl von Rohr became a member of the Management Board on November 1, 2015, and President as of April 8, 2018. He is responsible on the Management Board for the Private Bank and Asset Management. He is also Regional Chief Executive Officer (CEO) for Germany, as well as for the EMEA Region (Europe, Middle East and Africa).

Mr. von Rohr joined Deutsche Bank in 1997. From November 2015 to November 2019 he was the Management Board member responsible for Human Resources and until July 2020, he was responsible for Legal, Group Governance and Government & Regulatory Affairs. From 2013 to 2015 he was Global Chief Operating Officer, Regional Management. Prior to this, he was Head of Human Resources for Deutsche Bank in Germany and member of the Management Board of Deutsche Bank Privat- und Geschäftskunden AG. During his time at Deutsche Bank, he has held various senior management positions in other divisions in Germany and Belgium.

He studied law at the universities of Bonn (Germany), Kiel (Germany), Lausanne (Switzerland) and at Cornell University (U.S.A.).

Mr. von Rohr does not have any external directorships subject to disclosure.

He is Chairman of the Supervisory Board of DWS Group GmbH & Co. KGaA.*

Fabrizio Campelli

Year of birth: 1973
First appointed: 2019
Term expires: 2025

Fabrizio Campelli became a member of the Management Board on November 1, 2019. He is responsible for the Corporate Bank and the Investment Bank and also for the bank's UK & Ireland region.

From November 2019 to April 2021, he was the Management Board member responsible for transformation, as Chief Transformation Officer, and for Human Resources. He previously spent four years as the Global Head of Deutsche Bank Wealth Management. Before that, he was Head of Strategy & Organizational Development as well as Deputy Chief Operating Officer for Deutsche Bank Group.

He joined Deutsche Bank in 2004 after working at McKinsey & Company in the firm's London and Milan offices, focusing on strategic assignments mainly for global financial institutions.

He holds an MBA from MIT Sloan School of Management and a Business Administration degree from Bocconi University in Milan.

Mr. Campelli has been a member of the following Supervisory Boards: BVV Versicherungsverein des Bankgewerbes a.G. and BVV Versorgungskasse des Bankgewerbes e.V.

Bernd Leukert

Year of birth: 1967
First appointed: 2020
Term expires: 2025

Bernd Leukert became a member of the Management Board on January 1, 2020. He is Chief Technology, Data and Innovation Officer and is responsible for the Chief Information Office for the Infrastructure areas and the business divisions, as well as for the Chief Technology Office and the Chief Security Office. He is also responsible for Data Governance and Oversight and Trade Settlement as well as for Cloud and Innovation.

He joined Deutsche Bank on September 1, 2019. He previously worked for many years at SAP SE, the global software company. He joined SAP in 1994 and held various management positions. From 2014 to 2019, he was responsible for product development and innovations as well as the Digital Business Services division on the Executive Board.

Mr. Leukert studied Industrial Engineering and Management at the University of Karlsruhe and at Trinity College Dublin, graduating in 1994 with a Master's Degree in Business Administration.

He is member of the Supervisory Board of Bertelsmann SE & Co. KGaA.

He is a member of the Supervisory Board of DWS Group GmbH & Co. KGaA.*

Alexander von zur Mühlen

Year of birth: 1975
First appointed: 2020
Term expires: 2026

Alexander von zur Mühlen became a member of the Management Board on August 1, 2020. He is Regional CEO Asia Pacific.

Mr. von zur Mühlen joined Deutsche Bank in 1998 and over the years has held a range of management roles in London and Frankfurt across infrastructure and business divisions. From 2018 to 2020 he was responsible for the Group's strategic development and was the advisor to the Chief Executive Officer (CEO). Before that, he served as Co-Head of Global Capital Markets, with a regional focus on Asia-Pacific and Europe, the Middle East and Africa (EMEA). From 2009 to 2017, he was Group Treasurer.

Alexander von zur Mühlen holds a Diploma in Business Administration from the Berlin School of Economics and Law in Berlin.

Mr. von zur Mühlen does not have any external directorships subject to disclosure.

Christiana Riley

Year of birth: 1978
First appointed: 2020
Term expires: 2025

Christiana Riley became a member of the Management Board on January 1, 2020. She is Regional CEO Americas.

Ms. Riley joined Deutsche Bank in 2006 where she was recently the Chief Financial Officer of the Corporate & Investment Bank. She previously spent nine years in Group Strategy & Planning, which she led from 2011 to 2015. Prior to this Ms. Riley worked at the management consultancy McKinsey & Company and at the investment bank Greenhill & Co.

She graduated cum laude in 2000 from Princeton University in America where she studied Romance Languages, Literature and Linguistics. She also studied at London Business School in the UK, where she gained a Master of Business Administration in 2005.

Ms. Riley is a member of the Supervisory Board of The Clearing House Payments Company LLC.

She is Chief Executive Officer of DB USA Corporation.

Rebecca Short

Year of birth: 1974
First appointed: 2021
Term expires: 2024

Rebecca Short became a member of the Management Board on May 1, 2021. She is Chief Transformation Officer and the Management Board member responsible for Transformation and Global Procurement. She was responsible for the Capital Release Unit until January 31, 2023 and continues to retain oversight for the remaining activities in this regard.

She previously spent almost six years within Finance as Head of Group Planning & Performance Management.

She joined Deutsche Bank on its graduate program in Auckland in 1998. She moved to London in 2000 with Credit Risk Management, where she spent 12 years, formerly as European Head of Corporates. She then set up a new Risk-wide team, Strategic Risk Analysis & Reporting in 2012 before moving to a senior central management role in Audit in 2013, where she spent two years.

She has a BCom (Honours) degree in Finance & Accounting from the University of Otago, Dunedin, New Zealand.

Ms. Short does not have any external directorships subject to disclosure.

Professor Dr. Stefan Simon

Year of birth: 1969
First appointed: 2020
Term expires: 2026

Professor Dr. Stefan Simon became a member of the Management Board on August 1, 2020. He is Chief Administrative Officer (CAO) and is responsible for Government and Regulatory Affairs as well as for Legal and Governance. Additionally, he is responsible for Compliance, Anti-Financial-Crime (AFC) and the Business Selection and Conflicts Office, as well as for Controls Testing & Assurance.

Professor Dr. Simon joined Deutsche Bank on August 1, 2019. He was a member of the Supervisory Board from August 2016 until July 2019 and was Chairman of its Integrity Committee. He is a lawyer and tax consultant and between 1997 and 2016 worked at the law firm Flick Gocke Schaumburg, where he became a partner in 2002. Since 2008 he has also been an Honorary Professor of the University of Cologne.

He studied law at the University of Cologne and received his doctorate there in 1998.

Professor Dr. Simon is Chairman of the Advisory Council of Leop. Krawinkel GmbH & Co. KG.

Olivier Vigneron

Year of birth: 1971

First appointed: 2022

Term expires: 2025

Olivier Vigneron became a member of the Management Board on May 20, 2022. He is Chief Risk Officer responsible for the functions managing Credit Risk, Market Risk and Liquidity Risk as well as for other Risk-Infrastructure units.

Mr. Vigneron re-joined Deutsche Bank on March 1, 2022. From January 2020 until re-joining Deutsche Bank in 2022, Olivier Vigneron was Chief Risk Officer of Natixis, where he also served on the Senior Management Committee. From 2008 to 2020, he worked at J.P. Morgan, where he served as Chief Risk Officer for Europe, Middle East and Africa and Firmwide Risk Executive for Market Risk. Prior to this, he worked for BNP Paribas, UniCredit, and Goldman Sachs. Between 2002 and 2005 he worked in Structured Credit Trading for Deutsche Bank in London.

He has also served on the Supervisory Board of J.P. Morgan Germany and on the board of Natixis Assurances.

Olivier Vigneron studied at the Lycée Louis-le-Grand in Paris and holds a Diplôme d'Ingénieur (degree in Engineering) from France's École Polytechnique. He also holds a PhD in Economics from the University of Chicago.

Mr. Vigneron does not have any external directorships subject to disclosure.

Supervisory Board

The Supervisory Board of Deutsche Bank AG appoints and dismisses the members of the Management Board, supervises and advises the Management Board and is directly involved in decisions of fundamental importance to the bank. Supervision and advice also include in particular, sustainability issues. The Supervisory Board works together closely with the Management Board in a cooperative relationship of trust and for the benefit of the company. The internal organization of the Supervisory Board and its committees as well as the requirements for its members are subject to specific supervisory requirements that further supplement the corporate-law regulations concerning corporate governance. Such requirements are founded on, among other things, the German Banking Act (Kreditwesengesetz), the Remuneration Ordinance for Institutions (Institutsvergütungsverordnung), the guidelines of the European Banking Authority (EBA) and European Securities and Markets Authority (ESMA) and the administrative practices of the European Central Bank as our prudential supervisory authority. In individual cases, these may diverge from the recommendations of the German Corporate Governance Code (GCGC) for listed companies. The tasks of the Supervisory Board's committees, the basic principles for the meeting preparations and follow-ups, as well as general rules for the internal procedures of the Supervisory Board including its committees are set out in the Terms of Reference for the Supervisory Board and for its committees. The current versions are published on the Deutsche Bank website (www.db.com/ir/en/documents.htm). The number of meetings held during the financial year, along with a specification of the meeting conducted per telephone, through video conference and with physical attendance, is specified in the Report of the Supervisory Board. In addition, the representatives of the employees and the representatives of the shareholders regularly conduct preliminary discussions separately.

Together with the Management Board, the Supervisory Board arranges for a long-term succession planning: The Nomination Committee supports the Chairman's Committee and the Supervisory Board in identifying candidates to fill a position on the bank's Management Board. In doing so, the Committee prepares a position description with a candidate profile and states the expected time commitment. Suitable candidates are identified, in some cases in collaboration with external recruiting consultants, and structured interviews are conducted. Besides this succession planning with external candidates, the Management Board and Supervisory Board maintain a list of internal candidates. The Nomination Committee and Supervisory Board regularly receive reports from the Management Board on internal candidates for succession planning and the process from the perspective of the Management Board. For the selection of suitable candidates, external and internal, the Nomination Committee takes into account the balance and diversity of the knowledge, skills and experience of all members of the Management Board. It also seeks to foster diversity on the Management Board, for example, with regard to gender, nationality and age. The Supervisory Board ensures compliance with the legally required minimum gender participation pursuant to Section 76 (3a) of the Stock Corporation Act (AktG). In 2017, based on the legal regulation applicable at the time under Section 111 (5) of the Stock Corporation Act (AktG), the Supervisory Board had set the minimum target of at least 20% women on the Management Board by June 30, 2022. This target was met, as two women are members of the Management Board: Christiana Riley and Rebecca Short. Building on the work of the Nomination Committee, the Chairman's Committee submits a recommendation for the Supervisory Board's resolution. Based on this, the Supervisory Board decides on the appointment of Management Board members. The first appointment period is for a maximum of three years. Management Board members can be reappointed for one or several terms of office, which may be for a maximum of five years pursuant to the law, whereby at Deutsche Bank such reappointments should generally also be for a maximum of three years. Besides proposals for the appointment of members of the Management Board, the Chairman's Committee also submits proposals for the dismissal of Management Board members, which the Supervisory Board decides on.

Based on proposals of the Compensation Control Committee, the Supervisory Board determines the total compensation of the individual members of the Management Board and also regularly reviews and resolves on the compensation system for the Management Board.

The Supervisory Board receives reports from the Management Board at least within the scope prescribed by law or administrative guidelines, in particular on all issues of relevance for the Group concerning strategy, intended business policy, planning, business development, risk situation, risk management, staff development, reputation and compliance. Furthermore, Group Audit informs the Audit Committee of any deficiencies identified regularly and – in the case of severe deficiencies – without undue delay. The Chairman of the Supervisory Board is informed accordingly of any serious findings relating to the members of the Management Board. The Supervisory Board and Management Board adopted an Information Regime, a general engagement (interaction) protocol and a specific engagement (interaction) protocol for regulatory topics. These regulate not only the reporting to the Supervisory Board, but also, among other things the Supervisory Board's enquiries and requests for information from employees of the company as well as the exchange of information in connection with preparations for the meetings and between the meetings.

The Chairman of the Supervisory Board plays a crucial role in the proper functioning of the Supervisory Board and has a leadership role in this. He can issue internal guidelines and principles concerning the Supervisory Board's internal organization and communications, the coordination of the work within the Supervisory Board and the Supervisory Board's interaction with the Management Board. Between meetings, the Chairman of the Supervisory Board and, to the extent expedient, the chairpersons of the Supervisory Board committees maintain regular contact with the members of the Management Board, especially with the Chairperson of the Management Board, and deliberate with them, among other things, on issues of Deutsche Bank Group's strategy, planning, the development of its business, risk situation, risk management, risk controlling, governance, compliance, compensation systems, IT, data and digitalization as well as material litigation cases. The Chairman of the Supervisory Board and – within their respective functional responsibility – the chairpersons of the Supervisory Board committees are informed without delay by the Chairman of the Management Board or by the respectively responsible Management Board member about important events of material significance for the assessment of the situation, development and management of Deutsche Bank Group. The Chairman of the Supervisory Board engages in investor discussions on Supervisory Board-related topics when necessary and regularly informs the Supervisory Board of the substance of such discussions. These also cover Environmental, Social and Governance (ESG) topics. The Chairperson of the Audit Committee furthermore conducts regular discussions with the auditor outside the meetings.

The types of business that require the approval of the Supervisory Board to be transacted are specified in the Articles of Association of Deutsche Bank AG. Furthermore, the Supervisory Board may specify additional transactions that require its approval. The Supervisory Board meets regularly also without the Management Board. After due consideration and insofar as materially appropriate, the Supervisory Board, or any of its committees, may, in order to perform their tasks, consult auditors, legal advisors and other internal or external advisors. In performing their tasks, the Chairman of the Supervisory Board, the chairpersons of the committees and the Supervisory Board members are supported by the Office of the Supervisory Board, which is independent of the Management Board.

At several meetings, the Nomination Committee and Supervisory Board addressed the assessment of the Supervisory Board which is to be conducted at least annually as prescribed by law pursuant to Section 25d of the German Banking Act (KWG), and which is also the self-assessment of the Supervisory Board pursuant to Section D.12 of the German Corporate Governance Code (GCGC). The concrete implementation of and the schedule for the assessment were deliberated on and set out at the meetings of the Nomination Committee on July 26, 2022, and October 25, 2022. Services of an external advisor were not mandated in this context. The assessment was performed essentially on the basis of extensive questionnaires regarding the work of the Supervisory Board, of the Supervisory Board committees and of the Management Board, individual interviews conducted by members of the Nomination Committee with the members of the Management Board, and an assessment of the individual members of both the Management Board and Supervisory Board. The final discussion and approval of the results of the assessment took place at the Supervisory Board meeting in plenum on February 1, 2023, and the results were set out in a written final report. The Supervisory Board continues to hold the opinion that the Supervisory Board and Management Board have achieved a high standard and that there are no reservations, in particular, regarding the professional qualifications, personal reliability and time availability of the members of the Management Board and of the Supervisory Board.

Members of the Supervisory Board

The Supervisory Board has 20 members. In accordance with the German Co-Determination Act (Mitbestimmungsgesetz), it comprises an equal number of shareholder representatives and employee representatives.

In accordance with the Articles of Association, the members of the Supervisory Board are elected for the period until the conclusion of the General Meeting which adopts the resolutions concerning the ratification of the acts of management for the fourth financial year following the beginning of the term of office. For the election of shareholder representatives, the General Meeting may establish that the terms of office of individual members may begin or end on differing dates. In accordance with the Terms of Reference for the Supervisory Board since July 2020, shareholder representatives are proposed to the General Meeting for election for a maximum of approximately four years, i.e. until the conclusion of the General Meeting which adopts the resolutions concerning the ratification of the acts of management for the third financial year following the beginning of the term of office, whereby the financial year in which the term of office begins is not taken into account.

The following table shows information on the current members of our Supervisory Board.

Member	Principal occupation	Supervisory board memberships and other directorships
Alexander Wynaendts Year of birth: 1960 First elected: May 19, 2022 Term expires: 2026	Chairman of the Supervisory Board, Deutsche Bank AG	Air France-KLM Group S.A. ² (Member of the Board of Directors); Uber Technologies, Inc. ² (Member of the Board of Directors); Puissance Holding B.V. (Non-Executive Director, Chairman)
Ludwig Blomeyer-Bartenstein¹ Year of birth: 1957 First elected: May 24, 2018 Term expires: 2023	Spokesperson of the Management Bremen, Deutsche Bank AG	Frowein & Co. Beteiligungs AG; Bürgschaftsbank Bremen GmbH (Member of the Board of Directors) (until December 2022)
Mayree Clark Year of birth: 1957 First elected: May 24, 2018 Term expires: 2023	Supervisory Board member	Ally Financial, Inc. ² (Member of the Board of Directors); Allvue Systems Holdings, Inc. (Member of the Board of Directors)
Jan Duscheck¹ Year of birth: 1984 Appointed by the court: August 2, 2016 Term expires: 2023	Head of National Working Group Banking, trade union ver.di (Vereinte Dienstleistungsgewerkschaft)	No memberships or directorships subject to disclosure
Manja Eifert¹ Year of birth: 1971 Appointed by the court: April 7, 2022 Term expires: 2023	Staff Council member	No memberships or directorships subject to disclosure
Sigmar Gabriel Year of birth: 1959 Appointed by the court: March 11, 2020 Term expires: 2025	Former German Federal Government Minister	GP Günter Papenburg AG (until April 2022); Siemens Energy AG ² ; ThyssenKrupp Steel Europe AG (Chairman of the Supervisory Board) (since April 2022)
Timo Heider¹ Year of birth: 1975 First elected: May 23, 2013 Term expires: 2023	Staff Council member	BHW Bausparkasse AG ³ (Deputy Chairman); PCC Services GmbH der Deutschen Bank ³ (Deputy Chairman); Pensionskasse der BHW Bausparkasse AG VvaG ³ (Deputy Chairman)
Martina Klee¹ Year of birth: 1962 First elected: May 29, 2008 Term expires: 2023	Staff Council member	Sterbekasse für die Angestellten der Deutsche Bank-Gruppe VvaG ³
Gabriele Platscher¹ Year of birth: 1957 First elected: June 10, 2003 Term expires: 2023	Bank employee	BVV Versicherungsverein des Bankgewerbes a.G. (Deputy Chairperson) (until July 2022); BVV Versorgungskasse des Bankgewerbes e.V. (Deputy Chairperson) (until July 2022); BVV Pensionsfonds des Bankgewerbes AG (Deputy Chairperson) (until July 2022)

Detlef Polaschek¹ Year of birth: 1960 First elected: May 24, 2018 Term expires: 2023	Deputy Chairman of the Supervisory Board of Deutsche Bank AG; Staff Council member	No memberships or directorships subject to disclosure
Bernd Rose¹ Year of birth: 1967 First elected: May 23, 2013 Term expires: 2023	Staff Council member	Postbank Filialvertrieb AG ³ ; ver.di Vermögensverwaltungsgesellschaft m.b.H. (Deputy Chairperson)
Yngve Slyngstad Year of birth: 1962 First elected: May 19, 2022 Term expires: 2026	Chief Executive Officer of Aker Asset Management AS	No memberships or directorships subject to disclosure
John Alexander Thain Year of birth: 1955 First elected: May 24, 2018 Term expires: 2023	Supervisory Board member	Uber Technologies, Inc. ² (Member of the Board of Directors); Aperture Investors LLC (Member of the Board of Directors); Pine Island Capital Partners LLC (Chairman); Pine Island Acquisition Corp. ² (Chairman of the Board of Directors) (until October 2022)
Michele Trogni Year of birth: 1965 First elected: May 24, 2018 Term expires: 2023	Operating Partner Eldridge	Zinnia Corporate Holdings LLC (formerly SE2 LLC) (Chief Executive Officer since May 2022 and Chairperson of the Board of Directors)
Dr. Dagmar Valcárcel Year of birth: 1966 Appointed by the court: August 1, 2019 Term expires: 2025	Supervisory Board member	amedes Holding GmbH; Antin Infrastructure Partners S.A. ² (Member of the Board of Directors)
Stefan Viertel¹ Year of birth: 1964 Succession as substitute member: January 1, 2021 ⁴ Term expires: 2023	Staff Council member	No memberships or directorships subject to disclosure
Dr. Theodor Weimer Year of birth: 1959 First elected: May 20, 2020 Term expires: 2025	Chief Executive Officer, Deutsche Börse AG	Knorr Bremse AG ²
Frank Werneke¹ Year of birth: 1967 Appointed by the court: November 25, 2021 Term expires: 2023	Chairman of the trade union ver.di (Vereinte Dienstleistungsgewerkschaft)	ZDF Studios GmbH (formerly ZDF Enterprises GmbH); Member of the Television Council of the Zweites Deutsches Fernsehen (ZDF); ver.di Vermögensgesellschaft m.b.H.
Professor Dr. Norbert Winkeljohann Year of birth: 1957 First elected: August 1, 2018 Term expires: 2023	Deputy Chairman of the Supervisory Board of Deutsche Bank AG; Self-Employed Corporate Consultant Norbert Winkeljohann Advisory & Investment	Bayer AG ² (Chairman); Georgsmarienhütte Holding GmbH; Sievert SE (Chairman); Bohnenkamp AG (Chairman)
Frank Witter Year of birth: 1959 First elected: May 27, 2021 Term expires: 2025	Supervisory Board member	Traton SE ² ; VfL Wolfsburg-Fußball GmbH (Chairman); CGI Inc. ² (Member of the Board of Directors)

¹ Employee representatives

² Listed company

³ Group-internal mandate

⁴ Mr. Viertel already was a member of the Supervisory Board from August 1, 2010 to May 23, 2013.

Objectives for the composition of the Supervisory Board, Profile of Requirements, diversity concept and status of implementation

The composition of the Supervisory Board should ensure the effective and qualified control of and advice for the Management Board of an internationally operating, broadly positioned bank. In this connection, its members as a whole must possess the knowledge, abilities and expert experience to properly complete its tasks, and the members in their entirety of the Supervisory Board and the Audit Committee must be familiar with the banking sector. Attention should be placed, in particular, on the integrity, personality, willingness to perform, professionalism and independence of the individuals proposed for election. Furthermore, the members must be able to devote sufficient time to performing their mandates. The objective is for the Supervisory Board as a whole to possess all of the knowledge and experience considered to be essential while taking into account the activities of Deutsche Bank Group, also with regard to the observance of the relevant bank supervisory regulations.

At its meeting on December 15, 2022, the Supervisory Board discussed and approved a restructuring of its Profile of Requirements in order to be able to report on its skills and expertise in a qualifications matrix. The Supervisory Board specified general fields of expertise and expanded fields of expertise.

General fields of expertise:

Ideally, every member of the Supervisory Board possesses these individual qualifications.

- Understanding of commercial business issues
- Analytical and strategic mindset
- Understanding of the German corporate governance system, and – as a result – an understanding of a Supervisory Board member's responsibilities
- Understanding of the business model and the structure of Deutsche Bank AG
- Basic understanding of the financial services sector, e. g. (i) knowledge in the areas of banking, financial services, financial markets, financial industry, including the bank's home market as well as Europe and the bank's key markets outside Europe, and (ii) knowledge of the relevant clients for the bank, the market's expectations and the operational environment.

The fulfillment of these fields of expertise is reported on in summary in the qualification matrix in the line "General fields of expertise".

Expanded fields of expertise:

These fields of expertise refer to the Supervisory Board in its entirety (collective suitability). The Supervisory Board, as a whole, must have an understanding of the specified fields of expertise that is appropriate for the size and complexity of Deutsche Bank AG. They are derived from the bank's business model and from specific laws and regulations that apply to the bank. The fields of expertise are:

Accounting, including sustainability reporting:

- Accounting (International Financial Reporting Standards (IFRS) and German Commercial Code (HGB)) and auditing of annual financial statements
- Taxation

Regulatory framework and legal requirements:

- Understanding of the key legal framework conditions in the countries in which the company has its main operations
- Understanding of the key relevant legal systems for the bank
- Experience in the executive management / supervisory board of large enterprises
- Regulatory framework and legal requirements, in particular, knowledge of the legal systems relevant for the bank
- Knowledge of the social, political and regulatory expectations in the home market

Human capital, compensation and corporate culture:

- Human resources and staff management
- Compensation and compensation systems
- Selection procedure for management body members and assessment of their suitability
- Corporate culture

Risk management:

- Risk management (investigation, assessment, mitigation, management and control of financial and non-financial risks, capital and liquidity management, shareholdings)
- Combating money laundering and prevention of financial crime and the financing of terrorism

Information technology, data and digitalization:

- Digitalization, including digital banking
- Data, including data governance
- Information technology (IT), IT systems and IT security, including cyber risks

Strategy, transformation and Environmental, Social and Governance (ESG) issues:

- Strategic planning of business models and risk strategies as well as their implementation
- Climate and other environmental aspects
- Knowledge of social and political expectations (in particular in the home market) and their impacts on corporate social responsibility
- Company's purpose

Organizational structure and control of a financial institution

- Governance
- Management of a large, international regulated company
- Internal organization of the bank
- Internal audit
- Compliance and internal controls

In order to adequately reflect the bank's business model, the Supervisory Board shall demonstrate not only these professional qualifications but also qualifications and experience in the various client segments and different sales markets.

Client segments

- Private Banking and Wealth Management
- Corporate Banking
- Investment Banking
- Asset Management

Regional expertise

- Germany
- Europe
- Americas
- Asia-Pacific (APAC)

The suitability of each individual member to perform their mandate is assessed, determined and continuously monitored both internally and externally by the Nomination Committee and the Supervisory Board as well as by the regulatory authorities. The suitability assessment covers the expertise, reliability and time available of the individual members. In addition, there is an assessment of the knowledge, skills and experience of the Supervisory Board in its entirety that are necessary for it to perform its control function (collective suitability). Passing the suitability assessment of the European Central Bank (ECB) and the continual suitability of the Supervisory Board member during the entire mandate with Deutsche Bank AG are mandatory regulatory prerequisites for the performance of his or her work.

The Supervisory Board believes that it complies with the specified concrete objectives regarding its composition and the Profile of Requirements – as shown in the following qualifications matrix. The members of the Supervisory Board as a whole possess the knowledge, ability and expert experience to properly complete their tasks.

The Supervisory Board shall be composed such that the number of independent members among the shareholder representatives will be at least six. The matrix also provides information on this. All members act with independence of mind, i.e. all members of the Supervisory Board engage actively in their duties and are able to make their own sound, objective and independent decisions and judgements when performing their functions and responsibilities. In the preceding financial year, there were no former members of the Management Board on the Supervisory Board.

		Alexander Wynaendts	Ludwig Blomeyer-Bartenstein	Mayree Clark	Jan Duschek	Manja Eifert	Sigmar Gabriel	Timo Heider	Martina Klee	Gabriele Platscher	Detlef Polaschek	Bernd Rose	Yngve Slyngstad	John Alexander Thain	Michele Trogni	Dr. Dagmar Valcárcel	Stefan Viertel	Dr. Theodor Weimer	Frank Werneke	Prof. Dr. Norbert Winkeljohann	Frank Witter
Member-ship	No Overboarding*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Independent **	✓	ER	✓	ER	ER	✓	ER	ER	ER	ER	ER	✓	✓	✓	✓	ER	✓	ER	✓	✓
Professional expertise	General fields of expertise	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Accounting and reporting, incl. sustainability reporting	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Audit Committee Financial Experts ***	◆														◆		◆		◆	◆
	Expertise in the area of accounting ***	◆														◆		◆		◆	◆
	Expertise in the area of auditing ***	◆														◆		◆		◆	◆
	Regulatory framework and Legal requirements	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓
	Human Capital, Compensation and Corporate Culture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Compensation Control Committee Compensation Experts***	◆														◆				◆	
	Risk Management	✓	✓	✓	✓		✓						✓	✓	✓	✓	✓	✓		✓	✓
	Information technology, data and digitalization	✓		✓	✓				✓			✓	✓	✓	✓			✓	✓		
	Strategy, Transformation and ESG	✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Organizational structure and control of a financial institution	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
Client/business expertise	Private Banking and Wealth Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓
	Corporate Banking	✓	✓			✓				✓	✓			✓	✓	✓	✓	✓		✓	✓
	Investment Banking	✓	✓	✓									✓	✓	✓	✓	✓	✓			✓
	Asset Management	✓		✓									✓	✓		✓	✓	✓			
Regional Expertise	Germany		✓		✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
	Europe	✓	✓	✓			✓						✓	✓	✓	✓	✓	✓	✓	✓	✓
	Americas	✓		✓			✓							✓	✓	✓				✓	✓
	APAC	✓		✓			✓						✓	✓	✓	✓				✓	✓

✓ Profound and professional knowledge / expert

◆ Regulatory expert / expertise required by law and/or supervisory regulation

ER Employees representatives

* Definition of no overboarding: All Supervisory Board members hold an admissible number of board directorships in various companies in addition to Deutsche Bank AG. Overboarding, i.e. holding an inadmissible number of board directorships in different companies, is determined on the basis of the statutory regulation in Section 25d (3) of the German Banking Act (KWG). A Supervisory Board member may concurrently be a member of the supervisory body of a maximum of five companies (including Deutsche Bank AG). If a Supervisory Board member is also an executive director of a company, this Supervisory Board member may concurrently be a member of the supervisory body of a maximum of three companies (including Deutsche Bank AG). The decisive factors for determining if this is the case are the supervisory authority's regulatory requirements in consideration of the local laws. Compliance with this statutory regulation is continually monitored by the regulatory authorities. In the event of directorship overboarding, the supervisory authorities may require that Deutsche Bank AG revoke a Supervisory Board member's appointment and prohibit this Supervisory Board member from performing his or her work.

** Definition of independence: A Supervisory Board member is independent when there are no personal or business relations with Deutsche Bank or its Management Board that may cause a substantial and not merely temporary conflict of interest. Back in 2017, the Supervisory Board issued guidelines for the consistent assessment of the independence of its members, and these also take into account the regulatory requirements on independence. The bank has no controlling shareholder at present.

*** Definition of experts given in the section "Auditing and Controlling" in this report

There is a regular maximum age limit of 70. In well-founded, individual cases, a Supervisory Board member may be elected or appointed for a period that extends at the latest until the end of the fourth Annual General Meeting that takes place after he or she has reached the age of 70. This age limit was taken into account in the election proposals to the General Meeting and shall also be taken into account for the next Supervisory Board elections or subsequent appointments for Supervisory Board positions that become vacant.

For shareholder representatives on the Supervisory Board elected or appointed since July 2020, the length of Supervisory Board membership shall not, as a rule, exceed 12 years.

The Supervisory Board respects diversity when proposing its members for appointment. In light of the international operations of Deutsche Bank, care should be taken that the Supervisory Board has an appropriate number of members with long-term international experience. Currently, the professional careers or private lives of six members of the Supervisory Board are centered outside Germany. Furthermore, all of the shareholder representatives on the Supervisory Board have many years of international experience from their current or former activities, for example, as management board members or chief executive officers or in a comparable executive function of corporations or organizations with international operations. In these two ways, the Supervisory Board believes the international activities of the company are sufficiently taken into account. The objective is to retain the currently existing international profile.

Special importance has already been attached to an appropriate consideration of women in the selection process since the Supervisory Board elections in 2008. For the election proposals to the General Meeting, the Supervisory Board takes into account the recommendations of the Nomination Committee and the legal requirements according to which the Supervisory Board shall be composed of at least 30 % women and at least 30 % men. In reviewing potential candidates for a new election or subsequent appointments to Supervisory Board positions that have become vacant, qualified women are included in the selection process and appropriately considered in the election proposals. At the end of the financial year, three women and seven men were members of the Supervisory Board on both the employee representatives' side and shareholder representatives' side. The statutory minimum quota of 30% has thus been fulfilled for many years now.

The age structure is diverse, ranging from 38 to 67 years of age at the end of the financial year and spanning three generations, according to the general definition of the term. The length of membership on the Supervisory Board of Deutsche Bank ranged from under one year to around 20 years at the end of the financial year.

The diverse range of the members' educational and professional backgrounds includes banking, business administration, economics, auditing, law, German studies, political science, electrical engineering and healthcare. The resumes of the members of the Supervisory Board are published on Deutsche Bank's website (www.db.com/ir/en/supervisory-board.htm).

The members of the Supervisory Board do not exercise functions on a management body of, or perform advisory duties at, major competitors. Material conflicts of interest involving a member of the Supervisory Board that are not merely temporary will result in the termination of that member's Supervisory Board mandate. Members of the Supervisory Board may not, according to Section 25d of the German Banking Act (KWG), and shall not, according to the recommendations under C.4 and C.5 of the German Corporate Governance Code (GCGC), hold more than the allowed number of supervisory board mandates or mandates in supervisory bodies of companies which have similar requirements. These requirements were met in the preceding financial year.

Some members of the Supervisory Board are, or were last year, in high-ranking positions at other companies that Deutsche Bank has business relations with. Business transactions with these companies were conducted under the same conditions as those between unrelated third parties. In the opinion of the Management Board and the Supervisory Board, these transactions did not affect the independence of the Supervisory Board members involved.

Standing Committees

The Supervisory Board has established the following eight standing committees: Chairman's Committee, Nomination Committee, Audit Committee, Risk Committee, Regulatory Oversight Committee (former Integrity Committee), Compensation Control Committee, Strategy and Sustainability Committee (former Strategy Committee) and Technology, Data and Innovation Committee. To the extent required, the committees coordinate their work and consult each other on an ad hoc basis. The committee chairpersons report regularly to the Supervisory Board on the work of the committees. The Report of the Supervisory Board provides information on the concrete work of the committees over the preceding year. Please see below details relating to DB's Audit Committee and Compensation Control Committee, including the names of committee members and a summary of the terms of reference under which the committee operates.

Audit Committee: It supports the Supervisory Board in particular in monitoring the financial reporting process, and it can submit recommendations or suggestions to the Supervisory Board on ensuring the integrity of the financial reporting process. Furthermore, the Audit Committee supports the Supervisory Board in monitoring the effectiveness of the risk management system, particularly of the internal control system including sustainability-related issues and the internal audit system, the auditing of the financial statements, especially with regard to the auditor's independence and the additional services provided by the auditor, and the Management Board's prompt remediation – through suitable measures – of the deficiencies identified by the auditor and bank-internal control functions based on internal and external audits, in particular relating to weaknesses in risk controls, as well as non-compliance with policies, laws and regulatory requirements. The Committee is entitled to inspect all business documentation of the bank, including the business information stored on data carriers and sustainability-related data. The Audit Committee pre-reviews the annual and consolidated financial statements and management reports as well as the separate non-financial report and the separate consolidated non-financial report. The chairperson of the Audit Committee regularly discusses the progress of the audit with the auditor and report on this to the Committee. It discusses the audit reports with the auditor and prepares the decisions of the Supervisory Board on establishing the annual financial statements and the approval of the consolidated financial statements as well as the resolution proposal on the appropriation of distributable profit. The Audit Committee submits corresponding recommendations to the Supervisory Board. It also provides support to the Supervisory Board with regard to engaging any external assurances for the non-financial statement and the consolidated non-financial statement or for the separate non-financial report and separate consolidated non-financial report. It discusses important changes to the audit and accounting methods. The Audit Committee also discusses the half-year interim and each of the quarterly earnings reports and the reports on the limited review of the financial statements with the Management Board and the auditor prior to their publication. Furthermore, the Audit Committee submits proposals to the Supervisory Board for the appointment of the auditor and prepares the proposal of the Supervisory Board to the General Meeting for the election of the auditor. The Audit Committee advises the Supervisory Board on issuing the audit mandate to the auditor elected by the General Meeting, submits proposals to the Supervisory Board for the auditor's remuneration and can specify areas of focus for the audit. It supports the Supervisory Board in monitoring the independence, qualifications and efficiency of the auditor as well as the rotation of the members of the audit team. The Audit Committee discusses with the auditor the audit risk assessment, the audit strategy and audit planning, as well as the results. It monitors and assesses the quality of the audit. Mandates for non-audit-related services given to the auditor or to companies to which the auditor is related in legal, economic or personnel terms need the prior consent of the Audit Committee (in this context, see also the Principal Accountant Fees and Services section in this Corporate Governance Statement/Corporate Governance Report). The Audit Committee issues guidelines for the employment of staff – including former staff – of the auditor by the company. It also consults with the auditor on a regular basis with out the Management Board. It arranges to be informed regularly about the work done by Group Audit, the effectiveness of the internal audit system and in particular about its annual audit plan the focal areas of its auditing activity and on the results of its audits. The Audit Committee is responsible, in particular, for receiving and handling the quarterly, annual and ad hoc reports of Group Audit. The Management Board informs the Audit Committee about special audits, substantial complaints and other exceptional measures on the part of German and foreign bank regulatory authorities relating to the annual audit. The Committee regularly obtains reports on the receipt and handling of complaints from employees of the bank and its subsidiaries, from shareholders of Deutsche Bank AG and from third parties. In particular complaints concerning accounting, internal accounting controls, auditing and other financial reporting matters must be submitted to the Committee without undue delay. Reports concerning compliance matters and the prevention of money laundering are presented at the meetings of the Committee on a regular basis. The Chairman of the Audit Committee is entitled, in addition to the Chairman of the Supervisory Board, to obtain information directly from the Head of Compliance and the Anti-Money Laundering Officer. The Audit Committee is responsible for taking receipt of and handling the report by the Head of Compliance in accordance with Article 22 (2) c) of the Delegated Regulation (EU) 2017/565 in conjunction with section BT 1.2.2 of the Minimum Requirements for the Compliance Function (MaComp) as well as section AT 4.4.2 No 7 of the Minimum Requirements for Risk Management (MaRisk) (Compliance Reports) as well as the report by the Anti-Money Laundering Officer. These reports are usually issued every quarter, but at least once a year. Furthermore the committee is responsible for acknowledging communications about significant reductions in the budgets of Group Audit as well as the Compliance and Anti-Financial Crime infrastructure areas. Furthermore, every member of the Committee is entitled to obtain, through its Chairperson, information directly from the heads of the bank's departments that are responsible for the tasks that involve the Audit Committee. The Management Board must be informed without undue delay when information is obtained. With the prior consent of the Management Board, the Committee may obtain information in connection with its tasks from other senior executives of the

bank who report directly to the Management Board. The Committee Chairperson is to inform all Committee members of the information obtained.

The current members of the Audit Committee are Frank Witter (Chairman), Manja Eifert, Gabriele Platscher, Detlef Polaschek, Bernd Rose, Dr. Dagmar Valcárcel, Stefan Viertel, Dr. Theodor Weimer, Professor Dr. Norbert Winkeljohann and Alexander Wynaendts.

Compensation Control Committee: It supports the Supervisory Board in the appropriate structuring of the compensation systems for the members of the Management Board. It also monitors the appropriate structure of the compensation systems for the Management Board members and employees and, in particular, the appropriate structure of the compensation for the Head of the compliance function, for the Anti-Money Laundering Officer and for the employees who have a material influence on the bank's overall risk profile. Furthermore it reviews at least once a year the use and effectiveness of measures specifically available in the remuneration system in connection with breaches of authorities' regulations and the company's own in-house policies (consequence management). The Compensation Control Committee supports the Supervisory Board in monitoring the process to identify Group risk takers in accordance with Section 27 (2) sentence 1 of the Remuneration Ordinance for Institutions (InstitutsVergV) as well as the appropriate structure of the compensation systems for the company's employees. It monitors if the compensation systems of employees in control functions are in accordance with InstitutsVergV requirements. The Committee assesses the effects of the compensation systems on risk, capital and liquidity management, while ensuring that the compensation systems are aligned to the business strategy focused on the banks sustainable development, to the risk strategies derived from this and to the compensation strategies at the company and Group levels. It prepares the Supervisory Board's resolutions on the compensation of the Management Board, considering, in particular, the effects of the resolutions on the company's risks and risk management. The long-term interests of shareholders, investors and other stakeholders as well as the public interest are also taken into account. It also prepares the Supervisory Board's resolutions on setting the total amount of variable compensation for the members of the Management Board in accordance with Section 45 (2) sentence 1 No. 5a of the German Banking Act (KWG) in consideration of Section 7 of the Remuneration Ordinance for Institutions (InstitutsVergV) and on setting the appropriate compensation parameters, targets for contributions to performance, payment and deferral periods as well as the conditions for a full forfeiture or partial reduction of variable compensation. It also checks regularly, at least annually, whether the adopted specifications are still appropriate. A remediation plan shall be developed promptly for any identified deficiencies. Furthermore, it checks, as part of its support to the Supervisory Board in monitoring the appropriate structure of the compensation systems for employees, regularly, but at least annually, in particular, whether the total amount of variable compensation has been set in accordance with Section 45 (2) sentence 1 No. 5a of the German Banking Act (KWG) in consideration of Section 7 of the Remuneration Ordinance for Institutions (InstitutsVergV) and whether the specified principles to assess the compensation parameters, contributions to performance as well as the payment and deferral periods, including the conditions for a full forfeiture or partial reduction of the variable compensation, are appropriate. In addition, it supports the Supervisory Board in monitoring whether the internal controls and other relevant areas are properly involved in the structuring of the compensation systems. The Committee is authorized to obtain, via its Chairperson, information relating to the Committee tasks from the Head of Group Audit and from the heads of the organizational units responsible for structuring the compensation systems. Furthermore the committee supports the Supervisory Board in producing the proposals for resolutions on the structuring of variable and fixed compensation in accordance with section 25a (5) sentence 6 KWG.

The current members of the Compensation Control Committee are Professor Dr. Norbert Winkeljohann (Chairman), Detlef Polaschek, Bernd Rose, Dr. Dagmar Valcárcel, Frank Werneke and Alexander Wynaendts.

Please see below the current members of the remaining six committees. The tasks and further details of all standing committees are regulated in separate Terms of Reference. The current versions are available on the Deutsche Bank website (www.db.com/ir/en/documents.htm).

Chairman's Committee: Alexander Wynaendts (Chairman), Detlef Polaschek, Professor Dr. Norbert Winkeljohann

Nomination Committee: Alexander Wynaendts (Chairperson), Mayree Clark, Detlef Polaschek, Frank Werneke, Professor Dr. Norbert Winkeljohann

Risk Committee: Mayree Clark (Chairperson), Ludwig Blomeyer-Bartenstein, Jan Duscheck, Michele Trogni, Stefan Viertel, Professor Dr. Norbert Winkeljohann, Alexander Wynaendts

Regulatory Oversight Committee (formerly Integrity Committee): Dr. Dagmar Valcárcel (Chairperson), Ludwig Blomeyer-Bartenstein, Sigmar Gabriel, Timo Heider, Gabriele Platscher, Alexander Wynaendts

Strategy and Sustainability Committee (since December 16, 2022) (formerly Strategy Committee): John Alexander Thain (Chairman), Mayree Clark, Timo Heider, Detlef Polaschek, Michele Trogni, Stefan Viertel, Frank Werneke, Alexander Wynaendts

Technology, Data and Innovation Committee: Michele Trogni (Chairperson), Jan Duscheck, Martina Klee, Bernd Rose, Yngve Slyngstad, Alexander Wynaendts

Share Plans

For information on the employee share programs, please refer to the additional Note 33 "Employee Benefits" to the Consolidated Financial Statements.

Reporting and Transparency

Directors' Share Ownership

Management Board: For information on the share ownership of the Management Board, please refer to our detailed Compensation Report in the Management Report.

Supervisory Board: The members of our Supervisory Board held the following numbers of our shares and share awards under our employee share plans.

Members of the Supervisory Board	Number of shares	Number of share awards
Alexander Wynaendts	0	0
Ludwig Blomeyer-Bartenstein	5,490	4,735 ¹
Mayree Clark	109,444	0
Jan Duscheck	0	0
Manja Eifert	103	10
Sigmar Gabriel	0	0
Timo Heider	0	0
Martina Klee	2,781	10
Gabriele Platscher	1,684	10
Detlef Polaschek	1,934	10
Bernd Rose	0	0
Yngve Slyngstad	0	0
John Alexander Thain	100,000	0
Michele Trogni	15,000	0
Dr. Dagmar Valcárcel	0	0
Stefan Viertel	1,007	0
Dr. Theodor Weimer	108,000	0
Frank Werneke	0	0
Professor Dr. Norbert Winkeljohann	0	0
Frank Witter	0	0
Total	345,443	4,775

¹ Restricted Equity Awards. Mr. Blomeyer-Bartenstein has an entitlement linked to 4,735 shares through Restricted Equity Awards as part of his variable compensation. These become due for disbursement from 2023 to 2027.

As of February 10, 2023, the members of the Supervisory Board held 345,443 shares, which is less than 0.02 % of the shares issued as of the reporting day.

The "Number of share awards" column in the table lists share awards granted under the Global Share Purchase Plan to Supervisory Board members who are employees of Deutsche Bank ("Matching Awards"), which are scheduled to be delivered to them on November 1, 2023, as well as Restricted Equity Awards (deferred share awards), which are granted to employees with deferred variable compensation. The Restricted Equity Awards are indicated with a footnote in the table, and further details on them as a compensation instrument are provided in the "Employee compensation report".

As described in the "Management Report: Compensation Report: Compensation system for Supervisory Board members", 25 % of each member's compensation for services as a member of the Supervisory Board for a given prior year is, rather than being paid in cash, converted into notional shares of Deutsche Bank AG in February of the following year. The cash value of the notional shares is paid to the members in February of the year following their departure from the Supervisory Board or the expiration of their term of office, based on the market price of the Deutsche Bank share near the payment date.

The Compensation Report on the preceding financial year and the auditor's report pursuant to Section 162 of the German Stock Corporation Act (AktG), the currently applicable compensation system pursuant to Section 87a (1) and (2) sentence 1 AktG as well as the last resolution on compensation pursuant to Section 113 (3) AktG are available from the bank's website www.db.com (under the Investor Relations headings "Reports and Events", "Annual Reports").

Related Party Transactions

For information on related party transactions please refer to Note 36 "Related party transactions".

Auditing and Controlling

Audit Committee Financial Expert

The Supervisory Board determined that the following members of the Audit Committee are “Audit Committee Financial Experts”, as such term is defined by the implementation rules of the U.S. Securities and Exchange Commission issued pursuant to Section 407 of the Sarbanes-Oxley Act of 2002: Dr. Dagmar Valcárcel, Dr. Theodor Weimer, Professor Dr. Norbert Winkeljohann, Frank Witter and Alexander Wynaendts. These Audit Committee Financial Experts are “independent” of the bank, as defined in Rule 10A-3 under the U.S. Securities Exchange Act of 1934.

Furthermore, the Supervisory Board determined in accordance with Sections 107 (4) and 100 (5) of the Stock Corporation Act (AktG) and Section 25d (9) of the German Banking Act (KWG) that Dr. Dagmar Valcárcel, Dr. Theodor Weimer, Professor Dr. Norbert Winkeljohann, Frank Witter and Alexander Wynaendts have expert knowledge in financial accounting and the auditing of financial statements.

Dr. Dagmar Valcárcel has expertise in the areas of accounting and auditing through her many years of experience as Chair of the Management Board of Andbank Asset Management Luxembourg S.A. and Barclays Vida y Pensiones, S.A.U. and through her current work as member of the Board of Directors of Antin Infrastructure Partners S.A. Dr. Theodor Weimer has expertise in the areas of accounting and auditing through his many years of experience as Chief Executive Officer of HypoVereinsbank / UniCredit AG and as a former member of the Audit Committee of ERGO Gruppe AG as well as through his current work as Chairman of the Executive Board of Deutsche Börse AG. Professor Dr. Norbert Winkeljohann has expertise in the areas of accounting and auditing through his education and training as an auditor and his many years of experience as an auditor at various auditing firms and as Chairman of the Management Board of PwC Europe SE. Frank Witter has expertise in the areas of accounting and auditing through his many years of experience as Chief Financial Officer of Volkswagen AG and as Chairman of the Board of Management of Volkswagen Financial Services AG. Alexander Wynaendts has expertise in the areas of accounting and auditing through his many years of experience as Chief Executive Officer and Chairman of the Management and Executive Boards of Aegon N.V.

Compensation Control Committee Compensation Expert

Pursuant to Section 25d (12) of the German Banking Act (KWG), at least one member of the Compensation Control Committee must have sufficient expertise and professional experience in the field of risk management and risk controlling, in particular, with regard to the mechanisms to align compensation systems to the company's overall risk appetite and strategy and the bank's capital base. Based on the recommendation of the Compensation Control Committee, the Supervisory Board resolved to specify by name Dr. Dagmar Valcárcel, Alexander Wynaendts and Professor Dr. Norbert Winkeljohann as Compensation Control Committee Compensation Experts. All of them have expertise and professional experience in the field of risk management and risk controlling, in particular with regard to mechanisms to align the compensation systems to the company's overall risk appetite and strategy and its capital base. They therefore fulfill the requirements of Section 25d (12) of the German Banking Act (KWG).

Dr Valcárcel has comprehensive legal experience with compensation frameworks, including reputational risks, from her time as, among other things, Head of the Legal Department of Barclays PLC for Western Europe.

Based on their years of experience as Management Board Chairman and/or Chief Executive Officer, Alexander Wynaendts and Professor Dr. Norbert Winkeljohann have sufficient expertise and professional experience in the area of risk management and risk controlling.

Values and leadership principles of Deutsche Bank AG and Deutsche Bank Group

Deutsche Bank Group Code of Conduct and Code of Ethics for Senior Financial Officers

Deutsche Bank Group's Code of Conduct sets out Deutsche Bank's purpose, values and beliefs and minimum standards of conduct that we expect all members of our Management Board and employees to follow. These values and standards govern employee interactions with our clients, competitors, business partners, government and regulatory authorities, and shareholders, as well as with other employees. In addition, the Code forms the cornerstone of our policies, which provide guidance on compliance with applicable laws and regulations.

In accordance with Section 406 of the Sarbanes-Oxley Act of 2002, the bank adopted a Code of Ethics for Senior Financial Officers of Deutsche Bank AG and Deutsche Bank Group with special obligations that apply to the "Senior Financial Officers", which currently consist of Deutsche Bank's Chairman of the Management Board and the Chief Financial Officer as well as certain other Senior Financial Officers. There were no amendments or waivers to this Code of Ethics in 2022.

The current versions of the Code of Conduct as well as the Code of Ethics for Senior Financial Officers of Deutsche Bank AG and Deutsche Bank Group are available from Deutsche Bank's website: www.db.com/ir/en/documents.htm.

Corporate Governance at Deutsche Bank AG and Deutsche Bank Group

Deutsche Bank established a Group Governance function to define, implement and monitor the corporate governance framework of Deutsche Bank AG and Deutsche Bank Group and to perform this governance function throughout the Group. Group Governance addresses corporate governance issues in Deutsche Bank AG and Deutsche Bank Group, while focusing closely on clear organizational structures aligned to the key elements of good corporate governance.

Deutsche Bank AG and Deutsche Bank Group are committed to ensuring a corporate governance framework in accordance with international standards and statutory provisions. In support of this objective, Deutsche Bank AG and Deutsche Bank Group have instituted clear corporate governance principles.

Further details on corporate governance are published on Deutsche Bank's website (www.db.com/ir/en/corporate-governance.htm).

Principal accountant fees and services

In accordance with German law, our principal accountant is appointed at our Annual General Meeting based on a recommendation of our Supervisory Board. The Audit Committee of our Supervisory Board prepares such a recommendation. Subsequent to the principal accountant's appointment, the Audit Committee awards the contract and in its sole authority approves the terms and scope of the audit and all audit engagement fees as well as monitors the principal accountant's independence. Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft ("EY") was our principal accountant for the 2021 and 2022 fiscal years, respectively.

The tables set forth below contain the aggregate fees billed for each of the last two fiscal years by EY in each of the following categories: (1) Audit fees, which are fees for professional services for the audit of our annual financial statements or services that are normally provided by the accountant in connection with statutory and regulatory filings or engagements for those fiscal years, (2) Audit-related fees, which are fees for assurance and related services that are reasonably related to the performance of the audit or review of our financial statements and are not reported as Audit fees, (3) Tax-related fees, which are fees for professional services rendered for tax compliance, tax consulting and tax planning, and (4) All other fees, which are fees for products and services other than Audit fees, Audit-related fees and Tax-related fees. These amounts include expenses and exclude Value Added Tax (VAT).

Fees billed by EY

Fee category in € m.	2022	2021
Audit fees	59	54
Audit-related fees	8	8
Tax-related fees	0	1
All other fees	1	1
Total fees	68	64

The Audit fees include fees for professional services for the audit of our annual financial statements and consolidated financial statements and do not include audit fees for DWS and its subsidiaries that are not audited by EY. The Audit-related fees include fees for other assurance services required by law or regulations, in particular for financial service specific attestation, for quarterly reviews, for spin-off audits and for merger audits, as well as fees for voluntary assurance services, like voluntary audits for internal management purposes and the issuance of comfort letters. Our Tax-related fees include fees for services relating to the preparation and review of tax returns and related compliance assistance and advice, tax consultation and advice relating to Group tax planning strategies and initiatives and assistance with assessing compliance with tax regulations.

Under SEC regulations, the principal accountant fees are required to be presented as follows: audit fees were € 61 million in 2022 compared to € 56 million in 2021, audit-related fees were € 6 million in 2022 compared to € 6 million in 2021, tax-related fees were € 0 million in 2022 compared to € 1 million in 2021, and all other fees were € 1 million in 2022 compared to € 1 million in 2021.

United States law and regulations, and our own policies, generally require that all engagements of our principal accountant be pre-approved by our Audit Committee or pursuant to policies and procedures adopted by it. Our Audit Committee has adopted the following policies and procedures for consideration and approval of requests to engage our principal accountant to perform non-audit services. Engagement requests must in the first instance be submitted to the Accounting Engagement Team. If the request relates to services that would impair the independence of our principal accountant, the request must be rejected. Our Audit Committee has given its pre-approval for specified assurance, financial advisory and tax services, provided the expected fees for any such service do not exceed € 1 million. If the engagement request relates to such specified pre-approved services, it may be approved by the Accounting Engagement Team and must thereafter be reported to the Audit Committee. If the engagement request relates neither to prohibited non-audit services nor to pre-approved non-audit services, it must be forwarded to the Audit Committee for consideration. In addition, to facilitate the consideration of engagement requests between its meetings, the Audit Committee has delegated approval authority to several of its members who are "independent" as defined by the Securities and Exchange Commission and the New York Stock Exchange. Such members are required to report any approvals made by them to the Audit Committee at its next meeting.

Additionally, United States law and regulations permit the pre-approval requirement to be waived with respect to engagements for non-audit services aggregating to no more than five percent of the total amount of revenues we paid to our principal accountant, if such engagements were not recognized by us at the time of engagement and were promptly brought to the attention of our Audit Committee or a designated member thereof and approved prior to the completion of the audit. In 2021 and 2022, the percentage of the total amount of revenues we paid to our principal accountant for non-audit services that was subject to such a waiver was less than 5 % for each year.

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Supplementary Information (Unaudited)

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Non-GAAP Financial Measures

This document and other documents the Group has published or may publish contain non-GAAP financial measures. Non-GAAP financial measures are measures of the Group's historical or future performance, financial position or cash flows that contain adjustments that exclude or include amounts that are included or excluded, as the case may be, from the most directly comparable measure calculated and presented in accordance with IFRS in the Group's financial statements.

Return on Equity Ratios

The Group reports a post-tax return on average shareholders' equity and a post-tax return on average tangible shareholders' equity, each of which is a non-GAAP financial measure.

The post-tax returns on average shareholders' equity and average tangible shareholders' equity are calculated as profit (loss) attributable to Deutsche Bank shareholders after profit (loss) attributable to additional equity components (AT1 coupon) as a percentage of average shareholders' equity and average tangible shareholders' equity, respectively.

Profit (loss) attributable to Deutsche Bank shareholders after AT1 coupon for the segments is a non-GAAP financial measure and is defined as profit (loss) excluding post-tax profit (loss) attributable to noncontrolling interests and after AT1 coupon, which are allocated to segments based on their allocated average tangible shareholders' equity. For the Group, it reflects the reported effective tax rate, which was (2)% for the full year 2022, 26% for 2021 and 39% for 2020. For the segments, the applied tax rate was 28% for all reported periods in 2022, 2021 and 2020.

At the Group level, tangible shareholders' equity is shareholders' equity as reported in the Consolidated Balance Sheet excluding goodwill and other intangible assets. Tangible shareholders' equity for the segments is calculated by deducting goodwill and other intangible assets from shareholders' equity as allocated to the segments. Shareholders' equity and tangible shareholders' equity are presented on an average basis.

The Group believes that a presentation of average tangible shareholders' equity makes comparisons to its competitors easier, and refers to this measure in the return on equity ratios presented by the Group. However, average tangible shareholders' equity is not a measure provided for in IFRS, and the Group's ratios based on this measure should not be compared to other companies' ratios without considering differences in the calculations.

The reconciliation of the aforementioned ratios is set forth in the table below:

	2022						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total
Profit (loss) before tax	2,051	3,487	1,979	598	(932)	(1,736)	5,447
Profit (loss)	1,477	2,510	1,425	431	(671)	382	5,554
Profit (loss) attributable to noncontrolling interests	0	0	0	0	0	134	134
Profit (loss) attributable to DB shareholders and additional equity components	1,477	2,510	1,425	431	(671)	248	5,420
Profit (loss) attributable to additional equity components	102	232	116	22	28	(0)	500
Profit (loss) attributable to Deutsche Bank shareholders	1,375	2,278	1,309	408	(699)	248	4,919
Average allocated shareholders' equity	11,901	26,032	13,584	5,459	3,018	115	60,108
Deduct: Average allocated goodwill and other intangible assets ¹	884	1,139	1,175	3,067	61	0	6,328
Average allocated tangible shareholders' equity	11,017	24,893	12,409	2,392	2,956	115	53,780
Post-tax return on average shareholders' equity	11.6 %	8.8 %	9.6 %	7.5 %	(23.2) %	N/M	8.2 %
Post-tax return on average tangible shareholders' equity	12.5 %	9.2 %	10.6 %	17.1 %	(23.7) %	N/M	9.1 %

¹ Goodwill and other intangible assets related to the share of DWS that is not held by Deutsche Bank are excluded since the first quarter of 2018

	2021						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total
Profit (loss) before tax	1,011	3,714	355	816	(1,364)	(1,014)	3,518
Profit (loss)	728	2,674	256	587	(982)	(668)	2,595
Profit (loss) attributable to noncontrolling interests	0	0	0	0	0	144	144
Profit (loss) attributable to DB shareholders and additional equity components	728	2,674	256	587	(982)	(812)	2,451
Profit (loss) attributable to additional equity components	81	195	97	16	37	(0)	426
Profit (loss) attributable to Deutsche Bank shareholders	647	2,479	159	571	(1,019)	(812)	2,025
Average allocated shareholders' equity	10,301	24,181	12,663	4,815	4,473	104	56,537
Deduct: Average allocated goodwill and other intangible assets ¹	721	1,087	1,256	2,889	96	0	6,049
Average allocated tangible shareholders' equity	9,580	23,094	11,408	1,926	4,377	104	50,489
Post-tax return on average shareholders' equity	6.3 %	10.3 %	1.3 %	11.9 %	(22.8) %	N/M	3.6 %
Post-tax return on average tangible shareholders' equity	6.8 %	10.7 %	1.4 %	29.7 %	(23.3) %	N/M	4.0 %

Prior year's comparatives aligned to presentation in the current year

¹ Goodwill and other intangible assets related to the share of DWS that is not held by Deutsche Bank are excluded since the first quarter of 2018

	2020						
in € m. (unless stated otherwise)	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total
Profit (loss) before tax	547	3,166	(108)	544	(2,200)	(947)	1,003
Profit (loss)	394	2,280	(78)	392	(1,584)	(792)	612
Profit (loss) attributable to noncontrolling interests	0	0	0	0	0	129	129
Profit (loss) attributable to DB shareholders and additional equity components	394	2,280	(78)	392	(1,584)	(921)	483
Profit (loss) attributable to additional equity components	72	169	79	14	48	(0)	382
Profit (loss) attributable to Deutsche Bank shareholders	322	2,111	(157)	378	(1,632)	(921)	101
Average allocated shareholders' equity	9,945	22,911	11,553	4,757	6,166	(23)	55,308
Deduct: Average allocated goodwill and other intangible assets ¹	603	1,133	1,255	2,993	142	(0)	6,127
Average allocated tangible shareholders' equity	9,341	21,777	10,298	1,764	6,024	(23)	49,182
Post-tax return on average shareholders' equity	3.2 %	9.2 %	(1.4) %	7.9 %	(26.5) %	N/M	0.2 %
Post-tax return on average tangible shareholders' equity	3.4 %	9.7 %	(1.5) %	21.4 %	(27.1) %	N/M	0.2 %

Prior year's comparatives aligned to presentation in the current year

¹ Goodwill and other intangible assets related to the share of DWS that is not held by Deutsche Bank are excluded since the first quarter of 2018

Adjusted post-tax return (Group)

Adjusted post-tax return (Group) adjusts Profit (loss) attributable to Deutsche Bank shareholders for specific revenue items and transformation charges (each of which is further described below), impairment of goodwill and other intangibles, and restructuring and severance, as well as for the impact of tax net of these items. Adjusted post-tax return on average tangible shareholders' equity is calculated by dividing Adjusted profit (loss) attributable to Deutsche Bank shareholders by Average allocated tangible shareholders' equity. The Group believes that a presentation of Adjusted post-tax return makes comparisons to its competitors easier.

in € m. (unless stated otherwise)	2022	2021	2020
Profit (loss) attributable to Deutsche Bank shareholders	4,919	2,025	101
Specific revenue items	(473)	(73)	(30)
Transformation charges	132	1,003	490
Impairment of goodwill / other intangibles	68	5	0
Restructuring & severance	(6)	470	688
Tax adjustments	81	(392)	(313)
of which: Tax effect of above adjustment items ¹	78	(393)	(321)
of which: Adjustments for share based payment related effects	3	1	(29)
of which: Adjustments for DTA valuation adjustments (transformation related)	0	0	37
Adjusted profit (loss) attributable to Deutsche Bank shareholders	4,722	3,037	936
Average allocated tangible shareholders' equity	53,780	50,489	49,182
Adjusted post-tax return on average tangible shareholders' equity	8.8 %	6.0 %	1.9 %

¹ Pre-tax adjustments taxed at a rate of 28%

Core Bank

The Core Bank represents the Group excluding the Capital Release Unit (CRU)

The following table presents the results of the Core Bank.

in € m. (unless stated otherwise)	2022	2021	2020
Profit (loss) before tax	6,379	4,882	3,203
Profit (loss)	6,225	3,577	2,196
Profit (loss) attributable to noncontrolling interests	134	144	129
Profit (loss) attributable to Deutsche Bank shareholders and additional equity components	6,091	3,433	2,067
Profit (loss) attributable to additional equity components	472	388	334
Profit (loss) attributable to Deutsche Bank shareholders	5,619	3,044	1,733
Average allocated shareholders' equity	57,091	52,064	49,142
Deduct: Average allocated goodwill and other intangible assets	6,266	5,953	5,985
Average allocated tangible shareholders' equity	50,824	46,111	43,157
Post-tax return on average shareholders' equity	9.8 %	5.8 %	3.5 %
Post-tax return on average tangible shareholders' equity	11.1 %	6.6 %	4.0 %

Prior year's comparatives aligned to presentation in the current year

The following table presents a reconciliation of Adjusted profit (loss) before tax of the Core Bank.

in € m. (unless stated otherwise)	2022	2021	2020
Profit (loss) before tax - Group	5,447	3,518	1,003
Profit (loss) before tax - CRU	(932)	(1,364)	(2,200)
Profit (loss) before tax - Core Bank	6,379	4,882	3,203

Prior year's comparatives aligned to presentation in the current year.

in € m. (unless stated otherwise)	2022	2021	2020
Profit (loss) before tax	6,379	4,882	3,203
Specific revenue items	(479)	(74)	(38)
Transformation charges	132	945	328
Impairment of goodwill / other intangibles	68	5	0
Restructuring & severance	(8)	464	671
Adjusted profit (loss) before tax - Core Bank	6,094	6,221	4,164

Adjusted post-tax return (Core Bank)

The following table presents a reconciliation of adjusted post-tax return on average tangible shareholders' equity of the Core Bank.

in € m. (unless stated otherwise)	2022	2021	2020
Profit (loss) attributable to Deutsche Bank shareholders	5,619	3,044	1,733
Specific revenue items	(479)	(74)	(38)
Transformation charges	132	945	328
Impairment of goodwill / other intangibles	68	5	0
Restructuring & severance	(8)	464	671
Tax adjustments	83	(374)	(261)
of which: Tax effect of above adjustment items ¹	80	(375)	(269)
of which: Adjustments for share based payment related effects	3	1	(29)
of which: Adjustments for DTA valuation adjustments (transformation-related)	0	0	37
Adjusted profit (loss) attributable to Deutsche Bank shareholders	5,416	4,010	2,433
Average allocated tangible shareholders' equity	50,824	46,111	43,157
Adjusted post-tax return on average tangible shareholders' equity	10.7 %	8.7 %	5.6 %

Prior year's comparatives aligned to presentation in the current year

¹Pre-tax adjustments taxed at a rate of 28%

Transformation charges

Transformation charges are costs, included in adjusted costs, that are directly related to Deutsche Bank's transformation as a result of the strategy announced on July 7, 2019 and certain costs related to incremental or accelerated decisions driven by the changes in the expected operations due to the COVID-19 pandemic. Such charges include the transformation-related impairment of software and real estate, the accelerated software amortization and other transformation charges like onerous contract provisions or legal and consulting fees related to the strategy execution. The table represents the transformation charges by the respective cost category.

in € m.	2022	2021	2020
Compensation and benefits	0	8	8
Information Technology	117	689	257
Professional services	12	35	18
Occupancy	0	258	196
Communication, data services, marketing	1	4	7
Other	3	8	4
Transformation charges	132	1,003	490

Adjusted costs

Adjusted costs is one of the Group's key performance indicators and is a non-GAAP financial measure for which the most directly comparable IFRS financial measure is noninterest expenses. Adjusted costs is calculated by deducting (i) impairment of goodwill and other intangible assets, (ii) net litigation charges and (iii) restructuring and severance (in total referred to as nonoperating costs) from noninterest expenses under IFRS. The Group believes that a presentation of noninterest expenses excluding the impact of these items provides a more meaningful depiction of the costs associated with the operating businesses. To show the development of the cost initiatives excluding costs that are directly related to Deutsche Bank's transformation as a result of the strategy announced on July 7, 2019, the Group also presents Adjusted costs excluding transformation charges, in which the transformation charges described above are deducted from Adjusted costs.

BNP Paribas and Deutsche Bank signed a master transaction agreement to provide continuity of service to Deutsche Bank's Prime Finance and Electronic Equities clients. Under the agreement Deutsche Bank operated the platform until clients were migrated to BNP Paribas by the end of 2021. Expenses of the transferred business were eligible for reimbursement by BNP Paribas. To show the development of the cost initiatives excluding not only transformation charges but also these eligible reimbursable expenses, for 2021 and 2020 the Group also presents Adjusted costs excluding transformation charges and expenses eligible for reimbursement related to Prime Finance.

	2022						
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total consolidated
Noninterest expenses	3,949	6,196	6,593	1,836	922	893	20,390
Impairment of goodwill and other intangible assets	0	0	0	68	0	0	68
Litigation charges, net	23	166	(60)	24	139	122	413
Restructuring and severance	(6)	44	(87)	37	2	5	(6)
Adjusted costs	3,933	5,986	6,740	1,708	781	767	19,915
Transformation charges	16	0	116	0	0	0	132
Adjusted costs ex. transformation charges	3,917	5,986	6,624	1,708	781	767	19,782

	2021						
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total consolidated
Noninterest expenses	4,143	5,831	7,433	1,664	1,432	1,002	21,505
Impairment of goodwill and other intangible assets	5	0	0	0	0	0	5
Litigation charges, net	2	99	134	2	230	1	466
Restructuring and severance	111	87	237	21	6	7	470
Adjusted costs	4,025	5,645	7,062	1,641	1,195	995	20,564
Transformation charges	58	60	221	3	57	603	1003
Adjusted costs ex. transformation charges	3,967	5,585	6,841	1,638	1,138	391	19,561
Expenses eligible for reimbursement related to Prime Finance							302
Adjusted costs ex. transformation charges and expenses eligible for reimbursement related to Prime Finance							19,259

Prior year's comparatives aligned to presentation in the current year

	2020						
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other	Total consolidated
Noninterest expenses	4,235	5,418	7,522	1,526	1,947	568	21,216
Impairment of goodwill and other intangible assets	0	0	0	0	0	0	0
Litigation charges, net	99	20	83	(1)	25	(67)	158
Restructuring and severance	79	26	520	37	17	10	688
Adjusted costs	4,058	5,373	6,920	1,490	1,905	625	20,370
Transformation charges	59	84	122	5	162	58	490
Adjusted costs ex. transformation charges	3,999	5,289	6,797	1,485	1,743	567	19,880
Expenses eligible for reimbursement related to Prime Finance							360
Adjusted costs ex. transformation charges and expenses eligible for reimbursement related to Prime Finance							19,520

Prior year's comparatives aligned to presentation in the current year

The following table presents a reconciliation of Adjusted costs excluding transformation charges and bank levies for the Group.

in € m. (unless stated otherwise)	2022	2021	2020
Adjusted costs ex. transformation charges	19,782	19,561	19,880
Bank levies	762	553	633
Adjusted costs ex. transformation charges and bank levies	19,020	19,008	19,247

Revenues excluding specific items

Revenues excluding specific items is a performance indicator that is a non-GAAP financial measure most directly comparable to the IFRS financial measure net revenues. Revenues excluding specific items is calculated by adjusting net revenues under IFRS for specific revenue items which generally fall outside the usual nature or scope of the business and are likely to distort an accurate assessment of the divisional operating performance. Excluded items are Debt Valuation Adjustment (DVA) and material transactions or events that are either one-off in nature or belong to a portfolio of connected transactions or events where the P&L impact is limited to a specific period of time. The Group believes that a presentation of net revenues excluding the impact of these items provides a more meaningful depiction of the revenues associated with the business.

	2022					
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other
Revenues	6,335	10,016	9,155	2,608	(28)	(1,024)
DVA	0	49	0	0	(6)	0
Sal. Oppenheim workout - International Private Bank	0	0	125	0	0	0
Gain on sale Financial Advisors business Italy – International Private Bank ¹	0	0	305	0	0	0
Total Specific revenue items	0	49	430	0	(6)	0
Revenues excluding specific items	6,335	9,968	8,725	2,608	(22)	(1,024)

¹ Gain on sale of € 312m, net of transaction-related fees of € 6m

	2021					
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other
Revenues	5,151	9,631	8,234	2,708	26	(212)
DVA	0	(28)	0	0	(2)	0
Sal. Oppenheim workout - International Private Bank	0	0	103	0	0	0
Gain on sale Financial Advisors business Italy – International Private Bank	0	0	0	0	0	0
Total Specific revenue items	0	(28)	103	0	(2)	0
Revenues excluding specific items	5,151	9,660	8,132	2,708	28	(212)

Prior year's comparatives aligned to presentation in the current year

	2020					
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Corporate & Other
Revenues	5,146	9,286	8,126	2,229	(225)	(552)
DVA	0	6	0	0	(8)	0
Sale of PB Systems to TCS	(16)	0	(88)	0	0	0
Change in valuation of an investment - FIC S&T	0	22	0	0	0	0
Sal. Oppenheim workout - International Private Bank	0	0	114	0	0	0
Gain on sale Financial Advisors business Italy – International Private Bank	0	0	0	0	0	0
Total Specific revenue items	(16)	28	26	0	(8)	0
Revenues excluding specific items	5,161	9,258	8,100	2,229	(217)	(552)

Prior year's comparatives aligned to presentation in the current year

Revenues and costs on a currency adjusted basis

Revenues and costs on a currency-adjusted basis are calculated by translating prior-period revenues or costs that were generated or incurred in non-euro currencies into euros at the foreign exchange rates that prevailed during the current year period. These adjusted figures, and period-to-period percentage changes based thereon, are intended to provide information on the development of underlying business volumes and costs.

Adjusted profit (loss) before tax

Adjusted profit (loss) before tax is calculated by adjusting the profit (loss) before tax under IFRS for specific revenue items, transformation charges, impairments of goodwill and other intangibles, as well as restructuring and severance expenses. The Group believes that a presentation of profit (losses) before tax excluding the impact of the foregoing items provides a more meaningful depiction of the profitability of the operating business.

	2022					
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Total consolidated
Profit (loss) before tax	2,051	3,487	1,979	598	(932)	5,447
Specific revenue items	0	(49)	(430)	0	6	(473)
Transformation charges	16	0	116	0	0	132
Impairment of goodwill / other intangibles	0	0	0	68	0	68
Restructuring & severance	(6)	44	(87)	37	2	(6)
Adjusted profit (loss) before tax	2,061	3,482	1,578	703	(925)	5,168

	2021					
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Total consolidated
Profit (loss) before tax	1,011	3,714	355	816	(1,364)	3,518
Specific revenue items	0	28	(103)	0	2	(73)
Transformation charges	58	60	221	3	57	1,003
Impairment of goodwill / other intangibles	5	0	0	0	0	5
Restructuring & severance	111	87	237	21	6	470
Adjusted profit (loss) before tax	1,185	3,889	711	840	(1,298)	4,923

Prior year's comparatives aligned to presentation in the current year

	2020					
in € m.	Corporate Bank	Investment Bank	Private Bank	Asset Management	Capital Release Unit	Total consolidated
Profit (loss) before tax	547	3,166	(108)	544	(2,200)	1,003
Specific revenue items	16	(28)	(26)	0	8	(30)
Transformation charges	59	84	122	5	162	490
Impairment of goodwill / other intangibles	0	0	0	0	0	0
Restructuring & severance	79	26	520	37	17	688
Adjusted profit (loss) before tax	700	3,248	509	586	(2,013)	2,151

Prior year's comparatives aligned to presentation in the current year

Adjustments regarding BGH ruling on pricing agreements for Private Bank

In the second quarter of 2021, the bank introduced a pro-forma disclosure, which is a non-GAAP financial measure, that excludes impacts related to a BGH ruling on pricing agreements from Private Bank's revenues, profit before tax and post-tax return on average tangible shareholder's equity. The bank introduced this disclosure to improve comparability of Private Bank's operational trends compared to the prior quarters.

in € m.

(unless stated otherwise)

	2022	2021	2020
Net Revenues	9,155	8,234	8,126
BGH ruling on pricing agreements - impact of forgone revenues	22	154	–
of which: Private Bank Germany - BGH ruling on pricing agreements - impact of forgone revenues	23	152	–
Net revenues ex BGH ruling on pricing agreements	9,177	8,388	8,126
of which: Private Bank Germany net revenues ex BGH ruling on pricing agreements	5,351	5,160	4,989
Revenue specific items	(430)	(103)	(26)
Net revenues ex specific items ex BGH ruling on pricing agreements	8,747	8,285	8,100
therein: Private Bank Germany – revenues ex specific items ex BGH ruling on pricing agreements	5,351	5,160	5,077
Adjusted profit (loss) before tax	1,578	711	509
BGH ruling - total impact	(60)	284	–
of which: impact of forgone revenues	22	154	–
of which: impact of additional adjusted costs	4	2	–
of which: impact of litigation charges	(86)	128	–
Adjusted profit (loss) before tax ex BGH ruling on pricing agreements	1,518	994	509
Adjusted profit (loss) ex BGH ruling on pricing agreements	1,093	716	366
Profit (loss) attributable to noncontrolling interests	–	–	–
Profit (loss) attributable to additional equity components	116	97	79
Adjusted Profit (loss) attributable to Deutsche Bank shareholders ex BGH ruling on pricing agreements	977	619	287
Average allocated tangible shareholders' equity	12,409	11,408	10,298
Adjusted post-tax RoTE ex BGH ruling on pricing agreements (in %)	7.9 %	5.4 %	2.8 %
Reported post-tax RoTE (in %)	10.6 %	1.4 %	(1.5) %

Net assets (adjusted)

Net assets (adjusted) are defined as IFRS Total assets adjusted to reflect the recognition of legal netting agreements, offsetting of cash collateral received and paid and offsetting pending settlements balances. The Group believes that a presentation of net assets (adjusted) makes comparisons to its competitors easier.

in € b.

(unless stated otherwise)

	2022	2021	2020
Total assets	1,344	1,325	1,325
Deduct: Derivatives (incl. hedging derivatives) credit line netting	228	239	266
Deduct: Derivatives cash collateral received / paid	70	65	83
Deduct: Securities Financing Transactions credit line netting	2	2	1
Deduct: Pending settlements netting	17	15	12
Net assets	1,026	1,003	962

Book Value and Tangible Book Value per Basic Share Outstanding

Book value per basic share outstanding and tangible book value per basic share outstanding are non-GAAP financial measures that are used and relied upon by investors and industry analysts as capital adequacy metrics. Book value per basic share outstanding represents the Bank's total shareholders' equity divided by the number of basic shares outstanding at period-end. Tangible book value represents the Bank's total shareholders' equity less goodwill and other intangible assets. Tangible book value per basic share outstanding is computed by dividing tangible book value by period-end basic shares outstanding.

Tangible Book Value

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Total shareholders' equity (Book value)	61,772	58,096	54,774	3,676	6	3,322	6
Goodwill and other intangible assets ¹	(6,327)	(6,079)	(5,997)	(248)	4	(82)	1
Tangible shareholders' equity (Tangible book value)	55,445	52,017	48,777	3,428	7	3,240	7

¹ Excludes Goodwill and other intangible assets attributable to partial sale of DWS

Basic Shares Outstanding

in € m. (unless stated otherwise)	2022	2021	2020	2022 increase (decrease) from 2021		2021 increase (decrease) from 2020	
				in € m.	in %	in € m.	in %
Number of shares	2,066.8	2,066.8	2,066.8	0	0	0	0
Shares outstanding:							
Treasury shares	(28.9)	(0.7)	(1.3)	(28.3)	N/M	0.7	(49.6)
Vested share awards	45.6	34.5	38.6	11.0	32.0	(4.1)	(10.7)
Basic shares outstanding	2,083.4	2,100.6	2,104.1	(17.2)	(0.8)	(3.4)	(0.2)
Book value per basic share outstanding in €	29.65	27.66	26.03	1.99	7.2	1.63	6.3
Tangible book value per basic share outstanding in €	26.61	24.76	23.18	1.85	7.5	1.58	6.8

CRR/CRD Regulatory measures

The Group's regulatory assets, exposures, risk-weighted assets, capital and ratios are calculated for regulatory purposes and are set forth throughout this document under the CRR/CRD as currently applicable.

For the comparatives as of December 31, 2021 certain figures are based on the CRR definition of own fund instruments (applicable for Additional Tier 1 (AT1) capital and Tier 2 capital and figures based thereon, including Tier 1, Total Capital and Leverage Ratio) are presented on a "fully loaded" basis. Such fully loaded figures are calculated excluding the transitional arrangements for own fund instruments as provided in the currently applicable CRR/CRD. Deutsche Bank had immaterial amounts of such instruments outstanding at year end 2022. For those comparatives periods the CET 1 and RWA figures include the transitional impacts from the IFRS 9 add-back also in the fully-loaded figures given it is an immaterial difference. Measures calculated pursuant to the Group's fully loaded methodology are non-GAAP financial measures.

Deutsche Bank believes that these fully loaded calculations provided useful information to investors as they reflected the bank's progress against then known future regulatory capital standards. Many of Deutsche Bank's competitors have been describing calculations on a fully loaded basis, however, competitors' assumptions and estimates regarding fully loaded calculations may have varied such that the bank's fully loaded measures may not have been comparable with similarly labelled measures used by its competitors.

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Supplemental Financial Information (Unaudited)

Information Required by Subpart 1400 of SEC Regulation S-K

Amounts for 2022, 2021 and 2020 are prepared in accordance with IFRS, which is consistent with the Group's Financial Statements.

Financial condition

Average balance sheet based upon month-end balances

Average balance sheet and interest and similar income

in € m. (unless stated otherwise)	2022			2021			2020		
	Average balance	Interest	Average yield/rate	Average balance	Interest	Average yield/rate	Average balance	Interest	Average yield/rate
Assets:¹									
Interest-earning deposits with banks: ^{2,4}									
In German offices	85,923	251	0.29 %	97,389	(352)	(0.36) %	68,237	(14)	(0.02) %
In Non-German offices	86,204	1,852	2.15 %	82,684	203	0.25 %	74,415	422	0.57 %
Total interest-earning deposits with banks	172,127	2,104	1.22 %	180,073	(149)	(0.08) %	142,653	408	0.29 %
Central bank funds sold: ⁵									
In German offices	0	0	0.00 %	0	0	0.00 %	0	0	0.00 %
In Non-German offices	0	1	0.00 %	0	0	0.00 %	0	1	0.00 %
Total central bank funds sold	0	1	0.00 %	0	0	0.00 %	0	1	0.00 %
Securities purchased under resale agreements: ^{4,5}									
In German offices	3,116	112	3.59 %	2,426	42	1.74 %	2,974	23	0.78 %
In Non-German offices	6,239	392	6.28 %	6,262	231	3.68 %	6,357	284	4.47 %
Total securities purchased under resale agreements	9,355	504	5.38 %	8,687	273	3.14 %	9,331	307	3.30 %
Securities borrowed: ⁴									
In German offices	119	2	1.99 %	101	4	4.18 %	79	12	14.96 %
In Non-German offices	0	48	N/M	0	19	N/M	33	4	13.61 %
Total securities borrowed	119	51	42.33 %	101	23	23.03 %	111	16	14.57 %
Interest-earning financial assets at fair value through profit or loss: ⁴									
In German offices	58,722	477	0.81 %	48,855	321	0.66 %	39,225	373	0.95 %
In Non-German offices	146,147	3,852	2.64 %	157,248	2,656	1.69 %	166,474	3,341	2.01 %
Total interest-earning financial assets at fair value through profit or loss	204,869	4,328	2.11 %	206,103	2,977	1.44 %	205,698	3,714	1.81 %
Financial assets at fair value through OCI: ⁴									
In German offices	3,043	38	1.25 %	3,080	6	0.18 %	4,292	8	0.19 %
In Non-German offices	29,781	761	2.56 %	35,526	497	1.40 %	44,391	628	1.42 %
Total financial assets at fair value through OCI	32,825	799	2.43 %	38,606	502	1.30 %	48,683	637	1.31 %
Loans at amortized cost: ^{3,4}									
In German offices	260,928	5,446	2.09 %	245,221	5,176	2.11 %	232,312	5,241	2.26 %
In Non-German offices	232,658	8,793	3.78 %	201,300	5,474	2.72 %	205,374	6,345	3.09 %
Total loans	493,587	14,239	2.88 %	446,521	10,650	2.39 %	437,686	11,586	2.65 %
Total other interest-earning assets⁴	74,242	1,005	1.35 %	58,178	493	0.85 %	76,096	218	0.29 %
Total interest-earning assets	987,124	23,030	2.33 %	938,269	14,769	1.57 %	920,259	16,887	1.83 %
Cash and due from banks	18,515			17,939			21,477		
Noninterest-earning financial assets at fair value through profit or loss:									
In German offices	153,294			159,417			212,204		
In Non-German offices	170,096			137,555			164,528		
All other assets	88,383			96,307			90,771		
Allowance for credit losses	(5,029)			(4,905)			(4,681)		
Total assets	1,412,384			1,344,581			1,404,557		
% of assets attributable to Non-German offices	49 %			56 %			57 %		

Average balance sheet and interest expense in € m. (unless stated otherwise)	2022			2021			2020		
	Average balance	Interest	Average yield/rate	Average balance	Interest	Average yield/rate	Average balance	Interest	Average yield/rate
Liabilities and equity:¹									
Interest-bearing deposits: ⁴									
In German offices:									
Time deposits	80,142	995	1.24 %	67,256	355	0.53 %	79,905	469	0.59 %
Savings deposits	85,360	254	0.30 %	85,372	329	0.39 %	84,507	358	0.42 %
Demand deposits	70,200	(83)	(0.12) %	77,993	(394)	(0.51) %	67,098	(134)	(0.20) %
Total in German offices	235,702	1,165	0.49 %	230,621	289	0.13 %	231,510	693	0.30 %
In Non-German offices:									
Time deposits	55,530	1,488	2.68 %	39,570	468	1.18 %	40,661	766	1.88 %
Savings deposits	1,823	49	2.70 %	1,621	21	1.30 %	1,226	22	1.76 %
Demand deposits	91,542	619	0.68 %	86,777	231	0.27 %	78,487	348	0.44 %
Total in Non-German offices	148,895	2,157	1.45 %	127,969	720	0.56 %	120,374	1,135	0.94 %
Total interest-bearing deposits	384,598	3,322	0.86 %	358,590	1,009	0.28 %	351,884	1,828	0.52 %
Central bank funds purchased: ⁵									
In German offices	0	0	0.00 %	0	0	0.00 %	1,903	8	0.40 %
In Non-German offices	0	12	0.00 %	8	0	0.00 %	442	0	0.06 %
Total central bank funds purchased	0	12	0.00 %	8	0	0.00 %	2,345	8	0.34 %
Securities sold under repurchase agreements: ^{4,5}									
In German offices	274	97	35.24 %	113	43	38.03 %	835	32	3.78 %
In Non-German offices	808	195	24.14 %	2,237	105	4.70 %	2,532	129	5.10 %
Total securities sold under repurchase agreements	1,082	292	26.95 %	2,350	148	6.30 %	3,366	161	4.78 %
Securities loaned: ⁴									
In German offices	1	0	(4.76) %	0	7	N/M	52	5	9.24 %
In Non-German offices	16	14	87.36 %	1,027	33	3.19 %	822	(1)	(0.13) %
Total securities loaned	17	14	82.39 %	1,027	39	3.85 %	874	4	0.43 %
Interest-bearing financial liabilities at fair value through profit or loss: ⁴									
In German offices	39,620	529	1.34 %	32,045	319	1.00 %	20,758	226	1.09 %
In Non-German offices	87,295	1,939	2.22 %	85,881	904	1.05 %	83,963	1,265	1.51 %
Total interest-bearing financial liabilities at fair value through profit or loss	126,914	2,468	1.94 %	117,926	1,223	1.04 %	104,721	1,490	1.42 %
Commercial paper: ⁵									
In German offices	1,286	8	0.64 %	602	0	(0.01) %	69	0	0.09 %
In Non-German offices	531	6	1.15 %	1,168	9	0.81 %	1,540	18	1.17 %
Total commercial paper	1,817	14	0.79 %	1,770	9	0.53 %	1,609	18	1.12 %
Other short-term borrowings: ⁴									
In German offices	713	13	1.83 %	675	21	3.08 %	505	8	1.59 %
In Non-German offices	2,398	83	3.48 %	1,414	38	2.68 %	2,334	33	1.41 %
Total other short-term borrowings	3,111	97	3.10 %	2,089	59	2.81 %	2,839	41	1.44 %
Long-term debt and trust preferred securities: ⁴									
In German offices	104,507	1,213	1.16 %	107,416	417	0.39 %	97,060	877	0.90 %
In Non-German offices	39,427	876	2.22 %	41,130	561	1.37 %	48,435	639	1.32 %
Total long-term debt and trust preferred securities	143,934	2,090	1.45 %	148,546	978	0.66 %	145,496	1,517	1.04 %
Total other interest-bearing liabilities⁴	65,793	739	1.12 %	58,436	186	0.32 %	72,638	272	0.37 %
Total interest-bearing liabilities	727,265	9,047	1.24 %	690,742	3,652	0.53 %	685,772	5,338	0.78 %

Average balance sheet and interest expense in € m. (unless stated otherwise)	2022			2021			2020		
	Average balance	Interest	Average yield/rate	Average balance	Interest	Average yield/rate	Average balance	Interest	Average yield/rate
Noninterest-bearing deposits:									
In German offices	205,775			193,115			193,022		
In Non-German offices	32,361			29,900			24,570		
Noninterest-bearing financial liabilities at fair value through profit or loss:									
In German offices	135,751			151,743			197,946		
In Non-German offices	171,287			130,709			161,446		
All other noninterest-bearing liabilities	70,097			83,425			79,220		
Total shareholders' equity	60,109			56,537			55,302		
Additional equity components	7,944			6,779			5,644		
Noncontrolling interests	1,795			1,630			1,634		
Total equity	69,848			64,947			62,580		
Total liabilities and equity	1,412,384			1,344,581			1,404,557		
% of liabilities attributable to Non-German offices	42 %			40 %			41 %		
Rate spread	1.09 %			1.05 %			1.06 %		
Net interest margin (Net interest income to total interest-earning assets):									
In German offices	0.85 %			1.03 %			1.06 %		
In Non-German offices	1.87 %			1.30 %			1.37 %		
Total	1.42 %			1.18 %			1.25 %		

N/M – Not meaningful

¹ The allocation of the assets and liabilities between German and Non-German offices are based on the location of the entity which carries the respective asset or liability.

² Interest-earning deposits with banks include interest earning deposit with central bank and interest earning deposit with bank w/o central bank.

³ Loans include impaired loans.

⁴ Figures in interest revenue and expense positions are based on net effect of negative interest revenue and expenses. However, negative interest revenue and expenses are reported in "others" in interest and similar income and interest expenses, respectively, in Note 5 to the consolidated financial statement.

⁵ As per the Securities Exchange Commission's revised guidance, Central bank funds sold, Securities purchased under resale agreements, Central bank funds purchase, Securities sold under repurchase agreements and Commercial paper have been disclosed separately along with prior year's figure.

Analysis of changes in interest and similar income and interest expense

in € m.	2022 over 2021 due to changes in ¹			2021 over 2020 due to changes in ¹		
	Net change	Volume	Rate	Net change	Volume	Rate
Interest and similar income:						
Interest-earning deposits with banks:						
German offices	603	37	567	(338)	(9)	(329)
Non-German offices	1,650	9	1,641	(219)	43	(262)
Total interest-earning deposits with banks	2,253	46	2,207	(557)	34	(591)
Central bank funds sold:						
German offices	0	0	0	0	0	0
Non-German offices	0	0	0	(1)	0	(1)
Total central bank funds sold	0	0	0	(1)	0	(1)
Securities purchased under resale agreements:						
German offices	70	15	55	19	(5)	24
Non-German offices	161	(1)	162	(54)	(4)	(50)
Total securities purchased under resale agreements	231	14	217	(35)	(9)	(26)
Securities borrowed:						
German offices	(2)	1	(3)	(8)	3	(10)
Non-German offices	29	29	0	15	(9)	23
Total securities borrowed	27	29	(2)	7	(6)	13
Financial assets at fair value through profit or loss:						
German offices	156	72	84	(52)	79	(131)
Non-German offices	1,196	(199)	1,395	(685)	(178)	(507)
Total financial assets at fair value through profit or loss	1,351	(127)	1,479	(737)	(98)	(639)
Financial assets at fair value through OCI:						
German offices	32	N/A	33	(3)	(2)	N/A
Non-German offices	264	(91)	356	(132)	(124)	(8)
Total financial assets at fair value through OCI	297	(91)	388	(134)	(126)	(8)
Loans at amortized cost:						
German offices	270	328	(58)	(66)	283	(348)
Non-German offices	3,318	948	2,371	(870)	(124)	(747)
Total loans	3,589	1,276	2,313	(936)	159	(1,095)
Other interest-earning assets	512	288	224	275	(24)	300
Total interest and similar income	8,260	1,435	6,825	(2,117)	(72)	(2,045)
Interest expense:						
Interest-bearing deposits:						
German offices	876	7	869	(404)	(3)	(401)
Non-German offices	1,437	135	1,302	(415)	68	(483)
Total interest-bearing deposits	2,313	142	2,171	(819)	65	(884)
Central bank funds purchased:						

	2022 over 2021 due to changes in ¹			2021 over 2020 due to changes in ¹		
German offices	0	0	0	(8)	(4)	(4)
Non-German offices	0	0	0	0	0	0
Total central bank funds purchased agreements	0	0	0	(8)	(4)	(4)
Securities sold under repurchase agreements:						
German offices	54	57	(3)	11	(49)	60
Non-German offices	90	(104)	194	(24)	(14)	(10)
Total securities sold under repurchase agreements	143	(47)	191	(13)	(63)	51
Securities loaned:						
German offices	(7)	(7)	0	2	0	2
Non-German offices	(19)	(63)	44	34	0	34
Total securities loaned	(26)	(70)	44	36	0	36
Financial liabilities at fair value through profit or loss:						
German offices	210	86	124	93	114	(20)
Non-German offices	1,035	15	1,020	(361)	28	(389)
Total financial liabilities at fair value through profit or loss	1,245	101	1,144	(267)	142	(410)
Commercial paper:						
German offices	8	0	8	0	0	0
Non-German offices	(3)	(6)	3	(9)	(4)	(5)
Total commercial paper	5	(6)	11	(9)	(4)	(5)
Other short-term borrowings:						
German offices	(8)	1	(9)	13	3	9
Non-German offices	45	32	14	5	(16)	22
Total other short-term borrowings	38	33	5	18	(13)	31
Long-term debt and trust preferred securities:						
German offices	797	(12)	808	(461)	85	(546)
Non-German offices	315	(24)	339	(78)	(99)	21
Total long-term debt and trust preferred securities	1,111	(36)	1,147	(539)	(14)	(525)
Other interest-bearing liabilities	552	28	524	(86)	12	(98)
Total interest expense	5,382	144	5,238	(1,686)	121	(1,807)
Net change in net interest income	2,878	1,290	1,587	(431)	(193)	(238)

¹ Changes due to combination of volume and rate are allocated proportionally.

Investment portfolio

The Group's total investment portfolio as of December 31, 2022, was € 51.0 billion (debt securities at fair value through other comprehensive income € 25.5 billion and debt securities at amortized cost € 25.6 billion).

The following table presents the approximate weighted-average yields (based on amortized cost) by maturity distribution of the Group's investment portfolio as of December 31, 2022:

in € m.	Up to one year		More than one year and up to five years		More than five years and up to ten years		More than ten years		Total	
	Amount	Yield	Amount	Yield	Amount	Yield	Amount	Yield	Amount	Yield
German government	630	1.5 %	274	3.4 %	241	(0.1) %	87	0.9 %	1,232	1.5 %
U.S. Treasury and U.S. government agencies	4,020	1.7 %	9,950	2.2 %	9,713	1.3 %	739	2.2 %	24,422	1.7 %
U.S. local (municipal) governments	9	5.1 %	50	5.1 %	54	5.0 %	462	8.3 %	575	7.4 %
Other foreign governments	2,914	3.2 %	4,818	3.2 %	7,428	1.2 %	1,188	1.6 %	16,347	2.1 %
Corporates	121	4.0 %	438	5.0 %	390	4.5 %	863	4.5 %	1,812	4.6 %
Other asset-backed securities	0	0.0 %	152	1.3 %	0	0.0 %	145	0.8 %	298	1.1 %
Mortgage-backed securities, including obligations of U.S. federal agencies	1,769	5.0 %	520	4.0 %	18	3.7 %	468	3.7 %	2,775	4.6 %
Other debt securities	405	6.1 %	1,155	2.8 %	691	1.6 %	1,335	2.3 %	3,586	2.7 %

Loan Portfolio

Analysis of maturities of the Group's loan portfolio (excluding lease financing)

Dec 31, 2022 in € m.	Within 1 year	After 1 but within 5 years	After 5 but within 15 years	After 15 years	Total
German:					
Agriculture, forestry and fishing	61	28	96	53	239
Mining and quarrying	49	25	59	1	134
Manufacturing	6,705	3,444	1,527	239	11,915
Electricity, gas, steam and air conditioning supply	255	358	661	145	1,419
Water supply, sewerage, waste management and remediation activities	114	122	153	42	431
Construction	400	264	443	391	1,498
Wholesale and retail trade, repair of motor vehicles and motorcycles	4,626	1,670	952	458	7,705
Transport and storage	432	494	303	57	1,286
Accommodation and food service activities	33	326	293	155	808
Information and communication	459	545	146	182	1,331
Financial and insurance activities	3,657	4,296	2,609	1,015	11,578
Real estate activities	2,017	2,637	3,733	4,335	12,722
Professional, scientific and technical activities	742	810	1,753	1,327	4,633
Administrative and support service activities	459	109	697	379	1,645
Public administration and defense, compulsory social security	1,496	218	125	8	1,846
Education	11	18	49	37	116
Human health services and social work activities	291	555	1,332	735	2,913
Arts, entertainment and recreation	56	81	86	144	367
Other service activities	1,407	757	519	336	3,019
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	6,767	12,119	45,545	113,093	177,523
Activities of extraterritorial organizations and bodies	0	0	0	0	0
Total German	30,037	28,876	61,081	123,133	243,127
Non-German:					
Agriculture, forestry and fishing	113	120	47	6	287
Mining and quarrying	1,112	870	560	3	2,545
Manufacturing	13,565	5,197	1,618	51	20,431
Electricity, gas, steam and air conditioning supply	1,048	1,479	1,149	8	3,684
Water supply, sewerage, waste management and remediation activities	89	192	11	1	293
Construction	1,148	1,467	271	108	2,993
Wholesale and retail trade, repair of motor vehicles and motorcycles	11,003	2,460	855	576	14,894
Transport and storage	1,272	2,488	969	36	4,766
Accommodation and food service activities	252	628	249	36	1,164
Information and communication	3,117	2,843	387	105	6,452
Financial and insurance activities	41,870	58,031	8,600	1,253	109,754
Real estate activities	14,658	19,003	3,080	208	36,948
Professional, scientific and technical activities	1,100	815	352	236	2,503
Administrative and support service activities	2,092	3,412	735	34	6,272
Public administration and defense, compulsory social security	1,086	1,113	1,931	1	4,131
Education	43	48	28	15	133
Human health services and social work activities	122	1,179	123	216	1,640
Arts, entertainment and recreation	66	659	72	15	813
Other service activities	787	1,152	608	211	2,759
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	15,033	9,570	9,165	9,808	43,576
Activities of extraterritorial organizations and bodies	0	0	0	0	1
Total Non-German	109,575	112,725	30,811	12,928	266,038
Gross loans	139,612	141,601	91,892	136,061	509,165
(Deferred expense)/unearned income	(108)	(377)	208	407	131
Loans less (deferred expense)/unearned income	139,720	141,977	91,683	135,654	509,034

Volumes of loans in loan portfolio (excluding lease financing) with residual maturities of more than one year from that date

Dec 31, 2022 in € m.	Within 1 years	After one but within 5 years	After 5 but within 15 years	After 15 years	Total
Fixed rate loans	46,043	37,789	68,650	124,128	276,610
Floating or adjustable rate loans	93,569	103,811	23,241	11,933	232,555
Total	139,612	141,601	91,892	136,061	509,165

Allowances for Credit Losses

In accordance with updated SEC disclosure requirements as of September 2020, we below show Loans at amortized cost, Allowance for loan losses, net charge offs and two credit ratios by NACE code. Numbers for exposures and allowances differ from those disclosed in the Asset Quality section of this report, where we apply a broader scope (all Financial assets at amortized cost rather than just loans) in line with IFRS 9 requirements.

Loans at amortized Cost by Industry type

in € m.	Dec 31, 2022				
	Loans at amortized cost (Gross carrying Amount)	Allowance for credit losses	Net Charge Offs	Allowance for credit losses to total loans at amortized cost at end of period (%) ¹	Net charge-offs during the period to average loans at amortized cost outstanding during the period (%)
Agriculture, forestry and fishing	524	10	1	1.84%	0.18%
Mining and quarrying	2,392	32	24	1.32%	0.87%
Manufacturing	30,534	618	62	2.02%	0.19%
Electricity, gas, steam and air conditioning supply	4,893	42	0	0.85%	0.00%
Water supply, sewerage, waste management and remediation activities	725	8	0	1.06%	0.02%
Construction	4,239	114	103	2.70%	2.25%
Wholesale and retail trade, repair of motor vehicles and motorcycles	21,535	436	18	2.02%	0.08%
Transport and storage	5,547	52	8	0.93%	0.15%
Accommodation and food service activities	1,965	66	4	3.37%	0.16%
Information and communication	7,002	120	5	1.72%	0.08%
Financial and insurance activities	116,190	711	27	0.61%	0.02%
Real estate activities	48,380	236	66	0.49%	0.15%
Professional, scientific and technical activities	7,013	87	23	1.25%	0.33%
Administrative and support service activities	7,429	121	38	1.62%	0.45%
Public administration and defense, compulsory social security	5,287	13	0	0.24%	0.00%
Education	249	3	0	1.11%	0.15%
Human health services and social work activities	4,523	26	5	0.57%	0.12%
Arts, entertainment and recreation	1,128	9	0	0.82%	0.02%
Other service activities	4,152	83	24	1.99%	0.50%
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	214,795	2,005	562	0.93%	0.26%
Activities of extraterritorial organizations and bodies	1	0	0	0.70%	22.98%
Total	488,504	4,790	971	0.98%	0.20%

¹ Credit ratio defined as allowance for credit losses to total loans at amortized cost at the end of period in this table excludes collateral. Considering collateral, credit ratio is materially higher.

Loan at Amortized Cost exposure went up by € 12 billion or 3 % in 2022 compared to 2021, which was driven by Private Bank as well as Investment Bank.

Loan loss allowance slightly increased by € 36 million or 1 % in 2022.

Net charge-offs increased by € 484 million or 99 % in 2022 due to the non-performing portfolio sales in Private Bank.

in € m.	Dec 31, 2021				
	Loans at amortized cost (Gross carrying Amount)	Allowance for credit losses	Net Charge Offs	Allowance for credit losses to total loans at amortized cost at end of period (%) ¹	Net charge-offs during the period to average loans at amortized cost outstanding during the period (%)
Agriculture, forestry and fishing	645	12	1	1.91%	0.22%
Mining and quarrying	2,783	17	16	0.60%	0.64%
Manufacturing	35,404	543	46	1.53%	0.17%
Electricity, gas, steam and air conditioning supply	4,548	45	(0)	0.99%	(0.00%)
Water supply, sewerage, waste management and remediation activities	681	11	1	1.54%	0.08%
Construction	4,374	200	14	4.56%	0.32%
Wholesale and retail trade, repair of motor vehicles and motorcycles	21,285	432	160	2.03%	0.78%
Transport and storage	5,330	75	24	1.40%	0.45%
Accommodation and food service activities	2,259	73	1	3.22%	0.04%
Information and communication	6,363	111	0	1.75%	0.01%
Financial and insurance activities	106,343	430	19	0.40%	0.02%
Real estate activities	40,629	188	7	0.46%	0.02%
Professional, scientific and technical activities	6,959	104	14	1.49%	0.19%
Administrative and support service activities	9,759	167	7	1.71%	0.07%
Public administration and defense, compulsory social security	6,183	18	(0)	0.30%	(0.00%)
Education	225	3	0	1.18%	0.08%
Human health services and social work activities	3,869	28	1	0.73%	0.03%
Arts, entertainment and recreation	1,062	8	(1)	0.74%	(0.06%)
Other service activities	4,941	100	(10)	2.02%	(0.19%)
Activities of households as employers, undifferentiated goods- and services- producing activities of households for own use	212,434	2,190	189	1.03%	0.09%
Activities of extraterritorial organizations and bodies	1	1	0	64.65%	0.00%
Total	476,077	4,754	488	1.00%	0.11%

¹ Credit ratio defined as allowance for credit losses to total loans at amortized cost at the end of period in this table excludes collateral. Considering collateral, credit ratio is materially higher.

Loan at Amortized Cost exposure went up by € 44 billion or 10 % in 2021 compared to 2020, which was mainly due to the increase in Investment Bank and Private Bank.

Loan loss allowance slightly declined by € 54 million or 1 % in 2021.

Net charge-offs reduced by € 236 million or 33 % in 2021, due to non-recurrence of write-offs in Financial and insurance activities from 2020.

in € m.	Dec 31, 2020				
	Loans at amortized cost (Gross carrying Amount)	Allowance for credit losses	Net Charge Offs	Allowance for credit losses to total loans at amortized cost at end of period (%) ¹	Net charge-offs during the period to average loans at amortized cost outstanding during the period (%)
Agriculture, forestry and fishing	637	14	0	2.20%	0.04%
Mining and quarrying	2,871	106	20	3.70%	0.68%
Manufacturing	26,050	556	107	2.14%	0.41%
Electricity, gas, steam and air conditioning supply	3,419	40	(0)	1.16%	(0.01)%
Water supply, sewerage, waste management and remediation activities	681	12	0	1.70%	0.02%
Construction	4,440	212	23	4.77%	0.51%
Wholesale and retail trade, repair of motor vehicles and motorcycles	20,697	557	37	2.69%	0.18%
Transport and storage	5,575	108	8	1.94%	0.15%
Accommodation and food service activities	2,427	35	11	1.44%	0.44%
Information and communication	5,525	110	2	2.00%	0.03%
Financial and insurance activities	84,770	389	164	0.46%	0.19%
Real estate activities	41,796	188	50	0.45%	0.12%
Professional, scientific and technical activities	7,707	121	7	1.57%	0.09%
Administrative and support service activities	9,112	125	16	1.37%	0.18%
Public administration and defense, compulsory social security	6,139	22	(0)	0.36%	(0.00)%
Education	205	2	0	0.89%	0.24%
Human health services and social work activities	3,436	17	1	0.50%	0.03%
Arts, entertainment and recreation	929	7	10	0.79%	1.12%
Other service activities	4,696	75	1	1.59%	0.01%
Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	200,694	2,110	266	1.05%	0.13%
Activities of extraterritorial organizations and bodies	1	1	0	54.52%	0.00%
Total	431,807	4,808	723	1.11%	0.17%

¹ Credit ratio defined as allowance for credit losses to total loans at amortized cost at the end of period in this table excludes collateral. Considering collateral, credit ratio is materially higher.

Foreign outstandings

The following tables list only those countries for which the cross-border outstandings exceeded 0.75 % of the Group's total assets as of December 31, 2022, 2021 and 2020. Offsetting of local country claims is done for third party liabilities of the respective foreign offices that represent legal obligations of the foreign offices and for which no payment is guaranteed at locations outside of the country of the office. As of December 31, 2022, there were no outstandings that exceeded 0.75 % of total assets in any country currently facing debt restructuring or liquidity problems that the Group expects would materially impact the country's ability to service its obligations.

in € m. (unless stated otherwise)	Dec 31, 2022						
	Banks and other financial institutions	Governments and Official institutions	Other ¹	Commit- ments	Net local country claim	Total	in %
USA	5,083	48,556	88,193	6,739	139,166	287,737	21.52
Italy	4,289	25,442	12,564	1,690	24,764	68,749	5.14
Great Britain	3,326	23,051	19,479	9,275	12,546	67,677	5.06
Luxembourg	8,364	4,031	28,642	3,977	5,982	50,997	3.81
France	2,480	12,338	17,181	7,559	2,673	42,231	3.16
Spain	2,209	10,205	8,496	1,954	–	22,864	1.71
Ireland	343	3,415	14,257	2,452	–	20,467	1.53
Switzerland	1,020	3,828	7,325	5,698	1,146	19,017	1.42
Netherlands	1,109	2,829	6,091	5,436	–	15,465	1.16
Belgium	1,034	5,362	2,888	1,101	–	10,385	0.78

¹ Other includes commercial and industrial, insurance and other loans.

Dec 31, 2021

in € m. (unless stated otherwise)	Banks and other financial institutions	Governments and Official institutions	Other ¹	Commit- ments	Net local country claim	Total	in %
USA	5,246	32,696	85,922	7,863	133,783	265,510	20.05
Great Britain	3,056	21,943	16,152	6,478	22,610	70,239	5.31
Luxembourg	8,167	4,142	28,865	3,889	7,911	52,974	4.00
Italy	2,535	11,904	10,266	1,547	23,435	49,687	3.75
France	2,865	15,147	19,620	7,212	2,542	47,386	3.58
Spain	1,934	16,311	10,688	1,786	–	30,719	2.32
Switzerland	1,477	3,784	13,403	4,733	1,185	24,582	1.86
Ireland	208	2,887	12,785	2,177	–	18,057	1.36
Netherlands	927	3,115	6,459	4,662	–	15,163	1.15
Belgium	1,202	5,219	2,865	1,647	–	10,933	0.83

¹ Other includes commercial and industrial, insurance and other loans.

Dec 31, 2020

in € m. (unless stated otherwise)	Banks and other financial institutions	Governments and Official institutions	Other ¹	Commit- ments	Net local country claim	Total	in %
United States	4,962	30,094	73,257	5,761	109,188	223,262	16.85
Great Britain	3,576	20,387	13,243	5,854	33,159	76,219	5.75
France	2,951	18,369	21,550	6,173	3,420	52,463	3.96
Italy	1,796	14,286	9,687	1,072	22,742	49,583	3.74
Luxembourg	7,979	4,732	28,323	2,867	5,535	49,436	3.73
Spain	1,796	10,308	13,090	2,920	–	28,114	2.12
Netherlands	1,137	2,814	9,246	5,567	–	18,765	1.42
Switzerland	1,596	3,885	6,294	4,898	1,070	17,743	1.34
Ireland	272	2,481	12,508	1,288	–	16,548	1.25
Belgium	1,090	5,171	3,705	1,599	–	11,565	0.87

¹ Other includes commercial and industrial, insurance and other loans.

Deposits

Information regarding average deposits balances and average interest rates on deposits is outlined in the table of Financial Condition above.

For purposes of the disclosure of uninsured time deposits, the residual amount of total time deposits vs insured time deposits has been considered. Insured time deposits have been identified considering both statutory and voluntary deposit protection schemes in each relevant jurisdiction. Below is an overview of the deposit protection schemes applicable for Deutsche Bank in its home country Germany:

Statutory depositor protection is stipulated by European directives in the European Union. These directives have been transformed into national law by the Deposit Guarantee Act (Einlagensicherungsgesetz, or EinSiG) in Germany. The statutory guarantee scheme ensures entitlement to compensation amounting up to €100k per depositor across all types of deposits – demand, time, and savings deposits – from selected depositors such as private individuals, partnerships, and corporations outside the financial industry.

The statutory deposit guarantee scheme is supplemented by a voluntary deposit guarantee fund established by the Federal Association of German Banks (BdB). This additional scheme protects deposits from private individuals, partnerships, and corporations outside the financial industry, covering current, time, and savings deposits, to the extent these are not already covered by the statutory compensation scheme, up to a coverage level per depositor of 15 % of the bank's own funds.

For this disclosure, across all domestic and foreign branches of Deutsche Bank AG, deposits from banks were considered 100 % uninsured, deposits from retail clients 100 % insured. For deposits from other depositors, a fixed percentage based on the proportion of time deposits to total deposits covered under the German statutory deposit guarantee scheme has been applied to estimate non-insured time deposits for this client group. All remaining entities of the Deutsche Bank group have determined the amount of uninsured time deposits following local requirements. As of year-end 2022, the group did not have any time deposits under FDIC insurance coverage on its books.

in € m.	Dec 31, 2022
U.S. time deposits in excess of FDIC insurance limit or similar state deposit insurance regimes	0
Time deposits that are otherwise uninsured, by maturity	
3 months or less	22,245
over 3 months to 6 months	13,846
over 6 months to 12 months	12,149
over 12 months	18,185
Total Time deposits that are otherwise uninsured	66,425
Total Uninsured time deposits	66,425

Total deposits by foreign depositors in German offices were € 51.8 billion, € 55.7 billion and € 44.8 billion as of December 31, 2022, 2021 and 2020, respectively.

Imprint

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