Genossenschaftliche FinanzGruppe
Volksbanken Raiffeisenbanken

December 31, 2022

Regulatory risk report (Pillar 3) of the DZ BANK banking group

DZ BANK Gruppe

Contents

1 Basis of regulatory risk reporting

1.1 Legal basis

The Basel Committee on Banking Supervision has created a global regulatory framework called Basel III setting out international standards for the capital adequacy and liquidity of banks. This framework was implemented into European law by Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms **(Capital Requirements Directive, CRD)** and the amended version of **Regulation (EU) No. 575/2013 (Capital Requirements Regulation, CRR)**.

This report fulfills the quantitative and qualitative requirements in respect of regulatory disclosure that are defined in articles 431 to 455 (Part 8) CRR. **Implementing Regulation (EU) 2021/637 laying down implementing technical standards with regard to public disclosures by institutions of the information referred to in Titles II and III of Part Eight of Regulation (EU) No. 575/2013** applies in addition to the CRR along with various other regulatory standards applicable to disclosure. Implementing Regulation (EU) 2021/637 sets out the CRR disclosure requirements in more detail by providing specific requirements and formats, in particular by stipulating the templates and tables to be used.

As the parent company (EU parent institution) of the DZ BANK banking group (pursuant to section 10a (1) of the German Banking Act (KWG)), DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main, (DZ BANK) has fulfilled its disclosure requirement (pursuant to article 436 sentence 1 letter a CRR) by publishing this **regulatory risk report**, consolidated at banking group level, as at December 31, 2022.

The disclosures in this report, which is based on the DZ BANK banking group, covers the following:

- **Own funds, capital requirements, and capital ratios**
- **Macroprudential regulatory measures, such as the countercyclical capital buffer and the indicators of global systemic importance**
- **Credit risk, including counterparty credit risk**
- **Non-performing loans (NPLs)**
- **Action in response to the COVID-19 crisis**
- **Securitizations**
- **Market risk**
- **Interest-rate risk in the banking book**
- **Operational risk**
- **Business risk and reputational risk**
- **Liquidity coverage ratio (LCR)**
- **Net stable funding ratio (NSFR)**
- **Leverage ratio**
- **Asset encumbrance (AE)**
- **Environmental, social, and corporate governance risks (ESG risks)**
- **Remuneration policy**

In the year under review, there was no intragroup financial support that would have had to be disclosed pursuant to **section 35 of the German Bank Recovery and Resolution Act (SAG)**.

In line with article 434 CRR, DZ BANK publishes the regulatory risk report on its website in the Investor Relations section under Reports, along with the annex on capital instruments (template EU CCA).

There is no statutory requirement for the regulatory risk report to contain an independent auditor's report, so no such report is included.

1.2 Implementation in the DZ BANK banking group

(Article 431 (3), article 432, and article 433 CRR)

This regulatory risk report comprehensively describes the risk profile of the DZ BANK banking group as at the reporting date by fulfilling all CRR disclosure requirements relevant to the banking group, while taking account of the principle of materiality pursuant to article 432 (1) CRR. The exemptions pursuant to article 432 (1) CRR are not used.

As well as the **concept of materiality** for determining material disclosures, regulatory risk reporting is based on the **disclosure policy** approved by the Board of Managing Directors. This policy sets out the principles and fundamental decisions for the methods, organizational structure, and IT systems to be used for disclosure in the DZ BANK banking group. The disclosure policy also governs the integration of risk disclosure into general financial disclosure and provides the link to internal risk reporting. With this policy, DZ BANK has implemented a formal process in which the operational steps – from preparing the report to obtaining the adoption of a resolution by the Board of Managing Directors and publishing the report – are defined, along with the required controls. This process also sets out all roles and responsibilities. The policy is audited regularly to assess whether it remains appropriate and is amended in line with changes to internal and external circumstances, thereby complying with the requirements of article 431 (3) CRR.

The Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) [German Federal Financial Supervisory Authority] has classified DZ BANK as an other systemically important institution (O-SII) since 2016. Moreover, the institution operates in the capital markets. The DZ BANK banking group is classified as a large institution, so the **frequency and scope** of the regulatory risk report is determined by article 433a CRR.

To ensure the necessary transparency for market participants, **comparative figures** as at previous reporting dates or relating to a previous period are disclosed. Any significant changes – particularly to quantitative disclosures – between the reporting periods are explained (article 431 (4) CRR).

Unless otherwise indicated, all quantitative information in this report relates to the **entities consolidated for regulatory purposes in the DZ BANK banking group** as at the reporting date pursuant to section 10a KWG in conjunction with articles 11 to 18 CRR (prudential consolidation). The qualitative information in this report relates to the material subsidiaries in the DZ BANK banking group. Materiality is determined on the basis of the materiality concept that is used in the commercial-law risk report. The risk types and risk capital requirements that are measured in the DZ BANK Group, combined with the limits set for the risk and buffer capital amounts by the individual management units, are used to determine materiality in this context.

The material subsidiaries (management units) in the DZ BANK banking group that are consolidated for regulatory purposes are listed below:

– DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main (DZ BANK)
– Bausparkasse Schwäbisch Hall AG, Schwäbisch Hall, (Bausparkasse Schwäbisch Hall; subgroup abbreviated to BSH)
– DZ HYP AG, Hamburg and Münster, (DZ HYP)
– DZ PRIVATBANK S.A., Strassen, (DZ PRIVATBANK S.A.; subgroup abbreviated to DZ PRIVATBANK)
– TeamBank AG Nürnberg, Nuremberg, (TeamBank)
– Union Asset Management Holding AG, Frankfurt am Main, (Union Asset Management Holding; subgroup abbreviated to UMH)
– VR-Smart Finanz Aktiengesellschaft, Eschborn, (VR Smart Finanz AG; subgroup abbreviated to VR Smart Finanz)

Following an entry in the commercial register on August 12, 2022, DVB Bank SE (DVB) was retrospectively merged into DZ BANK with effect from January 1, 2022 and therefore is no longer a material subsidiary. The risks relating to DVB have passed to DZ BANK and have been integrated into DZ BANK's management processes and its internal and external reporting.

In accordance with article 13 (1) CRR, **large subsidiaries** must disclose the information specified in article 437 CRR (own funds), article 438 CRR (capital requirements and risk-weighted exposure amounts), article 440 CRR (countercyclical capital buffer), article 442 CRR (credit risk and dilution risk), article 450 CRR (remuneration policy), article 451 CRR (leverage ratio), article 451a (liquidity requirements), and article 453 CRR (use of credit risk mitigation techniques) on an individual basis or, where necessary, on a sub-consolidated basis.

To identify and categorize subsidiaries as large, the criteria in article 4 (1) no. 147 CRR are applied to those subsidiaries classified as a credit institution or investment firm under the CRR. The subsidiaries identified must comply with the requirements in article 13 CRR unless they are covered by the **waiver** pursuant to article 7 CRR. The disclosures required for these subsidiaries on the basis of article 13 CRR can be found in the regulatory risk reports on the websites of the subsidiaries in question.

BSH is required to publish its own disclosure report in accordance with article 13 CRR because it is classified as a large institution. Under the rules in article 13 CRR concerning disclosure requirements for subsidiaries, TeamBank and DZ PRIVATBANK are exempt from publishing their own disclosure reports because they are not deemed to be large institutions.

This disclosure requirement is waived on an individual basis in accordance with article 7 CRR for DZ HYP and in accordance with section 2 (7) KWG for UMH and VR Smart Finanz.

To calculate the **regulatory capital requirements** pursuant to the CRR, the DZ BANK banking group mainly applies the foundation internal ratings-based approach (IRB approach or IRBA) for credit risk.

The regulatory credit risk measurement methods used by DZ BANK, BSH, DZ HYP, TeamBank, and DZ PRIVATBANK are based on the foundation IRB approach. The IRB approach is used to calculate the credit risk of the retail businesses of BSH, DZ HYP, TeamBank, and DZ PRIVATBANK although the probability of default (PD) and the loss given default (LGD) are based on internal accounting estimates.

Capital requirements for market risk are predominantly measured using internal calculation models and, to a minor extent, the regulatory Standardized Approaches. The Standardized Approach is used at the DZ BANK banking group level to determine operational risk in accordance with regulatory requirements, while the individual institutions are responsible for their own calculations and reporting (as a rule the Standardized Approach, although the Basic Indicator Approach is possible in exceptional cases) in accordance with article 315 et seq. CRR.

Unless indicated otherwise, the quantitative disclosures in this risk report are rounded to the nearest whole million euros. This may give rise to small discrepancies between the totals shown in the tables, diagrams, and text passages and totals calculated from the individual values shown. Table cells with a dark gray background are not relevant for disclosure purposes. The symbol – is used to indicate that a line item in a table has no value. If a line item (after rounding) amounts to less than €1 million, a value of 0 is disclosed.

In its Pillar 3 reporting, DZ BANK aims to ensure the **consistency and comparability of disclosures** over time at the level of the DZ BANK banking group and to contribute to consistency and comparability across the industry. The quantitative disclosures in this report are therefore based, in particular, on the requirements in Implementing Regulation (EU) 2021/637.

On June 24, 2020, the European Commission adopted a regulation amending the CRR in response to the COVID-19 pandemic (Regulation (EU) 2020/873) and published it in the EU's Official Journal on June 26, 2020. Given the urgency of the measures, the regulation took effect on the day after it was published in the EU's Official Journal. The package of measures is also referred to as the CRR 'quick fix' and includes, for example, options relating to adjustment of the transitional provisions resulting from the introduction of IFRS 9 (article 473a CRR) and options relating to the temporary treatment of unrealized gains and losses measured at fair value through other comprehensive income (article 468 CRR).

The following requirements are currently not relevant to the DZ BANK banking group, and the corresponding data has therefore not been included in this regulatory risk report:

– Disclosure of the alpha factor pursuant to article 439 sentence 1 letter k CRR is not necessary since no internal DZ BANK banking group models approved by the supervisory authority were used in 2022 to calculate capital requirements for derivative counterparty risk exposure.
– The same applies to securitizations under the early amortization approach. Such securitizations were not carried out by entities in the DZ BANK banking group during the reporting year, nor are they part of any existing business.
– In the case of risk in connection with fair value changes in the correlation trading portfolio (CTP, article 455 sentence 1 letter a (ii) CRR), no internal model approved by the supervisory authority is currently available, so the capital requirements for these exposures are calculated using the Standardized Approach.
– An RWEA flow statement for counterparty credit risk under the internal model method (IMM; template EU CCR7) is not included, as DZ BANK does not have an IMM for this risk.
– As the banking group's operational risks are calculated in accordance with the Standardized Approach, there are no disclosures about the use of Advanced Measurement Approaches for operational risk (article 454 CRR).

1.3 Risks covered in the regulatory risk report

The regulatory risk report covers the risk types listed in section 1.1 for the subsidiaries that must be consolidated as part of the DZ BANK banking group for regulatory purposes in accordance with article 4 (1) no. 16 CRR and section 10a (4) and (5) KWG.

Regulatory capital requirements relate to the following risk types: credit risk, market risk, and operational risk. In addition to these risk types, the technical risk of a home savings and loan company, actuarial risk, and business risk are also backed by economic risk capital as part of the internal economic capital management process (Pillar 2). The internal model for determining market risk in Pillar 2 is based on the internal model for calculating regulatory market risk.

There are no regulatory capital requirements for liquidity risk. Economic liquidity adequacy is managed on a daily basis using an internal liquidity risk measurement and management process.

There are also **differences between economic and regulatory risk coverage**, in particular:

– When the regulatory capital requirements and the related disclosures are being determined, risk-bearing exposures are treated differently in terms of quantification of their risk depending on whether they are allocated to the trading book or banking book. No such distinction is made for internal management purposes. For example, on-balance-sheet and off-balance-sheet exposures in the banking book and counterparty risk arising from derivatives exposure in the banking book and trading book are classified under credit risk. The issuer-related exposures in the trading book are treated as market risk exposures and are therefore backed with regulatory own funds, whereas they are treated as issuer risks and classified under credit risk for internal management purposes.
– As a result of this approach, the **credit risk exposures** presented in this risk report are based on regulatory bases of assessment and therefore differ from the presentation in the commercial-law risk report, which is based on figures in the internal management accounts.
– Furthermore, equity investment risk is recognized as a separate type of risk in the internal management accounts. Credit risk and equity investment risk are determined in the internal management accounts using different portfolio models.
– The market risk disclosed using the methods in Pillar 1 essentially corresponds to the market risk managed on the basis of the rules of Pillar 2. In the context of the economic management of market risk, interest-rate risk also includes interest-rate risk in the banking book for which no backing with own funds is required for regulatory purposes under Pillar 1.
– In the DZ BANK banking group, the Standardized Approach was used as at December 31, 2022 to calculate the regulatory own funds (as described in section 1.2 above) for operational risk in accordance with article 317 et seq. CRR. In respect of the economic capital requirements, however, a statistical model is used for the management units that satisfies the criteria for an Advanced Measurement Approach (AMA). The results from this portfolio model, combined with the materiality limits for collation of loss data, scenario-based risk self-assessments, and risk indicators, are used to manage operational risk.

1.4 Developments in relation to transparency rules in banking regulation

Implementing Regulation (EU) 2022/2453 was published on December 19, 2022 and relates to the disclosure of environmental, social, and corporate governance risks. It specifies the disclosure requirements in Part 8 CRR pertaining to the disclosure of sustainability risks (ESG risks) in accordance with article 449a CRR. Detailed information on ESG risks was required to be published for the first time as at December 31, 2022.

The European Banking Authority (EBA) published a consultation paper (EBA/CP/2019/14) on the disclosure and reporting of the standard minimum requirement for the total loss-absorbing capacity of global systemically important institutions (TLAC) and the minimum requirement for own funds and eligible liabilities (MREL) on November 22, 2019. The consultation period ended on February 22, 2020. The final version, EBA/ITS/2020/06, was published as Implementing Regulation (EU) 2021/763 in the Official Journal of the European Union on May 12, 2021. The requirements regarding TLAC disclosure have had to be applied since June 28, 2021; the requirements regarding MREL disclosure have to be applied with effect from January 1, 2024.

The requirements regarding disclosure of exposures to interest-rate risk on positions not held in the trading book (article 448 CRR) were further specified in EBA/ITS/2021/07. The final draft of the ITS was published as Implementing Regulation (EU) 2022/631 in the Official Journal of the European Union on April 19, 2022.

On October 27, 2021, the European Commission presented a draft for an EU banking package finalizing the Basel III framework (known informally as Basel IV) that is to be implemented into European law, along with other matters, by CRR III. The CRR III draft is currently at the preparation stage in the trilogue negotiations between the European Commission, European Parliament, and European Council and is scheduled to come into force on January 1, 2025.

2 Risk management, objectives, and rules

(Article 435 CRR)

2.1 Principles and objectives of risk management

Table EU OVA – Institution risk management approach
(Article 435 (1) CRR)

2.1.1 Risk management objectives and policies for each individual risk category

(Article 435 (1) CRR)

A description of the overarching risk management objectives and policies of the DZ BANK banking group is provided below. Detailed information on risk management objectives and policies for the individual risk types can be found in sections 2.1.2.1 (equity investment risk), 6.1 (credit risk), 8.2 (market risk), 9.2 to 9.4 (operational risk), 10.3 (business risk), 10.5 (reputational risk), and 11.2 (liquidity risk) of this report.

Regulatory framework for risk management

The **DZ BANK Group's risk management system** takes into account the statutory requirements specified in section 25 (1) of the German Supervision of Financial Conglomerates Act (FKAG) in conjunction with section 25a KWG and the German Minimum Requirements for Risk Management for Banks and Financial Services Institutions (MaRisk BA). In respect of risk management for the relevant management units, the DZ BANK Group also observes the requirements specified in sections 26 and 27 of the German Act on the Supervision of Insurance Undertakings (VAG) and section 28 of the German Capital Investment Code (KAGB) in conjunction with the German Minimum Requirements for Risk Management for Investment Management Companies (KAMaRisk).

When the DZ BANK Group designed the risk management system, it followed the guidance provided by the EBA and the European Insurance and Occupational Pensions Authority (EIOPA), together with the pronouncements of the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB) on risk management issues.

In the reporting year, DZ BANK updated its group recovery plan for the DZ BANK Group in accordance with the requirements specified by banking supervisors and submitted it to the European Central Bank (ECB). The recovery plan is based on the requirements specified in the German Bank Recovery and Resolution Act (SAG) and in other legal sources, especially Commission Delegated Regulation (EU) 2016/1075, various EBA guidelines, and the German Regulation on Minimum Requirements for the Design of Recovery Plans (MaSanV).

In accordance with article 7 (2) of Regulation (EU) No. 806/2014, the Single Resolution Board (SRB) is the European regulator responsible under the Single Resolution Mechanism (SRM) for the preparation of resolution plans and for all decisions in connection with the resolution of all institutions that are under the direct supervision of the ECB. A group resolution plan is drawn up for institutions that are subject to supervision at consolidated level. The SRB works closely with the national resolution authorities (in 2022 in Germany, this was BaFin). The resolution plan is aimed at ensuring the resolvability of the banking group. In accordance with section 42 (1) SAG, the resolution authority (BaFin) can demand that the institution provide it with comprehensive assistance in connection with drawing up and updating the resolution plan. For this reason, as in prior years, DZ BANK once again in 2022 supported the ongoing preparation of the resolution plan for the DZ BANK Group. It supplied the resolution authority with numerous analyses related to DZ BANK and completed standardized questionnaires.

2.1.2 Strategies and processes for the management of risk
(Article 435 (1) letter a CRR)

2.1.2.1 Risk strategies
(Article 435 (1) letter a CRR)

The **systematic controlled assumption of risk in relation to target returns** is an integral part of corporate control in the DZ BANK Group. The activities resulting from the business model require the ability to identify, measure, assess, manage, monitor, and communicate risks.

The need to hold appropriate reserves of cash and to cover risks with adequate capital is also recognized as an essential prerequisite for the operation of the business and is of fundamental importance.

For each of the material risks, the Board of Managing Directors of DZ BANK draws up risk strategies that are linked to the **business strategy**. The risk strategies each encompass the main risk-bearing business activities, the objectives of risk management (including the requirements for accepting or preventing risk), and the action to be taken to attain the objectives. The risk strategies are each valid for one calendar year.

The annual updating of the risk strategies is integrated with the **strategic planning process** and is carried out by the Group Risk Controlling, Group Risk Management & Services, and Group Finance divisions in close consultation with other relevant divisions at DZ BANK and its subsidiaries.

Equity investment risk

Equity investment risk is defined as the risk of losses arising from negative changes in the fair value of that portion of the long-term equity investments portfolio for which the risks are not included in other types of risk. Equity investment risk also includes the risk of losses arising from negative changes in the fair value of the real estate portfolio caused by a deterioration in the general real estate situation or specific factors relating to individual properties (such as a vacancy period, tenant default, loss of use).

In the Bank sector, equity investment risk arises primarily at DZ BANK, BSH, and TeamBank.

The entities in the Bank sector hold long-term equity investments largely for strategic reasons, especially to cover markets, market segments, or parts of the value chain in which they themselves or the cooperative banks are not active. These investments therefore support the sales activities of the cooperative banks or help reduce costs by bundling functions. The investment strategy is continuously aligned with the needs of cooperative financial network policy.

Risk strategy requirements must be observed in the management of long-term equity investments. Such management is subject to the principle that equity investment risk (measured as risk capital requirement) may be taken on only if the risk remains below the existing limits.

Decisions on whether to acquire or dispose of **long-term equity investments** are made by the Board of Managing Directors of the entities in the Bank sector in consultation with the relevant committees.

At DZ BANK, the Group Finance division is responsible for **supporting these investments**, whereas at BSH the task falls within the scope of the Central Services/Policy/International division and the Financial Controlling division. At TeamBank, the investments are mainly the responsibility of the Corporate Development division.

Equity investment risk in the Bank sector is **measured and monitored** by DZ BANK. The Board of Managing Directors is kept up to date through the overall risk reports.

Key factors when determining equity investment risk are the equity investment's industry sector, the location of its registered office, and the nominal amount of the investment. The possibility cannot be ruled out that a future impairment test on the long-term equity investments held by the entities in the Bank sector could lead to a significant reduction in the carrying amounts of these investments reported on the balance sheet. In the case of non-controlling interests, there is also a risk that key information may not be available or cannot be obtained promptly by virtue of the fact that the investment is a minority stake and this could result in a need to recognize impairment losses.

The carrying amounts of the long-term equity investments are regularly tested for possible impairment in the last quarter of the financial year. If there are any indications during the course of the year of possible impairment, more frequent impairment tests are also carried out. In the impairment tests, the carrying amounts of the long-term equity investments are compared against the amount that could be realized on the market on the same date.

The risk capital requirement for the vast majority of the long-term equity investments in the Bank sector is determined using a Monte Carlo simulation (portfolio risk measurement). In this method, portfolio concentrations in sectors and individual counterparties are taken into account by simulating industry-wide and individual investment-related risk factors. The risk capital requirement is influenced, in particular, by the market values of the long-term equity investments, the volatility of the market values, and the correlations between the market values, with market price fluctuations mainly derived from reference prices listed on an exchange. For a minority of the long-term equity investments, a look-through approach is taken in which the individual risk types that exist in each long-term equity investment are measured (differentiated risk measurement).

2.1.2.2 Risk appetite

(Article 435 (1) letter a CRR)

The entities in the DZ BANK Group define risk appetite as the nature and extent of the risks that will be accepted at group level or by the management units within their risk capacity when implementing their business models and business objectives. Risk capacity is the maximum risk that the DZ BANK Group can take on based on its capital adequacy, liquidity adequacy, capacity for risk management and control, and regulatory restrictions. Risk capacity is therefore largely determined by the DZ BANK Group's available internal capital, own funds, and available liquid assets.

Risk appetite equates to the term '**risk tolerance**' used by the supervisory authorities in a disclosure context.

The **risk appetite statement** formulates risk policy principles on risk tolerance in the DZ BANK Group. The principles are overarching statements that are consistent with the business model and the risk strategies. The qualitative principles are supplemented by quantitative key figures, for which threshold values are set internally. The overall risk report is used to monitor the internal threshold values.

2.1.3 Description of the structure and organization of the risk management function, including information on its authority and status or other appropriate arrangements

(Article 435 (1) letter b CRR)

Governance structure

The DZ BANK Group's risk management system builds on the risk appetite statement and risk strategies. It is based on three lines of defense that are interlinked and well established in the monitoring and control environment. Fig. 1 shows the governance structure for **risk management**.

The **three-lines-of-defense model** clarifies the understanding of risk management within the DZ BANK Group and sets out the roles and responsibilities.

The interaction between the three functional areas, or lines of defense, is intended to provide the basis for effective groupwide risk management. The tasks of the individual lines of defense are as follows:

First line of defense:

- Day-to-day assumption and management of risk; related reporting to the Board of Managing Directors

Second line of defense:

- Establishment and enhancement of a framework for risk management
- Monitoring of compliance with the framework in the first line of defense and related reporting to the Supervisory Board and Board of Managing Directors
- Second vote in credit decisions as defined in MaRisk BA and KAMaRisk
- Development and monitoring of principles for compliance with data protection requirements and structuring and monitoring of corporate security. These rules do not limit the data protection officers' freedom to operate independently.
- The tasks listed are primarily carried out by the Group Risk Controlling, Group Risk Management & Services, Credit, and Compliance divisions. They are also part of the remit of the Group IT Governance department.
- The Group Risk Controlling, Group Risk Management & Services, and Credit divisions together form the risk management function.

Third line of defense:

- Process-independent examination and assessment of risk management and control processes in the first and second lines of defense
- Reporting to the Board of Managing Directors, Supervisory Board, and Audit Committee
- Communication with external control functions

Independent auditors, together with banking and insurance supervisory authorities, form the **external control functions** and these functions regularly hold discussions with all three lines of defense. The supervisory authorities can specify key points to be covered by independent auditors in their audits of financial statements. The auditors report to the supervisory authorities on the findings of their audits of financial statements and special audits.

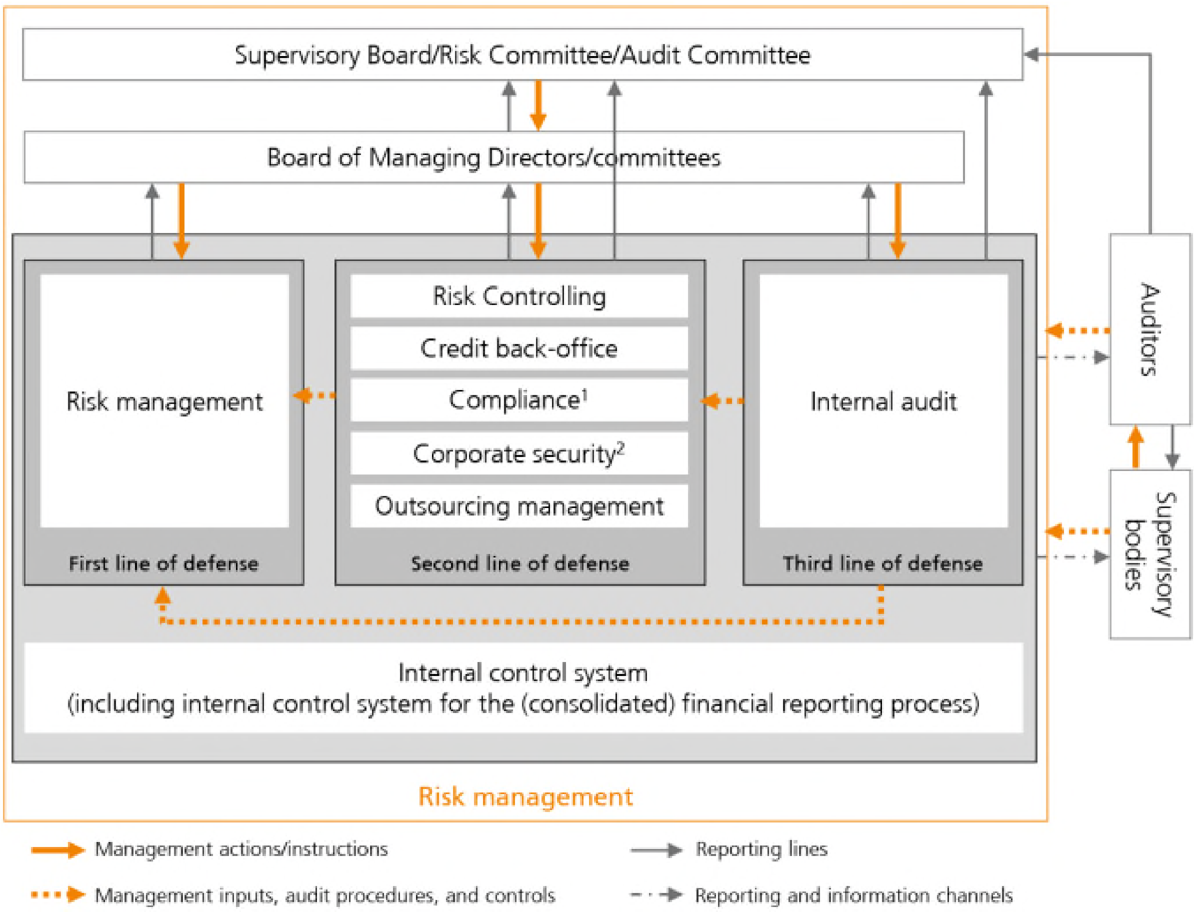
Risk management is an integral component of governance and is therefore taken into account in the general management approach, in the management of subsidiaries via appointments to key posts, and in the DZ BANK Group's committees.

Risk management

Risk management refers to the operational implementation of the risk strategies based on standards applicable throughout the group.

The management units make conscious decisions on whether to assume or avoid risks. They must observe guidelines and risk limits specified by the head office. The divisions responsible for risk management in the first line of defense are separated in terms of both organization and function from the divisions in the second and third lines of defense.

FIG. 1 – GOVERNANCE STRUCTURE OF RISK MANAGEMENT IN THE DZ BANK GROUP (SCHEMATIC DIAGRAM)



1 Including data protection.
2 Including information security and business continuity management.

Risk control

The Group Risk Controlling and Group Risk Management & Services divisions, which form DZ BANK's central risk control function, are responsible for identifying, measuring, and assessing risk in the DZ BANK Group. This role includes early detection, full recording of data (to the extent that this is possible), and internal monitoring for all material risks. The risk control function lays down the fundamental requirements for the risk measurement methods to be used throughout the group and coordinates implementation with the risk control functions in the other management units. This structure is designed to ensure that risk is managed consistently throughout the group. DZ BANK's risk control function also draws up groupwide rules for the credit risk processes.

Both at DZ BANK and in the other management units, the risk control function is responsible for the transparency of risks assumed and aims to ensure that all risk measurement methods used are up to date. In cooperation with the other management units, the risk control function at DZ BANK therefore prepares groupwide risk reports covering all material types of risk based on specified minimum standards using methods agreed between the management units. The risk reports are compiled for the Supervisory Board and the Board of Managing Directors of DZ BANK and for the other management units.

The risk control units in the management units monitor compliance with the limits defined for the minimum liquidity surplus and with the entity-related limits that have been set based on the risk capital allocated by DZ BANK.

Credit back-office division

The Credit divisions of the entities in the Bank sector form the back office within the meaning of MaRisk. They are responsible for aspects of identifying, measuring, monitoring, and managing credit risk. These aspects include analyzing the risk (including ratings), approving or rejecting a credit decision with the back office's 'second vote', ensuring compliance with the credit risk strategy, and identifying and appropriately assessing the risks from loans to members of the governing bodies. The responsibilities of the back office also comprise the ongoing monitoring of loan exposures, including identifying and processing non-performing exposures and deciding on measures to be implemented if limits are exceeded, as well as the management of loan collateral. In the case of exposures that are relevant for management, the exposure throughout the group is taken into account and appropriate management guidance is given to the management units.

Compliance function

The Board of Managing Directors of DZ BANK and the Boards of Managing Directors of the other management units are responsible for compliance with legal provisions and requirements and with the principles and measures implemented for this purpose. To fulfill these duties, the Boards of Managing Directors generally appoint an independent compliance function.

The main tasks of the compliance function are to identify, manage, and mitigate compliance risk in order to protect customers, the entities in the DZ BANK Group, and their employees against breaches of legal provisions and requirements. The compliance function is also responsible for monitoring compliance with legal provisions, external and internal agreements, and internal standards. Other tasks of the compliance function are to keep senior management up to date with new regulatory requirements and to advise the departments on implementing new provisions and requirements.

In accordance with the requirements of the Supervisory Review and Evaluation Process for Basel Pillar 2 (SREP), there is a single compliance framework for the main entities in the DZ BANK Group. This framework lays down rules on cooperation between the individual compliance functions and sets out their authority and responsibilities. The compliance framework comprises the compliance policy of the DZ BANK Group and compliance standards. The compliance policy sets out requirements for establishing and organizing the compliance functions and details of their duties. It is supplemented by compliance standards, which specify how to implement these requirements at an operational level. If individual requirements in the compliance standards cannot be fulfilled by a management unit, for example because they conflict with local rules or special legal requirements, the affected management unit must provide an explanation. Special circumstances may arise because R+V is subject to different legal and regulatory requirements. The DZ BANK Group's compliance framework is reviewed annually to check that it is up to date.

Code of conduct

The risk culture principles are mirrored in the DZ BANK Group's code of conduct. The code of conduct represents a framework for the group entities, the details of which are implemented by means of internal regulations and policies in the management units according to their respective core businesses and entity-specific requirements.

The code of conduct encompasses the responsibility to stakeholders who are directly affected by the management unit concerned. These stakeholders include customers, business partners, shareholders, and employees. Compliance with social and ethical standards also forms part of the code of conduct, as do aspects of sustainability.

The subsidiaries of DZ BANK have undertaken to comply with DZ BANK's standards on preventing money laundering, the financing of terrorism, and other criminal offenses where required by law. The measures required by the German Anti-Money Laundering Act (GwG) have been put in place and implemented. They are reviewed regularly to check that they are up to date and, if necessary, amended. No corruption is tolerated, either in the entities of the DZ BANK Group or at business partners or other third parties. The DZ BANK Group implements appropriate organizational arrangements designed to ensure compliance with all applicable sanctions and embargoes.

Internal audit

The internal audit departments of the management units are responsible for control and monitoring tasks. Independently of individual processes and with a focus on risk, they review and assess compliance with statutory and regulatory requirements and the effectiveness and appropriateness of risk management in general and the internal control system in particular. They also check that all activities and processes are carried out properly, regardless of whether they are outsourced or not. The internal audit departments also ensure that problems identified in audit findings are rectified.

The internal audit departments at the entities in the DZ BANK Group report to the chief executive officer or other senior managers of the entity concerned.

DZ BANK's internal audit department is responsible for internal audit tasks at group level. These tasks include, in particular, the design and coordination of audits involving multiple entities, the implementation of which lies within the remit of the individual internal audit departments in the management units concerned, and the evaluation of individual management unit audit reports of relevance to the group as a whole. Cooperation between internal audit departments in the DZ BANK Group is governed by general parameters, the operational details of which are set out in a separate group audit manual. DZ BANK's internal audit department also carries out audit activities for selected subsidiaries under service agreements.

Supervisory Board

Information on the Supervisory Board can be found in section 2.6 'Information flow to the Board of Managing Directors and Supervisory Board' of this report.

External control functions

Independent **auditors** carry out audits pursuant to section 29 (1) sentence 2 no. 2a KWG in conjunction with section 25a (1) sentence 3 KWG in relation to the risk management system, including the internal control functions, of the entities in the Bank sector.

The **banking supervisory authority** also conducts audits focusing on risk.

General internal control system

The objective of the internal control systems operated in the entities of the DZ BANK Group is to ensure the effectiveness and efficiency of business activity and compliance with the relevant legal provisions by means of suitable basic principles, action plans, and procedures.

DZ BANK has a bank-wide internal control system that is able to adapt to changing business and operating environments. The methodology of this control system is based on the Internal Control – Integrated Framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO), a comprehensive and internationally accepted framework for the appropriate design of internal control systems.

As part of the control system, regular updates and assessments are carried out in respect of the internal controls for reducing material risk in the business processes documented in the written set of procedural rules. The outcome of the assessments provides a statement on the appropriateness and effectiveness of the bank-wide internal control system for the Board of Managing Directors and Supervisory Board. The organizational and technical measures integrated into DZ BANK's operational and organizational structure are the starting point for the design of the controls.

2.1.4 Scope and nature of risk reporting and measurement systems

(Article 435 (1) letter c CRR)

A general description of the risk reporting and measurement systems of the DZ BANK banking group is provided below. Detailed information on risk reporting and on risk measurement systems for the individual risk types can be found in sections 2.1.2.1 (equity investment risk), 6.1.2 and 6.1.4 (credit risk), 8.2.2 and 8.2.3 (market risk), 9.3 and 9.4 (operational risk), 10.3 and 10.4 (business risk), 10.5.3 (reputational risk), and 11.2.3 and 11.2.5 (liquidity risk) of this report.

Accounting basis for risk measurement

The transaction data that is used to prepare the DZ BANK Group's consolidated financial statements forms the basis for the measurement of risk in the Bank sector. Similarly, the transaction data used by the entities in the DZ BANK Group to prepare separate financial statements and subgroup financial statements is also used for the measurement of risk in the management units. A wide range of other factors are also taken into account in the calculation of risk.

The calculation of **liquidity risk** is derived from future cash flows, which in general terms are determined from all of the on-balance-sheet and off-balance-sheet items in the consolidated financial statements.

Measurement of risk and risk concentrations

Risk management in the DZ BANK Group is based on a **resource-oriented perspective of liquidity and capital**. The group uses this approach to implement the regulatory requirements for the internal liquidity adequacy assessment process (ILAAP) and the internal capital adequacy assessment process (ICAAP). This involves dovetailing between the economic and normative internal perspectives within the ILAAP and ICAAP.

A distinction is also made between **economic and normative liquidity adequacy and between economic and normative capital adequacy**. The impact of each risk type on both economic capital and economic liquidity is taken into consideration. The effect and materiality of the various types of risk may vary, depending on the resource in question.

Limitation principles

The DZ BANK Group has implemented a system of limits to ensure that it retains an adequate level of liquidity and maintains its risk-bearing capacity. A system of limits and pre-set threshold values aims to ensure that the **liquidity surplus** at the level of the DZ BANK Group does not become a shortfall and therefore that an adequate level of liquidity is guaranteed.

In the case of **risks backed by capital**, the limits take the form of risk limits or volume limits, depending on the type of business and type of risk. Whereas risk limits in all types of risk restrict exposure measured with an economic model, volume limits are applied additionally in transactions involving counterparties. Risk management is also supported by limits for relevant key performance indicators. Specific amendments to risk positions based on an adjustment of the volume and risk structure in the underlying transactions are intended to ensure that the measured exposure does not exceed the approved volume and risk limits. Risks that are incurred are compared with the limits allocated to them and undergo monitoring.

Hedging objectives and hedging transactions

Hedging activities can be undertaken where appropriate in order to transfer credit risk, market risk, and operational risk to the greatest possible extent to third parties outside the DZ BANK banking group. All hedging activities are conducted within the strategic rules specified in writing and applicable throughout the group. Derivatives and other instruments are used to hedge credit risk and market risk.

If the hedging of risk in connection with financial instruments gives rise to **accounting mismatches** between the hedged item and the derivative hedging instrument used, the DZ BANK Group designates the hedging transaction as a hedge in accordance with the hedge accounting requirements of IFRS 9 in order to eliminate or reduce such mismatches. The DZ BANK Group continues to account for portfolio hedges in application of the rules under IAS 39. Hedge accounting in the DZ BANK Group encompasses the hedging of interest-rate risk.

The **risk manual**, which is available to all employees of the management units, sets out the general parameters for identifying, measuring, assessing, managing, monitoring, and communicating risks. These general parameters are intended to ensure that risk management is properly carried out in the DZ BANK Group. The manual forms the basis for a shared understanding of the minimum standards for risk management throughout the group.

Risk inventory and appropriateness test

Every year, DZ BANK draws up a **risk inventory**, the objective of which is to identify the types of risk that are relevant for the DZ BANK Group and assess the materiality of these risk types. According to need, a risk inventory check may also be carried out at other times in order to identify any material changes in the risk profile during the course of the year. A materiality analysis is carried out for those types of risk that could arise in connection with the operating activities of the entities in the DZ BANK Group. The next step is to assess the extent to which there are concentrations of risk types classified as material in the Bank sector, the Insurance sector, and across sectors.

DZ BANK also conducts an annual **appropriateness test**, both for itself and at DZ BANK Group level. The appropriateness test may also be carried out at other times in response to specific events. The aim is to check whether the risk measurement methods used for all types of risk classified as material are in fact fit for purpose. The appropriateness test found that risk measurement in the DZ BANK Group is generally appropriate, although potential improvements to some aspects of risk measurement were identified.

The risk inventory check and appropriateness test are coordinated in terms of content and timing. All management units in the DZ BANK Group are included in both processes. The findings of the risk inventory and the appropriateness test are incorporated into the risk management process.

Risk inventory checks and appropriateness tests are generally conducted in a similar way for the material subsidiaries.

2.1.5 Guidelines for mitigating and hedging risk as well as strategies and procedures for monitoring the ongoing effectiveness of the measures taken to mitigate and hedge risk

(Article 435 (1) letter d CRR)

Detailed information on guidelines for mitigating and hedging risk as well as strategies and procedures for monitoring the ongoing effectiveness of the measures taken to mitigate and hedge risk for the individual risk types can be found in sections 6.1.3 (credit risk), 8.2.2 (market risk), 9.3 (operational risk), 10.3 (business risk), 10.5.3 (reputational risk), and 11.2.3 (liquidity risk) of this report.

2.1.6 Strategies and processes for the management of risk in the context of stress tests

(Article 435 (1) letters a to d CRR)

2.1.6.1 General information on stress testing

(Article 435 (1) letter a CRR)

The DZ BANK Group regularly conducts stress tests comprising scenarios for internal capital and risk management (ICAAP), capital planning, and liquidity management (ILAAP). Stress tests are also carried out as part of bank recovery and resolution planning. In addition, the DZ BANK Group participates in stress tests organized by the supervisory authorities, such as those of the EBA and ECB.

The aforementioned ICAAP stress tests are broken down into the groupwide stress tests for adverse stress scenarios, reverse stress tests, risk-type-specific stress tests, ad hoc stress tests, and the stress tests at the level of the management units (DZ BANK and the material subsidiaries).

In-depth discussions on the results of the stress tests are held regularly by DZ BANK's various steering committees, providing vital management input. Potential management action may consist of both business planning and liquidity- and capital-related measures. The regular tests of whether the stress tests are appropriate are generally integrated by means of the various scenarios.

The aforementioned stress tests cover all of the relevant portfolios within the risk types that are examined.

In addition to the risk measurements, the effects of extreme but plausible events are also analyzed. Stress tests of this kind are used to establish whether the DZ BANK Group can sustain its business models, even under extreme economic conditions. Stress tests are carried out in respect of liquidity, economic risk-bearing capacity, and regulatory capital ratios. They also help to identify and quantify specific risks and potential risk concentrations in the DZ BANK Group or in individual portfolios and to assess risk drivers, vulnerabilities, and threats.

The stress tests include scenarios for the purposes of liquidity management, capital planning, and internal capital and risk management. Stress tests are also carried out as part of bank recovery and resolution planning. Furthermore, the DZ BANK Group takes part in supervisory stress tests organized by the EBA and ECB. The outcome of the stress tests provides guidance for the management of risk, business planning, and decisions on liquidity measures or corporate action.

2.1.6.2 Information on risk management in respect of liquidity adequacy

(Article 435 (1) letter b CRR)

For information on risk management in respect of liquidity adequacy, see section 11.2.3 of this report.

2.1.6.3 Information on risk management in respect of capital adequacy

(Article 435 (1) letters b, c, and d CRR)

Adverse stress tests

Adverse stress tests are used to examine the impact on capital and risk from potential **crisis scenarios** that are exceptional, but plausible, and particularly relevant to the DZ BANK Group's value and risk drivers. The **KPIs** relating to economic and regulatory capital adequacy are analyzed in this context. However, the stress tests also reflect events that go beyond the methods established for calculating capital adequacy. The term 'adverse stress tests' encompasses those stress scenarios that represent negative macroeconomic trends or events from the perspective of the DZ BANK Group. In this context, 'adverse' indicates that the scenarios may be particularly disadvantageous or even harmful.

Adverse stress tests can provide information on whether the level of capital resources – especially the buffer held to cover crisis situations – is also sufficient to cover various types of moderate to serious crisis scenario. The stress test results also facilitate an assessment of the extent to which the analyzed value and risk drivers are material for the DZ BANK Group.

The methods used are designed so that the specific features of R+V's business model and its risk and capital management systems are taken into account when determining the results of stress testing in the DZ BANK Group.

For the adverse stress tests, DZ BANK has put in place a system of threshold values as an **early-warning mechanism**. The threshold values for the scenarios across all risk types are monitored in the ongoing reporting system. These early-warning signals trigger various risk management processes so that there can be an early response to the potential risks highlighted by the stress tests. Control measures potentially available for the crisis scenario in question are also taken into account so that there is a comprehensive, critical evaluation of the stress test results.

The adverse stress tests are carried out quarterly. The results are submitted in the DZ BANK Group stress tests report and are noted by the **Board of Managing Directors** and by the DZ BANK Supervisory Board's **Risk Committee**.

Reverse stress tests

Reverse stress tests complement the adverse stress tests and are used to investigate which of the hypothetical scenarios could conceivably be sufficiently plausible and relevant to jeopardize the ability of the DZ BANK Group to **continue as a going concern**.

'Reverse' indicates that the tests are in the opposite direction and distinguishes them from the adverse stress tests. In adverse stress tests, scenarios are defined and the corresponding KPIs determined in order to assess whether there is a sufficient level of capital resources available to cover moderate or serious crisis scenarios. Reverse stress tests, on the other hand, examine which scenarios would have to occur to jeopardize the survival of the bank as a going concern.

In reverse stress tests, the risk particularly to the regulatory KPIs is simulated with scenarios in which it would no longer be feasible to **continue the business model** or in which the business model would prove to be no longer sustainable. In the case of reverse stress tests, the priorities are therefore as follows: firstly, to identify relevant scenario approaches that could have the potential to jeopardize the bank's survival as a going concern, and secondly, to estimate the probability and plausibility of a specific, sufficiently serious scenario of this nature.

The reverse stress tests are generally carried out annually. The results are noted by the **Board of Managing Directors** and by the DZ BANK **Supervisory Board's Risk Committee**.

Scenario analyses in the risk types

The quarterly report on stress tests in the DZ BANK Group is supplemented by a credit risk stress test in the normative internal perspective and by various scenario analyses in the risk types in the economic perspective. These analyses serve as a link between risk drivers and sensitivities, and between potential events and adverse scenarios. The scenario analyses also enhance the risk quantification for each risk type by including an alternative perspective.

In the scenario analyses, specific risk drivers, risk concentrations, or events are examined in detail for each type of risk by simulating economic losses and comparing them against the relevant risk limit.

Scenario analyses in the risk types are carried out quarterly. The results are submitted in the DZ BANK Group stress tests report and are noted by the **Board of Managing Directors** and by the DZ BANK **Supervisory Board's Risk Committee**.

Backtesting and stress tests

The central value-at-risk model is subject to **backtesting**, the purpose of which is to verify the predictive quality of the model. Changes in the value of portfolios on each trading day are usually compared against the value-at-risk calculated using risk modeling.

Risks arising from extreme market situations are primarily recorded using **stress tests**. The crisis scenarios underlying the stress tests include the simulation of significant fluctuations in risk factors and serve to highlight potential losses not generally recognized in the value-at-risk approach. Stress tests are based on extreme market fluctuations that have actually occurred in the past together with crisis scenarios that – regardless of market data history – are considered to be economically relevant. The crisis scenarios used in this case are regularly reviewed to ensure they are appropriate. The following are deemed to be risk factors: interest-rate risk, spread risk, migration risk, equity risk, currency risk, and commodity risk.

2.2 Adequacy declarations to be made by the Board of Managing Directors

(Article 435 (1) letter e CRR)

The Board of Managing Directors of DZ BANK considers that the risk management system in place is adequate with regard to the risk profile and risk strategy of the DZ BANK Group. DZ BANK continuously develops the risk management system and ensures that any identified need for improvement is addressed systematically without delay.

2.3 Risk statement to be made by the Board of Managing Directors

(Article 435 (1) letter f CRR)

The requirements regarding a concise risk statement approved by the management body pursuant to article 435 (1) letter f CRR are met by means of the information provided in the 2022 regulatory risk report and the approval of this report by the Board of Managing Directors.

Furthermore, no material intragroup transactions were carried out in the DZ BANK Group in 2022.

2.4 Corporate governance arrangements

(Article 435 (2) CRR)

(Table EU OVB – Disclosure on governance arrangements)

2.4.1 Number of executive or supervisory directorships held by members of the management body

(Article 435 (2) letter a CRR)

Fig. 2 to Fig. 4 provide an overview of the number of executive or supervisory directorships held by members of the Board of Managing Directors and Supervisory Board, counted in accordance with article 91 (3) and (4) CRD IV.

Fig. 2 – Number of executive or supervisory directorships held by members of the Board of Managing Directors[1]

	Number of executive directorships		**Number of supervisory directorships**	
	Dec. 31, 2022	Dec. 31, 2021	**Dec. 31, 2022**	Dec. 31, 2021
Uwe Fröhlich Co-Chief Executive Officer	1	1	1	1
Dr. Cornelius Riese Co-Chief Executive Officer	1	1	1	1
Souâd Benkredda (since September 1, 2022)	1			
Uwe Berghaus	1	1		2
Dr. Christian Brauckmann	1	1		2
Ulrike Brouzi	1	1		2
Wolfgang Köhler (until December 31, 2022)	1	1		2
Michael Speth	1	1		2
Thomas Ullrich	1	1		2

1. Disclosure of directorships pursuant to article 91 (3) to (5) of Directive 2013/36/EU.

Fig. 3 – Number of executive or supervisory directorships held by members of the Board of Managing Directors[1]

	Number of executive directorships	**Number of supervisory directorships**
	2023	
Uwe Fröhlich Co-Chief Executive Officer	1	1
Dr. Cornelius Riese Co-Chief Executive Officer	1	1
Souâd Benkredda	1	2
Uwe Berghaus	1	2
Dr. Christian Brauckmann	1	2
Ulrike Brouzi	1	2
Michael Speth	1	2
Thomas Ullrich	1	2

1. Disclosure of directorships pursuant to article 91 (3) to (5) of Directive 2013/36/EU.

Fig. 4 – Number of executive or supervisory directorships held by members of the Supervisory Board[1]

	Number of executive directorships		Number of supervisory directorships	
	Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2022	Dec. 31, 2021
Henning Deneke-Jöhrens[2]	1	1	1	1
Ulrich Birkenstock[3]	-	-	1	1
Ingo Stockhausen[3]	1	1	1	1
Uwe Barth	1	1	2	2
Heiner Beckmann	-	-	1	1
Pia Erning[4]	-	-	1	-
Timm Häberle	1	1	1	1
Dr. Peter Hanker	1	1	1	1
Andrea Hartmann	-	-	1	1
Pilar Herrero Lerma	-	-	1	1
Dr. Dierk Hirschel	-	-	2	1
Josef Hodrus	1	1	2	2
Marija Kolak	-	-	3	3
Sascha Monschauer	1	1	1	1
Wolfgang Nett	-	-	1	1
Rolf Dieter Pogacar	-	-	1	1
Stephan Schack	1	1	1	1
Uwe Spitzbarth	-	-	1	2
Sigrid Stenzel	-	-	2	2
Dr. Gerhard Walther	1	1	2	2

1. As a significant institution, DZ BANK calculated the number of executive or supervisory directorships held by members of the Supervisory Board in 2021 and 2022 in accordance with the explanations on table EU OVB, row a in annex IV of Implementing Regulation (EU) 2021/637 in conjunction with article 91 (3) and (4) of Directive 2013/36/EU.
2. Chairman of the Supervisory Board.
3. Deputy Chairman.
4. Member of the Supervisory Board since May 25, 2022.

2.4.2 Recruitment policy for the selection of members of the management body and their actual knowledge, skills and expertise

(Article 435 (2) letter b CRR)

2.4.2.1 Supervisory Board

(Article 435 (2) letter b CRR)

The Articles of Association of DZ BANK state that the Supervisory Board consists of 20 members, nine of whom are elected by the Annual General Meeting and ten of whom are elected by employees pursuant to the provisions of the 1976 German Codetermination Act (MitbestG). The Bundesverband der Deutschen Volksbanken und Raiffeisenbanken e.V., Berlin, (BVR) [National Association of German Cooperative Banks], has the right to delegate one member of its Board of Managing Directors to the Supervisory Board. Only members of the managing body of a cooperative enterprise that is a shareholder of DZ BANK may be elected as shareholder representatives on the Supervisory Board.

The term of appointment of a Supervisory Board member is terminated prematurely

a. at the end of the next ordinary Annual General Meeting if the member no longer meets the above requirements, or
b. at the end of the ordinary Annual General Meeting in the calendar year in which the member reaches the age of 67.

In accordance with section 25d (11) sentence 2 no. 1 KWG, the Supervisory Board has adopted a process for preparing nominations for the election of members of the DZ BANK Supervisory Board that includes job descriptions and candidate profiles. This process is regularly put into practice when new Supervisory Board members are nominated.

In accordance with section 25d (11) sentence 2 nos. 3 and 4 KWG, a process has also been implemented by the Supervisory Board for regularly evaluating the Supervisory Board and its members. The self-evaluation conducted by the Supervisory Board in February 2022 found that the structure, size, composition, and performance of the Supervisory Board and the knowledge, skills, and experience of the individual Supervisory Board members and the Supervisory Board as a whole fulfilled the requirements laid down by law and in the Articles of Association. The Supervisory Board therefore confirmed the individual suitability of the individual members of the Supervisory Board and the collective suitability of the Supervisory Board as a whole. The Supervisory Board also signed off the profile of skills and expertise for the Supervisory Board.

DZ BANK also offers training opportunities to the members of the Supervisory Board, regardless of the period of time that they have been board members. This includes running inhouse training courses and covering the cost of supervisory board-related training programs offered by external providers.

Mr. Uwe Spitzbarth stepped down from the Supervisory Board with effect from January 1, 2023. Mr. Kevin Voß was appointed as his successor by the courts with effect from the same date.

2.4.2.2 Board of Managing Directors

(Article 435 (2) letter b CRR)

The Articles of Association of DZ BANK state that the Board of Managing Directors consists of at least three members. The number of members is determined by the Supervisory Board, which also appoints and removes members. The Supervisory Board can appoint up to two Chief Executive Officers and one Deputy Chief Executive Officer. As at the reporting date, the Board of Managing Directors of DZ BANK consisted of eight full members of the Board of Managing Directors including two Chief Executive Officers. Detailed career histories of the members of the Board of Managing Directors are presented on the DZ BANK website.

Only persons who have the professional qualifications specified in section 25c KWG and comply with other regulatory and stock corporation law requirements can be appointed to the Board of Managing Directors. In accordance with the rules of procedure for the Supervisory Board, the Nominations Committee assists the Supervisory Board in determining suitable candidates for appointment to the Board of Managing Directors. For this purpose, the Supervisory Board has approved principles for the selection and appointment of managing directors, including job descriptions and candidate profiles as required by section 25d (11) sentence 2 nos. 1 and 2 KWG. When selecting suitable candidates, the Nominations Committee takes into account the balance and diversity of the knowledge, skills, and experience of all the members of the Board of Managing Directors.

In accordance with section 25d (11) sentence 2 nos. 3 and 4 KWG, a process has also been implemented for regularly evaluating the Board of Managing Directors as a whole. The evaluation conducted by the Supervisory Board in February 2023 found that the structure, size, composition, and performance of the Board of Managing Directors, and the knowledge, skills, and experience of the individual members and the Board of Managing Directors as a whole fulfilled the requirements laid down by law and in the Articles of Association. The Supervisory Board therefore confirmed the individual suitability of the individual members of the Board of Managing Directors and the collective suitability of the Board of Managing Directors as a whole.

DZ BANK also offers various training courses to the members of the Board of Managing Directors, regardless of the period of time that they have been board members. For example, they can participate in training courses, conferences, and interactive formats through DZ BANK's Corporate Campus. The Corporate Campus is a platform for senior management in the DZ BANK Group that focuses on leadership, networking, and professional development with the objective of reinforcing the sustainability of the DZ BANK Group and the Volksbanken Raiffeisenbanken cooperative financial network.

2.4.3 Diversity policy for selecting members of the management body, objectives and targets of the policy, and achievement
(Article 435 (2) letter c CRR)

2.4.3.1 Supervisory Board
(Article 435 (2) letter c CRR)

In accordance with section 25d (11) sentence 2 no. 2 KWG, the Supervisory Board has adopted a strategy aimed at promoting the nomination of women, who are currently under-represented on the DZ BANK Supervisory Board. In a resolution passed on November 29, 2018, the Supervisory Board modified this strategy, integrated it into the new diversity policy, and reset the target. Under this strategy, the Supervisory Board's objective was, by 2023, to at least stabilize the proportion of female members (who are currently under-represented) at the current level (on the date of the adopted resolution / equates to the level as at December 31, 2022: five members or 25 percent). This target was met throughout 2022. In the context of the most recent update of the diversity policy (February 23, 2023), this target was reaffirmed for the period up to 2027.

2.4.3.2 Board of Managing Directors
(Article 435 (2) letter c CRR)

In a resolution passed on November 29, 2018, the Supervisory Board set a target of 12.5 percent for the proportion of women (who are currently under-represented) on the Board of Managing Directors of DZ BANK for the period up to October 31, 2023. This target was met throughout 2022. The appointment of Ms. Benkredda to succeed Mr. Köhler increased the proportion of women to 25 percent. In the context of the most recent update of the diversity policy (February 23, 2023), the target was therefore set at 25 percent for the period up to 2027.

2.5 Disclosures regarding the formation of a risk committee and the number of times it has met
(Article 435 (2) letter d CRR)

The DZ BANK banking group has formed a separate Risk Committee, which met five times in 2022.

2.6 Information flow to the Board of Managing Directors and Supervisory Board
(Article 435 (2) letter e CRR)

Governance in the DZ BANK Group is characterized by the general management approach of the DZ BANK Group, appointments to key posts in the subsidiaries, and the committee structure.

The general management approach consists of a combination of centralized and decentralized management tools. It is aligned with the business model and risks of the DZ BANK Group as a diversified financial services group that is integrated into the Volksbanken Raiffeisenbanken cooperative financial network and that provides this network with a comprehensive range of financial products.

For the purposes of managing the subsidiaries through appointments to key posts, a representative of DZ BANK is appointed in each case as the chairman of the supervisory body and generally also as the chairman of any associated committees (risk and investment committee, audit committee, human resources committee).

In cooperation with the other management units, the Group Risk Management & Services and Group Risk Controlling divisions at DZ BANK create a groupwide risk reporting system covering all material types of risk based on specified minimum standards using methods agreed between the management units.

Risk reporting

The quarterly overall risk report includes the risks throughout the group identified by DZ BANK. Together with the DZ BANK Group stress tests report, which is also compiled on a quarterly basis, the overall risk report is the main channel through which risks incurred by the DZ BANK Group and the management units are communicated to the Supervisory Board's Risk Committee, the Board of Managing Directors, and the Group Risk and Finance Committee. Economic and regulatory key risk indicators are also made available to the Board of Managing Directors in a monthly overall risk report, which is intended to ensure that the Board is informed promptly about the overall risk situation. In addition, the Board of Managing Directors and the Supervisory Board's Risk Committee receive portfolio and exposure-related management information in the quarterly credit risk report for the DZ BANK Group. The Board of Managing Directors also receives monthly information on liquidity risk in the DZ BANK Group and in the management units.

To complement the above, the management units have further reporting systems for all relevant types of risk. Depending on the degree of materiality in the risk exposures concerned, these systems aim to ensure that decision-makers and supervisory bodies receive transparent information at each measurement date on the risk profile of the management units for which they are responsible.

Supervisory Board

The Board of Managing Directors reports to the Supervisory Board of DZ BANK four times a year about the risk situation, the risk strategies, and the status and further development of the risk management system of the DZ BANK Group and DZ BANK. The Board of Managing Directors also provides the Supervisory Board with reports about significant loan and investment exposures and the associated risks, again four times a year. The Supervisory Board discusses these issues with the Board of Managing Directors, advises it, and monitors its management activities. The Supervisory Board is involved in decisions of fundamental importance.

The Supervisory Board has set up a Risk Committee, which addresses issues related to overall risk appetite and risk strategy. The chairman of the Risk Committee reports to the full Supervisory Board four times a year on the material findings of the committee's work.

At least quarterly, the Board of Managing Directors makes the centrally produced risk reports available to the members of the Risk Committee and the other members of the Supervisory Board. The chairman of the Risk Committee informs the full Supervisory Board about the main content of these reports no later than at its next meeting. In addition, the Audit Committee regularly examines the effectiveness of the internal control system, risk management system, and internal audit. It passes on important information to the other Supervisory Board members in the Audit Committee Chairman's reports at Supervisory Board meetings and by distributing the minutes from Audit Committee meetings to the other Supervisory Board members.

Further information on risk-related communications and risk reporting for the individual risk types can be found in sections 2.1.2.1 (equity investment risk), 6.1.2 (credit risk), 8.2.3 (market risk), 9.4 (operational risk), 10.4 (business risk), and 11.2.5 (liquidity risk) of this report.

3 Scope of application

(Article 436 CRR)

3.1 Definitions and determination of materiality

(Article 436 in conjunction with article 432 CRR)

In the reporting, a disclosure is material if its omission or misstatement could change or influence the assessment or decision of a user who is relying on this disclosure to make economic decisions (use test).

The use test for regulatory risk reporting is enshrined in article 432 CRR, which sets out the information that does not have to be disclosed if it is not regarded as material pursuant to article 432 (1) CRR. However, this explicitly does not apply to the disclosures required pursuant to article 435 (2) letter c (diversity policy for members of the management body), article 437 (own funds), and article 450 (remuneration policy) CRR and the disclosures required pursuant to Part 8 Title III CRR that are not at the discretion of the individual institution. The disclosures in this risk report relate to all entities that are consolidated for regulatory purposes pursuant to article 432 (1) CRR. All entities consolidated for regulatory purposes are included in these disclosures to ensure that the key regulatory figures are consistent with the figures reported.

The terms DZ BANK Group and DZ BANK financial conglomerate are synonymous and refer to all the management units together. The context dictates the choice of term. For example, in the case of disclosures relating to economic management, the focus is on the DZ BANK Group, whereas in the case of regulatory issues relating to all the management units in the DZ BANK Group, the appropriate term is DZ BANK financial conglomerate.

The DZ BANK financial conglomerate largely comprises the DZ BANK banking group and the R+V Versicherung AG insurance group. DZ BANK acts as the financial conglomerate’s parent company.

As part of the DZ BANK financial conglomerate, the DZ BANK banking group and the R+V Versicherung AG insurance group are subject to the provisions of the German Supervision of Financial Conglomerates Act (FKAG). In conjunction with article 49 (1) CRR on the requirements for waiving capital deductions for long-term equity investments in insurance companies and the regulatory technical standards for the application of the calculation methods of capital adequacy requirements for financial conglomerates (Delegated Regulation (EU) No. 342/2014 dated January 21, 2014) published in April 2014, FKAG governs the capital adequacy requirements for the DZ BANK financial conglomerate. The additional regulation of financial conglomerates applies to groups of financial institutions that operate to a large degree across both the banking and the insurance sectors and includes requirements for capital adequacy, for recording and monitoring material risk concentrations and transactions within the conglomerate, and for cross-sectoral risk management. In this regard, it has to meet the relevant requirements with respect to **financial conglomerates’ solvency** and the establishment of an overarching risk management structure.

All subsidiaries in the financial conglomerate are integrated into the DZ BANK Group’s centralized risk management system. All subsidiaries that are consolidated for regulatory purposes are included in this report, subject to the principle of materiality pursuant to article 432 (1) CRR. Materiality is determined on the basis of the materiality concept that is used in the commercial-law risk report. The risk types and risk capital requirements that are measured in the DZ BANK Group, combined with the limits set for these by the individual management units, are used to determine materiality.

3.2 Differences between the scope of consolidation for accounting purposes and the scope of consolidation for regulatory purposes

Table EU LIA – Explanations of differences between accounting and regulatory exposure amounts
(Article 436 sentence 1 letter b CRR)
Table EU LIB – Other qualitative information on the scope of application
(Article 436 sentence 1 letters f, g, and h CRR)

The entities in which DZ BANK has a direct or indirect long-term equity investment are aggregated and consolidated both for accounting purposes and in order to satisfy regulatory requirements. The commercial-law provisions to be applied for consolidation in accordance with IFRS differ in some regards from the provisions applicable to consolidation for regulatory purposes, in terms of both the consolidation methods used and the entities to be included. The consolidation matrix below (Fig. 5) shows the entities that are significant for internal risk management purposes and the companies that are consolidated for regulatory purposes. It is limited to the consolidated subgroup parent companies and other entities. As required by Implementing Regulation (EU) 2021/637, the description in column f of the matrix classifies the entities according to the nature of their business and based on the definitions in article 4 CRR. The entities are also categorized according to the nature of their treatment for regulatory purposes (columns b to e) and the nature of their consolidation for commercial-law purposes (column a).

FIG. 5 – EU LI3 – OUTLINE OF THE DIFFERENCES IN THE SCOPES OF CONSOLIDATION (ENTITY BY ENTITY)
(Article 436 sentence 1 letter b CRR)

a	b	c	d	e	f	g	h
Name of the entity	**Method of accounting consolidation**	**Method of regulatory consolidation**					**Description of the entity**
		Full consolidation	**Proportional consolidation**	**Equity method**	**Neither consolidated nor deducted**	**Deducted**	
DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main, (DZ BANK)	Full consolidation	●					Credit institution
Bausparkasse Schwäbisch Hall AG, Schwäbisch Hall, (BSH)	Full consolidation	●					Credit institution
Beteiligungsgesellschaft Westend 1 mbH & Co. KG, Frankfurt am Main	Full consolidation	●					Management of long-term equity investments
Deutsche WertpapierService Bank AG, Frankfurt am Main, (dwpbank)	Equity method		●				Credit institution
DVB Transport Finance Limited	Full consolidation	●					Other financial services
DZ Beteiligungs-gesellschaft mbH Nr. 18, Frankfurt am Main	Full consolidation	●					Management of long-term equity investments
DZ HYP AG, Hamburg/ Münster, (DZ HYP)	Full consolidation	●					Credit institution
DZ PRIVATBANK (Schweiz) AG, Zurich, Switzerland	Full consolidation	●					Credit institution

a	b	c	d	e	f	g	h
Name of the entity	Method of accounting consolidation	Method of regulatory consolidation					Description of the entity
		Full consolidation	Proportional consolidation	Equity method	Neither consolidated nor deducted	Deducted	
DZ PRIVATBANK S.A., Strassen, Luxembourg (DZ PRIVATBANK)	Full consolidation	●					Credit institution
GAF Active Life 1 Renditebeteiligungs- GmbH & Co. KG, Nidderau	Not consolidated	●					Other financial services
GAF Active Life 2 Rendite-beteiligungs- GmbH & Co. KG, Nidderau	Not consolidated	●					Other financial services
Immobilien-Gesellschaft 'DG Bank-Turm, Frankfurt am Main, Westend' mbH & Co. KG des genossenschaftlichen Verbundes	Full consolidation	●					Management of land and buildings
IMPETUS Bietergesellschaft mbH, Düsseldorf	Full consolidation	●					Management of long-term equity investments
IPConcept (Luxemburg) S.A., Strassen, Luxembourg	Full consolidation	●					Other financial services
IPConcept (Schweiz) AG, Zurich, Switzerland	Full consolidation	●					Other financial services
KBIH Beteiligungs-gesellschaft für Industrie und Handel mbH, Frankfurt am Main	Full consolidation	●					Management of long-term equity investments
Phoenix Beteiligungs-gesellschaft mbH, Düsseldorf	Full consolidation	●					Management of long-term equity investments
R+V Versicherung AG insurance group, Wiesbaden, (R+V)	Full consolidation			●			Insurance company
ReiseBank Aktien-gesellschaft, Frankfurt am Main	Full consolidation	●					Credit institution
TeamBank AG Nürnberg, Nuremberg, (TeamBank)	Full consolidation	●					Credit institution
Union Asset Management Holding AG, Frankfurt am Main, (UMH)	Full consolidation	●					Financial services
VR Equitypartner GmbH, Frankfurt am Main	Full consolidation	●					Management of long-term equity investments
VR Factoring GmbH, Eschborn	Full consolidation	●					Financial services
VR GbR, Frankfurt am Main	Full consolidation	●					Management of long-term equity investments
VR Payment GmbH, Frankfurt am Main	Full consolidation	●					Other activities linked to financial services
VR Smart Finanz AG, Eschborn (VR Smart Finanz)	Full consolidation	●					Financial services

The significant entities are consolidated for both regulatory and commercial-law purposes. However, insurance companies and companies not in the financial sector are not required to be consolidated in the banking group for regulatory purposes. In this context, R+V is fully consolidated for commercial-law purposes but is not directly subject to banking regulation. Consequently, it is factored into the procedure used to determine the DZ BANK banking group's capital requirements and disclosures using the risk-weighted carrying amount of DZ BANK's investment in R+V. Furthermore, R+V is included in the cross-sectoral surveillance by the banking supervisory authority of the DZ BANK financial conglomerate at consolidated level (based on the consolidation of the entire R+V Versicherung AG insurance group) in the legal framework applicable to financial conglomerates.

In both cases, the scope of consolidation includes a large number of other entities that are not shown because they are less material.

The regulatory liquidity ratios, the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR), are calculated for the DZ BANK banking group at consolidated level in accordance with article 11 (4) CRR. The companies consolidated for regulatory purposes, on the basis of which the LCR and NSFR requirements are calculated and complied with, are determined in accordance with article 18 CRR and differ from the scope of consolidation that has to be used to determine regulatory own funds. The difference is that the requirements of article 18 (3) to (6) and (9) CRR are not used to determine the consolidated liquidity position pursuant to article 11 (4) CRR. Accordingly, voluntarily consolidated entities, entities that are proportionally consolidated, and entities that are not subsidiaries are not taken into account for the purpose of calculating and complying with the requirements in Part 6 CRR (liquidity purposes) at consolidated level. In addition, requests to waive consolidation of certain subsidiaries for the purposes of meeting liquidity requirements pursuant to article 19 (2) CRR were granted by BaFin in 2014 and the ECB in 2016. This means that the regulators have agreed that individual subsidiaries that can be disregarded in the banking regulators' liquidity risk targets for the DZ BANK banking group do not have to be consolidated for liquidity purposes. This ruling applies specifically to entities that are almost entirely funded by equity or are funded to a large degree from within the group. Ancillary services undertakings and asset management companies have been consolidated for liquidity purposes since December 28, 2020 due to application of the consolidation rules in CRR II.

Including the parent company DZ BANK and the other entities listed in Fig. 5, a total of 55 companies were **consolidated for regulatory purposes** as at December 31, 2022 (December 31, 2021: 60).

Of this total, 49 companies were fully consolidated (December 31, 2021: 53) and can be broken down into the following types:

- 8 banks (December 31, 2021: 10)
- 1 financial institution in the other credit institutions category pursuant to KWG (December 31, 2021: 2)
- 9 financial institutions that are asset management companies (December 31, 2021: 9)
- 14 financial institutions considered to be finance companies under KWG (December 31, 2021: 16)
- 2 financial institutions categorized as other financial institutions (December 31, 2021: 2)
- 5 investment firms (December 31, 2021: 5)
- 1 payment institution (December 31, 2021: 2)
- 9 ancillary services undertakings (December 31, 2021: 7)

Furthermore, 2 ancillary services undertakings were consolidated on a voluntary basis as at the reporting date (December 31, 2021: 2). The other financial institution that had been consolidated on a voluntary basis as at December 31, 2021 no longer existed as at the reporting date. In addition, 3 banks (December 31, 2021: 3) and 1 asset management company (December 31, 2021: 1) were proportionally consolidated.

DZ BANK is either directly or indirectly the major shareholder in the long-term equity investments consolidated for regulatory purposes. Most of the companies are based either in Germany or elsewhere in the European Union. On the reporting date, there were no **impediments to the prompt transfer of own funds or repayment of liabilities** between DZ BANK and material subsidiaries within the meaning of article 436 letter c CRR.

The **capital waiver**, according to which – provided certain conditions are met – the regulatory supervision of individual Germany-based institutions within a banking group may be replaced by supervision of the entire banking group, is used in the DZ BANK banking group for DZ HYP (group waiver pursuant to article 7 (1) CRR).

Deutsche Genossenschafts-Hypothekenbank AG, Hamburg (DG HYP), which was the predecessor institution of DZ HYP, reported this to the banking supervisory authority in November 2012 together with evidence that the application criteria had been met. In the context of the merger of the former WL BANK with DG HYP, the ECB was notified that the capital waiver would continue to be used for DZ HYP. The prerequisites for this waiver continue to be met following this merger. The **capital waiver** can only be used if the subordinate entity is closely integrated into the group structure. This is particularly assumed to be the case if the parent company is able to exercise control over the subordinated entity because it holds the majority of its voting rights and it has issued an unrestricted letter of comfort in relation to the subordinated entity. Furthermore, the regulatory management of the subordinated institution by the parent company must meet ECB requirements. The entity that is the subject of the waiver must be included in the strategy, risk-bearing capacity, and risk management processes of the parent institution. The parent company must also be able to issue direct instructions within the group in order to ensure the integration of the subordinated entity. DZ HYP is fully integrated into the internal processes and risk management of DZ BANK as the parent company of the banking group. In addition to legal, organizational, and structural integration, this particularly applies to the structure of its decision-making bodies, ICAAP, the strategic planning process, business and risk strategies, and the reporting and disclosure system. There are no current or foreseeable legal or actual material impediments to the immediate transfer of own funds to DZ HYP or to the repayment of liabilities to DZ HYP by DZ BANK.

Since December 31, 2021, the DZ BANK banking group has been permitted by the ECB to apply a liquidity waiver pursuant to article 8 CRR. This waiver exempts DZ BANK and DZ HYP from fulfilling the requirements for the liquidity ratios (LCR and NSFR) at individual institution level. Instead, the requirements for the liquidity ratios are to be applied at the level of a single liquidity subgroup consisting of these two institutions.

3.3 Differences in the basis of consolidation for accounting and regulatory purposes

(Article 436 sentence 1 letter c CRR)

Fig. 6 compares the carrying amounts – as published in the DZ BANK Group's consolidated financial statements on the basis of the scope of consolidation for accounting purposes (column a) – with the carrying amounts resulting from application of the scope of consolidation for regulatory purposes (column b). Furthermore, the amounts stated in the consolidated financial statements and applied to the scope of consolidation for regulatory purposes are broken down by the risk categories described in Part 3 Title II CRR (columns c to g). The breakdown for columns c to f in Fig. 6 below thus follows the frameworks for

– credit risk (column c);
– counterparty credit risk (column d);
– securitizations (column e); and
– market risk (column f).

Column g shows amounts that are subject to direct deduction or are not subject to capital requirements. Please note that the amounts in columns c to g do not necessarily match the carrying amounts disclosed in column b. This is due to the fact that, in the context of capital requirements, individual asset and liability items on the balance sheet are subject to more than one of the risk types described in Fig. 8. For reasons of consistency, securities financing transactions are assigned to the credit risk category. Consequently, securities classed as investments subject to sale and repurchase agreements are recognized twice in the credit risk category because not only the credit risk but also an existing counterparty risk is recognized for the underlying securities.

In accordance with Implementing Regulation (EU) 2021/637, equity was required to be shown in Fig. 6 for the first time as at December 31, 2021. For the reconciliation of the equity reported on the balance sheet with the regulatory own funds of the DZ BANK banking group, please see Fig. 13.

FIG. 6 – EU LI1 – DIFFERENCES BETWEEN ACCOUNTING AND REGULATORY SCOPES OF CONSOLIDATION AND MAPPING OF FINANCIAL STATEMENT CATEGORIES WITH REGULATORY RISK CATEGORIES AS AT DECEMBER 31, 2022
(Article 436 sentence 1 letter c CRR)

		a	b	c	d	e	f	g
					Carrying amounts of items			
€ million		**Carrying amounts as reported in published financial statements**	**Carrying amounts under scope of regulatory consoli-dation**	**Subject to the credit risk framework**	**Subject to the CCR framewor k**	**Subject to the securiti-zation framework**	**Subject to the market risk framework**	**Not subject to capital require-ments or subject to deduction from own funds**
	Breakdown by asset class according to the balance sheet in the published financial statements							
1	Cash and cash equivalents	93,717	93,862	93,862	-	-	-	-
2	Loans and advances to banks	123,444	123,173	123,050	-	-	123	0
3	Loans and advances to customers	203,646	205,647	200,660	-	2,811	2,176	0
4	Hedging instruments (positive fair values)	1,568	1,568	-214	1,490	-	276	16
5	Financial assets held for trading	48,909	49,369	27,788	21,3	213	-	0
6	Investments	43,393	48,261	37,745	-	1,755	9,416	-655
7	Investments held by insurance companies	105,955	-	-	-	-	-	-
8	Property, plant and equipment, investment property, and right-of-use assets	1,960	1,980	1,954	-	-	26	0
9	Income tax assets	3,428	1,536	461	-	-	8	1,067
10	Other assets	7,204	3,189	2,555	-	-	101	533
11	Loss allowances	-2,029	-2,072	-2,030	-	-	-42	0
12	Non-current assets and disposal groups classified as held for sale	19	19	-	-	-	-	19
13	Fair value changes of the hedged items in portfolio hedges of interest-rate risk	-4,173	-4,173	-1,076	1	-	-3,099	-
14	**Total assets**	**627,041**	**522,359**	**484,756**	**22,8**	**4,778**	**8,985**	**980**
	Breakdown by liability class according to the balance sheet in the published financial statements							
1	Deposits from banks	186,787	186,995	0	-	-	17	186,977
2	Deposits from customers	159,429	165,999	-	-	-	2,952	163,048
3	Debt certificates issued including bonds	82,349	82,580	-	-	-	299	82,281
4	Hedging instruments (negative fair values)	442	442	-5	10	-	8	429
5	Financial liabilities held for trading	52,478	52,498	3,029	15,2 72	33	86	34,077
6	Provisions	3,248	3,341	11	-	-	146	3,184
7	Insurance liabilities	103,795	-	-	-	-	-	-
8	Income tax liabilities	1,063	581	-	-	-	4	577
9	Other liabilities	10,999	3,482	-	-	-	82	3,400
10	Subordinated capital	4,521	4,530	-	-	-	231	4,299
11	Liabilities included in disposal groups classified as held for sale	-	-	-	-	-	-	-
12	Fair value changes of the hedged items in portfolio hedges of interest-rate risk	-1,147	-1,147	-	-	-	-	-1,147
13	Equity	23,076	23,058	-	-	-	-	23,058
14	**Total equity and liabilities**	**627,041**	**522,359**	**3,036**	**15,2[illegible]**	**33**	**3,825**	**500,183**

The difference of €104,682 million between the total assets in columns a and b is mainly the result of the deconsolidation of R+V (€116,900 million) and the recognition of this entity in the scope of consolidation for regulatory purposes at its carrying amount of €3,180 million calculated using the equity method. There are also differences totaling €3,064 million in the scopes of consolidation of the subgroups, mainly BSH. The discrepancies between the scopes of consolidation also give rise to differences of €5,974 million in the consolidation of intragroup transactions.

FIG. 7 – EU LI1 – DIFFERENCES BETWEEN ACCOUNTING AND REGULATORY SCOPES OF CONSOLIDATION AND MAPPING OF FINANCIAL STATEMENT CATEGORIES WITH REGULATORY RISK CATEGORIES AS AT DECEMBER 31, 2021
(Article 436 sentence 1 letter c CRR)

		a	b	c	d	e	f	g
					Carrying amounts of items			
	€ million	Carrying amounts as reported in published financial statements	Carrying amounts under scope of regulatory consolidation	Subject to the credit risk framework	Subject to the CCR framework	Subject to the securitization framework	Subject to the market risk framework	Not subject to capital requirements or subject to deduction from own funds
	Breakdown by asset class according to the balance sheet in the published financial statements							
1	Cash and cash equivalents	86,029	86,218	85,972	-	-	349	-
2	Loans and advances to banks	107,659	107,389	107,389	-	-	172	-
3	Loans and advances to customers	195,665	197,589	195,212	-	1,755	3,574	-
4	Hedging instruments (positive fair values)	389	389	-23	393	-	64	-
5	Financial assets held for trading	47,321	46,722	30,192	16,231	318	11	-
6	Investments	52,440	60,503	45,410	-	1,774	13,195	2
7	Investments held by insurance companies	129,131	-	-405	-	-	405	-
8	Property, plant and equipment, investment property, and right-of-use assets	1,881	1,904	1,610	-	-	33	-
9	Income tax assets	1,141	771	17	-	-	8	474
10	Other assets	6,490	2,449	1,705	-	-	100	676
11	Loss allowances	-1,956	-1,998	-1,960	-	-	-194	0
12	Non-current assets and disposal groups classified as held for sale	164	156	131	-	-	131	-
13	Fair value changes of the hedged items in portfolio hedges of interest-rate risk	920	920	920	-	-	-	-
14	**Total assets**	**627,273**	**503,011**	**466,171**	**16,623**	**3,847**	**17,848**	**1,153**
	Breakdown by liability class according to the balance sheet in the published financial statements							
1	Deposits from banks	196,562	196,658	0	-	-	17	196,641
2	Deposits from customers	138,975	143,070	-	-	-	2,952	140,118
3	Debt certificates issued including bonds	79,652	79,885	-	-	-	299	79,586
4	Hedging instruments (negative fair values)	1,678	1,678	-5	10	-	8	1,665
5	Financial liabilities held for trading	43,411	43,428	3,029	15,272	33	86	25,008
6	Provisions	3,992	4,026	11	-	-	146	3,868
7	Insurance liabilities	118,863	-	-	-	-	-	-
8	Income tax liabilities	1,456	552	-	-	-	4	548

		a	b	c	d	e	f	g
		Carrying amounts as reported in published financial statements	Carrying amounts under scope of regulatory consoli-dation	Carrying amounts of items				
	€ million			Subject to the credit risk framework	Subject to the CCR framework	Subject to the securiti-zation framework	Subject to the market risk framework	Not subject to capital require-ments or subject to deduction from own funds
9	Other liabilities	10,797	3,161	-	-	-	82	3,079
10	Subordinated capital	3,074	3,085	-	-	-	231	2,854
11	Liabilities included in disposal groups classified as held for sale	2	2	-	-	-	2	0
12	Fair value changes of the hedged items in portfolio hedges of interest-rate risk	150	150	-	-	-	-	150
13	Equity	28,661	27,316	-	-	-	-	27,316
14	**Total equity and liabilities**	**627,273**	**503,011**	**3,036**	**15,282**	**33**	**3,826**	**480,834**

3.4 Differences between the carrying amounts in the consolidated financial statements and the exposures recognized for regulatory purposes

(Article 436 sentence 1 letter d CRR)

Fig. 8 shows the differences between the carrying amounts in the consolidated financial statements and the exposures used for regulatory purposes, unless already included in Fig. 6. To provide a comparison, Fig. 9 shows the disclosures as at December 31, 2021.

FIG. 8 – EU LI2 – MAIN SOURCES OF DIFFERENCES BETWEEN REGULATORY EXPOSURE AMOUNTS AND CARRYING AMOUNTS IN FINANCIAL STATEMENTS AS AT DECEMBER 31, 2022

		a	b	c	d	e
			Items subject to			
(Article 436 sentence 1 letter d CRR)**€ million**		**Total**	**Credit risk framework**	**Securitization framework**	**CCR framework**	**Market risk framework**
1	Carrying amount of assets under the scope of regulatory consolidation (as per template EU LI1)	521,379	484,756	22,860	4,778	8,985
2	Carrying amount of liabilities under the scope of regulatory consolidation (as per template EU LI1)	22,176	3,036	15,282	33	3,825
3	Total net amount under the regulatory scope of consolidation	499,203	481,721	7,577	4,745	5,160
4	Off-balance-sheet amounts	100,986	49,408	-	3,632	6
5	Differences in valuations	-1,823	-10,558	5,916	-	2,818
6	Differences due to different netting rules, other than those already included in row 2	-2,057	-2,150	94	-	-
7	Differences due to consideration of provisions	1,846	1,846	-	-	-
8	Differences due to the use of credit risk mitigation techniques	-	-	-	-	-
9	Differences due to credit conversion factors	-	47,940	-	-	-
10	Differences due to securitization with risk transfer	-	-	-	-	-
11	Other differences	-3,996	1,605	2,514	-131	-7,984
12	**Exposure amounts considered for regulatory purposes**	**594,159**	**569,811**	**16,101**	**8,246**	**-**

FIG. 9 – EU LI2 – MAIN SOURCES OF DIFFERENCES BETWEEN REGULATORY EXPOSURE AMOUNTS AND CARRYING AMOUNTS IN FINANCIAL STATEMENTS AS AT DECEMBER 31, 2021
(Article 436 sentence 1 letter d CRR)

		a	b	c	d	e
			Items subject to			
€ million		Total	Credit risk framework	Securitization framework	CCR framework	Market risk framework
1	Carrying amount of assets under the scope of regulatory consolidation (as per template EU LI1)	504,489	466,171	16,623	3,847	17,848
2	Carrying amount of liabilities under the scope of regulatory consolidation (as per template EU LI1)	22,177	3,036	15,282	33	3,826
3	Total net amount under the regulatory scope of consolidation	482,312	463,135	1,341	3,813	14,022
4	Off-balance-sheet amounts	96,235	39,534	-	3,651	4
5	Differences in valuations	-4,954	-12,559	8,916	-	-1,312
6	Differences due to different netting rules, other than those already included in row 2	1,178	-	94	-	1,084
7	Differences due to consideration of provisions	1,255	1,255	-	-	-
8	Differences due to the use of credit risk mitigation techniques	-	-	-	-	-
9	Differences due to credit conversion factors	-	53,046	-	-	-
10	Differences due to securitization with risk transfer	-	-	-	-	-
11	Other differences	-8,389	1,939	3,706	-237	-13,798
12	**Exposure amounts considered for regulatory purposes**	**567,636**	**546,351**	**14,057**	**7,228**	**-**

Rows 1 and 2 are attributable to the carrying amounts of the assets and liabilities under the regulatory scope of consolidation and are transferred from Fig. 6 to Fig. 8 without the exposures that are subject to direct deduction or are not subject to capital requirements (Fig. 6, column g).

Row 3 therefore shows the total net amount for these items under the regulatory scope of consolidation. In respect of the off-balance-sheet amounts (row 4), please note that the off-balance-sheet exposures in column a are recognized before application of the credit conversion factors (CCFs), whereas the CCFs have been applied in columns b to e. Consequently, an adjustment to the reconciliation is necessary in row 9 because the exposures recognized for regulatory purposes include off-balance-sheet exposures to which CCFs have not been applied.

Furthermore, row 5 shows the differences in valuation between the regulatory and accounting amounts. One example is the difference in the carrying amounts for derivative transactions.

Further differences between the regulatory and accounting amounts arise from the disclosure of differences due to different netting rules, other than those already included in row 2 (row 6). In the liquidation netting of derivatives, for example, a netting rule is used that differs from the simple calculation of the net amount in row 3.

Another difference affects the recognition of loan loss allowances and provisions in the IRB approach that are not part of the regulatory basis of assessment and are adjusted through row 7.

The other reconciliation items in row 11 include regulatory risk adjustments to exposures in internal models.

4 Key metrics

(Article 447 sentence 1 letters a to g and article 438 letter b CRR)

Fig. 10 summarizes the most important regulatory key metrics and their input variables. In addition to own funds, risk-weighted exposure amounts (RWEAs), capital ratios, additional requirements in connection with the Supervisory Review and Evaluation Process (SREP), and capital buffers, this figure contains disclosures relating to the leverage ratio, liquidity coverage ratio (LCR), and net stable funding ratio (NSFR).

FIG. 10 – EU KM1 – KEY METRICS
(Article 447 sentence 1 letters a to g and article 438 letter b CRR)

		a	b	c	d	e
€ million		Dec. 31, 2022	Sep. 30, 2022	Jun. 30, 2022	Mar. 31, 2022	Dec. 31, 2021
Available own funds (amounts)						
1	Common equity Tier 1 capital (CET1)	18,762	17,637	19,343	20,808	23,026
2	Tier 1 capital (T1)	20,912	19,793	21,504	22,969	25,188
3	Total capital	24,719	23,700	23,876	25,395	27,734
Risk-weighted exposure amounts						
4	Total risk exposure amount	137,379	146,348	145,208	147,489	150,137
Capital ratios (as a percentage of risk-weighted exposure amount)						
5	Common equity Tier 1 capital ratio (CET1 ratio) (%)	13.66	12.05	13.32	14.11	15.34
6	Tier 1 capital ratio (%)	15.22	13.52	14.81	15.57	16.78
7	Total capital ratio (%)	17.99	16.19	16.44	17.22	18.47
Additional capital requirements to address risks other than the risk of excessive leverage (as a percentage of risk-weighted exposure amount)						
EU 7a	Additional capital requirements to address risks other than the risk of excessive leverage (%)	1.70	1.70	1.70	1.70	1.75
EU 7b	Of which: to be made up of CET1 capital (percentage points)	0.96	0.96	0.96	0.96	0.98
EU 7c	Of which: to be made up of T1 capital (percentage points)	1.28	1.28	1.28	1.28	1.31
EU 7d	Total SREP capital requirement (%)	9.70	9.70	9.70	9.70	9.75
Combined buffer and overall capital requirement (as a percentage of risk-weighted exposure amount)						
8	Capital conservation buffer (%)	2.50	2.50	2.50	2.50	2.50
EU 8a	Capital conservation buffer due to macroprudential or systemic risk identified at the level of a member state (%)	-	-	-	-	-
9	Institution-specific countercyclical capital buffer (%)	0.05	0.03	0.02	0.02	0.02
EU 9a	Systemic risk buffer (%)	-	-	-	-	-
10	Global systemically important institution buffer (%)	-	-	-	-	-
EU 10a	Other systemically important institution buffer (%)	1.00	1.00	1.00	1.00	1.00
11	Combined capital buffer requirement (%)	3.55	3.53	3.52	3.52	3.52
EU 11a	Overall capital requirements (%)	13.25	13.23	13.22	13.22	13.27
12	CET1 capital available after meeting the total SREP capital requirement (%)	7.95	6.25	6.74	7.52	8.72
Leverage ratio						
13	Total exposure measure	440,948	488,957	479,718	355,871	345,571
14	Leverage ratio (%)	4.74	4.05	4.48	6.45	7.29
Additional capital requirements to address the risk of excessive leverage (as a percentage of total exposure measure)						
EU 14a	Additional capital requirements to address the risk of excessive leverage (%)	-	-	-	-	-
EU 14b	Of which: to be made up of CET1 capital (percentage points)	-	-	-	-	-
EU 14c	Total SREP leverage ratio requirements (%)	3.00	3.00	3.00	3.26	3.26
Leverage ratio buffer and overall leverage ratio requirement (as a percentage of total exposure measure)						
EU 14d	Leverage ratio buffer (%)	-	-	-	-	-
EU 14e	Total leverage ratio (%)	3.00	3.00	3.00	3.26	3.26
Liquidity coverage ratio						
15	Total high-quality liquid assets (HQLAs) (weighted value – average)	124,173	120,706	117,389	114,854	110,423
EU 16a	Cash outflows – total weighted value	105,709	103,030	97,437	92,942	87,968
EU 16b	Cash inflows – total weighted value	20,095	20,304	19,050	17,685	16,777
16	Total net cash outflows (adjusted value)	85,613	82,726	78,387	75,256	71,191

		a	b	c	d	e
€ million		Dec. 31, 2022	Sep. 30, 2022	Jun. 30, 2022	Mar. 31, 2022	Dec. 31, 2021
17	Liquidity coverage ratio (%)	145.25	146.14	150.24	153.08	155.19
Net stable funding ratio						
18	Total available stable funding	269,480	283,004	281,086	293,433	293,746
19	Total required stable funding	220,257	234,943	231,692	234,668	231,164
20	Net stable funding ratio (NSFR) (%)	122.35	120.46	121.32	125.04	127.07

The composition and changes compared with the previous reporting date for the key metrics listed in Fig. 10 in connection with the DZ BANK banking group's capital adequacy, liquidity adequacy, and leverage are explained in detail later in this report.

The minimum capital requirements that the DZ BANK banking group had to comply with in 2022 comprised those components of Pillar 1 laid down as mandatory by law and those individually specified by the banking supervisor. Institution-specific requirements under the additional capital requirements in Pillar 2, determined in the outcome of the Supervisory Review and Evaluation Process (SREP) conducted for the DZ BANK banking group in 2021, also had to be satisfied. In this process, the banking supervisor specified a mandatory add-on (Pillar 2 requirement) that, along with other components (see Fig. 10), is factored into the basis of calculation used to determine the threshold for the maximum distributable amount (MDA). Distributions are restricted if capital falls below the MDA threshold.

BaFin has classified DZ BANK as an other systemically important institution (O-SII) since 2016. The DZ BANK banking group had to comply with an **O-SII capital buffer** (comprising common equity Tier 1 capital) as defined in section 10g (1) KWG at a level of 1.00 percent in 2022.

Because of the COVID-19 pandemic, the supervisory authorities introduced various relief measures for banks, including in relation to the binding minimum capital requirements. For example, a bank can temporarily use up its capital conservation buffer and O-SII capital buffer without incurring sanctions. In such an eventuality, it must submit a capital conservation plan to the supervisory authorities. If, as a result, the combined capital buffer requirement and thus the threshold for the maximum distributable amount are no longer met, the rules regarding the limits for distributions continue to apply. The aforementioned relief measures are not taken into account in Fig. 10 and ended on December 31, 2022.

In addition to the aforementioned mandatory Pillar 2 component, there is a recommended own funds amount under Pillar 2 (Pillar 2 guidance, P2G), which likewise is determined from the SREP, but unlike the mandatory component relates only to common equity Tier 1 capital. Failure to comply with P2G does not constitute a breach of regulatory capital requirements and has no influence on the MDA threshold. Nevertheless, this figure is relevant as an early warning indicator. Until December 31, 2022, banks were also not required to comply with the Pillar 2 guidance due to the aforementioned relief measures in connection with the COVID-19 pandemic.

Furthermore, the supervisory authorities in some countries reduced the capital buffer rates used to calculate the countercyclical capital buffer, in some cases lowering them right down to 0 percent. In a general administrative act dated January 31, 2022, BaFin raised Germany's countercyclical capital buffer rate from 0 percent to 0.75 percent. In a general administrative act dated March 30, 2022, BaFin then introduced a systemic risk buffer for the domestic residential real estate sector of 2 percent of the risk-weighted assets attributable to these exposures. These two buffers are to be met using common equity Tier 1 capital and will result in higher minimum requirements for the common equity Tier 1 capital ratio, the Tier 1 capital ratio, and the total capital ratio. The new buffers are to be achieved by no later than February 1, 2023.

Both the mandatory and the recommended minimum capital requirements specified by the supervisory authorities were fully complied with as at December 31, 2022.

5 Capital adequacy

Table EU OVC – ICAAP information

(Article 438 sentence 1 letters a and c CRR)

5.1 Strategy, organization, and responsibility

(Article 438 sentence 1 letters a and c CRR)

The management of capital adequacy is an integral component of business management in the DZ BANK Group and the management units. Capital adequacy is defined as the holding of sufficient capital to cover the risks assumed by the business. It is considered from both an economic and a normative perspective. Whereas the economic perspective takes into account the requirements of the ECB Guide to the ICAAP and MaRisk BA, the normative perspective – while also taking account of the ECB Guide to the ICAAP – additionally applies the requirements from the CRR and the German national requirements for the implementation of the CRD.

The aim of the ICAAP is to ensure that, from two complementary perspectives (the economic and the normative perspectives), **capital resources are adequate** for an institution to be able to continue operating. Both perspectives are equally valid management approaches. They are integrated mainly on the basis of the risk inventory check, which the management uses to determine and specify the main risks in the DZ BANK Group.

All management units are included in the groupwide management of capital adequacy. Management of economic and normative capital adequacy aims to ensure that the assumption of risk is consistent with the capital resources of the DZ BANK Group, the DZ BANK financial conglomerate, and the DZ BANK banking group.

At DZ BANK, the **Group Finance** division is responsible for monitoring and reporting on regulatory capital adequacy. Regular monitoring is designed to ensure that the applicable minimum regulatory requirements for solvency are met at every reporting date. Monitoring takes place monthly for the DZ BANK financial conglomerate, the DZ BANK banking group, and DZ BANK, and at least quarterly for the R+V Versicherung AG insurance group. The Board of Managing Directors and the supervisory authority are notified of the results within the monthly reports on capital management.

5.2 Economic capital adequacy

(Article 438 sentence 1 letters a and c CRR)

All material risks affecting capital resources are managed on the basis of groupwide risk capital management. The aim of risk capital management is to ensure the availability of capital resources that are commensurate with the risks assumed (capital adequacy).

Economic capital management is based on internal risk measurement methods that take into account all types of risk that are material from a capital adequacy perspective. The risk capital requirement is determined by aggregating the relevant risk types of all management units. The methods selected serve to meet the statutory requirements for a groupwide integrated risk capital management system.

In the risk-bearing-capacity analysis, the risk capital requirement (including capital buffer) is compared with the available internal capital (internally defined capital) in order to determine the economic capital adequacy. The Board of Managing Directors determines a limit for the risk capital requirement (including capital buffer) for a particular year on the basis of the available internal capital. This limit is then broken down by risk type and entity for operational management purposes. If necessary, the limits can be adjusted during the year, e.g. if economic conditions change.

Available internal capital corresponds to the internal capital – as defined using economic criteria as at the date on which risk-bearing capacity is calculated – that is available to cover losses. It is reviewed on a quarterly basis and, to some extent, on a monthly basis.

Owing to the close ties between the management of economic capital adequacy at DZ BANK and that of the DZ BANK Group, the information below also applies to DZ BANK.

5.2.1 Measurement methods

(Article 438 sentence 1 letters a and c CRR)

The **economic perspective** is an internally defined management perspective aimed at ensuring that all of the DZ BANK Group's material capital risks are fully backed by capital plus an internally specified management buffer. The economic perspective is based on the assumption that an institution will continue to operate as a going concern.

The economic perspective is based on internal risk measurement methods that take into account all types of risk that are material with regard to capital adequacy. The methods selected ensure that risk capital management is integrated across the group.

In the **risk-bearing-capacity analysis**, the risk capital requirement is compared with the available internal capital.

The risk capital requirement is determined by aggregating the capital required for the various risk types relevant to the DZ BANK Group. The **capital buffer requirement** is taken into account. Its purpose is to cover the lack of precision in some areas of risk measurement. A distinction is made between centralized and decentralized capital buffer requirements. Decentralized capital buffer requirements are managed within the limits for the individual risk types, whereas the centralized capital buffer is managed on the basis of a limit covering all sectors and risk types.

Available internal capital is the economic value of equity. The equity used to determine available internal capital is the equity recognized on the balance sheet as calculated in accordance with the relevant accounting standards, plus/minus reserves and liabilities in respect of assets and liabilities, measured at present value. Adjustments are also made, in particular the deduction of components of additional Tier 1 capital.

The available internal capital is determined as follows:

- The available internal capital of the **Bank sector** is calculated on the basis of the IFRS data in accordance with regulatory financial reporting. In this process, R+V is not fully consolidated but taken into account using the equity method.
- The available internal capital of the **Insurance sector** is based on the own funds of the R+V Versicherung AG insurance group in accordance with Solvency II.
- The available internal capital from the two sectors is combined to produce the available internal capital of the DZ BANK Group. During this process, the effects of consolidation between the Bank and Insurance sectors are taken into account, resulting in a reduction in the available internal capital at group level.

5.2.2 Traffic light system

(Article 438 sentence 1 letters a and c CRR)

Economic capital adequacy is monitored and managed using a traffic light system based on the ratio of available internal capital to aggregate risk (expressed as a percentage). The switch from green to amber in the traffic light system (**amber threshold**) is set at the internal threshold value for economic capital adequacy specified in the risk appetite statement, which in 2022 was unchanged compared with the previous year at 120 percent. The amber threshold serves as an early warning indicator. The **red threshold**, i.e. the borderline between amber and red in the traffic light system, was set at 110 percent in the year under review, again unchanged compared with 2021. The threshold values for economic capital adequacy are reviewed annually and adjusted if necessary.

5.3 Regulatory capital adequacy

(Article 437 and article 438 CRR)

Regulatory capital adequacy is defined as the holding of sufficient capital to cover the risks assumed by the business. The Board of Managing Directors and the supervisory authority are notified of the results within the monthly reports on capital management.

5.3.1 Own funds

(Article 437 CRR)

The regulatory own funds of the DZ BANK banking group are derived from the provisions of the CRR/CRD. Pursuant to the provisions of the CRR (article 25 et seq.), regulatory own funds consist of common equity Tier 1 capital (CET1), additional Tier 1 capital (AT1), and Tier 2 capital (T2). They are based on the carrying amounts recognized under IFRS and essentially comprise the equity reported on the balance sheet, hybrid capital instruments, and subordinated liabilities.

The figure below (Fig. 11) shows the DZ BANK banking group's own funds as defined by article 437 sentence 1 letters a, d, e, and f CRR in conjunction with Implementing Regulation (EU) 2021/637 dated March 15, 2021. These disclosures relate to all the entities consolidated for regulatory purposes in the DZ BANK banking group.

It takes into account own funds as calculated in accordance with IFRS, including the deductions that are relevant for regulatory purposes, and the adjustment to the CRR relating to the transitional provisions to soften the impact of implementing IFRS 9 pursuant to article 473a CRR (Regulation (EU) 2020/873).

FIG. 11 – EU CC1 – COMPOSITION OF REGULATORY OWN FUNDS
(Article 437 sentence 1 letters a, d, e, and f CRR)

		a)	a)	b)
€ million		Amounts Dec. 31, 2022	Amounts Jun. 30, 2022	Source based on reference numbers/ letters of the balance sheet under the regulatory scope of consolidation
Common equity Tier 1 capital (CET1): instruments and reserves				
1	Capital instruments and related share premium accounts	10,478	10,478	35, 36
	of which: instrument type 1	-	-	-
	of which: instrument type 2	-	-	-
	of which: instrument type 3	-	-	-
2	Retained earnings	9,733	9,397	37
3	Accumulated other comprehensive income (and other reserves)	-968	426	37, 38
EU-3a	Fund for general banking risks	-	-	-
4	Amount of qualifying items referred to in article 484 (3) CRR and the related share premium accounts subject to phase out from CET1	-	-	42
5	Non-controlling interests (amount allowed in consolidated CET1)	36	33	42
EU-5a	Independently reviewed interim profits net of any foreseeable charge or dividend	1,145	472	41
6	**Common equity Tier 1 capital (CET1) before regulatory adjustments**	**20,424**	**20,806**	**-**
Common equity Tier 1 capital (CET1): regulatory adjustments				
7	Additional value adjustments (negative amount)	-365	-424	-
8	Intangible assets (net of related tax liability) (negative amount)	-574	-571	7, 14, 15, 28
9	Not applicable			
10	Deferred tax assets that rely on future profitability, excluding those arising from temporary differences (net of related tax liability where the conditions in article 38 (3) CRR are met) (negative amount)	-28	-5	11
11	Fair value reserves related to gains and losses on cash flow hedges of financial instruments that are not recognized at fair value	-	-	-

€ million		a) Amounts Dec. 31, 2022	a) Amounts Jun. 30, 2022	b) Source based on reference numbers/ letters of the balance sheet under the regulatory scope of consolidation
12	Negative amounts resulting from the calculation of expected loss amounts	-80	-108	-
13	Any increase in equity arising from securitized assets (negative amount)	-	-	-
14	Gains or losses on liabilities recognized at fair value resulting from changes in own credit standing	-88	103	-
15	Defined benefit pension fund assets (negative amount)	-19	-21	-
16	Direct, indirect and synthetic holdings by an institution of own CET1 instruments (negative amount)	-	-	-
17	Direct, indirect and synthetic holdings by the institution of the CET1 instruments of financial-sector entities where those entities have reciprocal cross-holdings with the institution designed to artificially inflate the institution's own funds (negative amount)	-7	-7	-
18	Direct, indirect and synthetic holdings by the institution of CET1 instruments of financial-sector entities where the institution does not have a significant investment in those entities (above 10% and net of eligible short positions) (negative amount)	-	-	-
19	Direct, indirect and synthetic holdings by the institution of CET1 instruments of financial-sector entities where the institution has a significant investment in those entities (above 10% and net of eligible short positions) (negative amount)	-	-	-
20	Not applicable			
EU-20a	Exposure arising from the following items qualifying for a risk weight of 1,250%, where the institution opts for the deduction alternative	-19	-15	-
EU-20b	of which: qualifying holdings outside the financial sector (negative amount)	-	-	-
EU-20c	of which: securitization exposures (negative amount)	-19	-15	-
EU-20d	of which: free deliveries (negative amount)	-	-	-
21	Deferred tax assets arising from temporary differences (amount above 10% threshold, net of related tax liability where the conditions in article 38 (3) CRR are met) (negative amount)	-	-	-
22	Amount exceeding the 17.65% threshold (negative amount)	-	-	-
23	of which: direct, indirect and synthetic holdings by the institution of CET1 instruments of financial-sector entities where the institution has a significant investment in those entities	-	-	-
24	Not applicable			
25	of which: deferred tax assets arising from temporary differences	-	-	-
EU-25a	Losses for the current financial year (negative amount)	-	-	-
EU-25b	Foreseeable tax charges relating to CET1 items except where the institution suitably adjusts the amount of CET1 items insofar as such tax charges reduce the amount up to which those items may be used to cover risks or losses (negative amount)	-	-	-
26	Not applicable			
27	Qualifying AT1 deductions that exceed the AT1 items of the institution (negative amount)	-	-	-
27a	Other regulatory adjustments	-481	-413	-
28	**Total regulatory adjustments to common equity Tier 1 capital (CET1)**	**-1,662**	**-1,462**	-
29	**Common equity Tier 1 capital (CET1)**	**18,762**	**19,343**	-
Additional Tier 1 capital (AT1): instruments				
30	Capital instruments and related share premium accounts	2,150	2,150	40
31	of which: classified as equity under applicable accounting standards	2,150	2,150	40
32	of which: classified as liabilities under applicable accounting standards	-	-	-

€ million		a) Amounts Dec. 31, 2022	a) Amounts Jun. 30, 2022	b) Source based on reference numbers/ letters of the balance sheet under the regulatory scope of consolidation
33	Amount of qualifying items referred to in article 484 (4) CRR and the related share premium accounts subject to phase out from AT1	-	-	-
EU-33a	Amount of qualifying items referred to in article 494a (1) CRR subject to phase out from AT1	-	-	-
EU-33b	Amount of qualifying items referred to in article 494b (1) CRR subject to phase out from AT1	-	-	-
34	Qualifying Tier 1 capital instruments included in consolidated AT1 capital (including non-controlling interests not included in row 5) issued by subsidiaries and held by third parties	-	11	42
35	of which: instruments issued by subsidiaries subject to phase out	-	-	-
36	**Additional Tier 1 capital (AT1) before regulatory adjustments**	**2,150**	**2,161**	**-**
Additional Tier 1 capital (AT1): regulatory adjustments				
37	Direct, indirect and synthetic holdings by an institution of its own AT1 instruments (negative amount)	-	-	-
38	Direct, indirect and synthetic holdings by the institution of the AT1 instruments of financial-sector entities where those entities have reciprocal cross-holdings with the institution designed to artificially inflate the institution's own funds (negative amount)	-	-	-
39	Direct, indirect and synthetic holdings by the institution of AT1 capital instruments of financial-sector entities where the institution does not have a significant investment in those entities (above 10% and net of eligible short positions) (negative amount)	-	-	-
40	Direct, indirect and synthetic holdings by the institution of AT1 instruments of financial-sector entities where the institution has a significant investment in those entities (net of eligible short positions) (negative amount)	-	-	-
41	Not applicable			
42	Qualifying T2 deductions that exceed the T2 items of the institution (negative amount)	-	-	-
42a	Other regulatory adjustments to AT1 capital	-	-	-
43	**Total regulatory adjustments to additional Tier 1 capital (AT1)**	**-**	**-**	**-**
44	**Additional Tier 1 capital (AT1)**	**2,150**	**2,161**	**-**
45	**Tier 1 capital (T1 = CET1 + AT1)**	**20,912**	**21,504**	**-**
Tier 2 capital (T2): instruments				
46	Capital instruments and related share premium accounts	3,758	2,324	30, 40
47	Amount of qualifying items referred to in article 484 (5) CRR and the related share premium accounts subject to phase out from T2 as described in article 486 (4) CRR	-	-	-
EU-47a	Amount of qualifying items referred to in article 494a (2) CRR subject to phase out from T2	-	-	-
EU-47b	Amount of qualifying items referred to in article 494b (2) CRR subject to phase out from T2	-	-	-
48	Qualifying own funds instruments in consolidated T2 capital (including non-controlling interests and AT1 instruments not included in rows 5 or 34) issued by subsidiaries and held by third parties	5	16	42
49	of which: instruments issued by subsidiaries subject to phase out	-	-	-
50	Credit risk adjustments	365	291	-
51	**Tier 2 capital (T2) before regulatory adjustments**	**4,127**	**2,631**	**-**
Tier 2 capital (T2): regulatory adjustments				
52	Direct, indirect and synthetic holdings by an institution of its own T2 instruments and subordinated loans (negative amount)	-50	-50	-

€ million		a) Amounts Dec. 31, 2022	a) Amounts Jun. 30, 2022	b) Source based on reference numbers/ letters of the balance sheet under the regulatory scope of consolidation
53	Direct, indirect and synthetic holdings by the institution of the T2 instruments and subordinated loans of financial-sector entities where those entities have reciprocal cross-holdings with the institution designed to artificially inflate the institution's own funds (negative amount)	-	-	-
54	Direct, indirect and synthetic holdings by the institution of T2 instruments and subordinated loans of financial-sector entities where the institution does not have a significant investment in those entities (above 10% and net of eligible short positions) (negative amount)	-	-	-
54a	Not applicable			
55	Direct, indirect and synthetic holdings by the institution of T2 instruments and subordinated loans of financial-sector entities where the institution has a significant investment in those entities (net of eligible short positions) (negative amount)	-1	-1	-
56	Not applicable			
EU-56a	Qualifying eligible liability deductions that exceed the eligible liability items of the institution (negative amount)	-	-	-
EU-56b	Other regulatory adjustments to T2 capital[1]	-269	-208	-
57	**Total regulatory adjustments to Tier 2 capital (T2)**	**-320**	**-259**	**-**
58	**Tier 2 capital (T2)**	**3,807**	**2,372**	**-**
59	**Total capital (TC = T1 + T2)**	**24,719**	**23,876**	**-**
60	**Total risk exposure amount**	**137,379**	**145,208**	**-**
Capital ratios and requirements, including buffers				
61	Common equity Tier 1 capital ratio	13.66	13.32	-
62	Tier 1 capital ratio	15.22	14.81	-
63	Total capital ratio	17.99	16.44	-
64	Institution CET1 overall capital requirements	9.00	8.98	-
65	of which: capital conservation buffer requirement	2.50	2.50	-
66	of which: countercyclical capital buffer requirement	0.05	0.02	-
67	of which: systemic risk buffer requirement	-	-	-
EU-67a	of which: global systemically important institution (G-SII) or other systemically important institution (O-SII) buffer requirement	1.00	1.00	-
EU-67b	of which: additional capital requirements to address risks other than the risk of excessive leverage	0.96	0.96	-
68	**Common equity Tier 1 capital ratio (as a percentage of risk exposure amount) available after meeting the minimum capital requirements[2]**	**7.95**	**6.74**	**-**
National minimum requirements (if different from Basel III)				
69	Not applicable			
70	Not applicable			
71	Not applicable			
Amounts below threshold for deductions (before risk weight)				
72	Direct and indirect holdings of own funds instruments or eligible liabilities instruments of financial-sector entities where the institution does not have a significant investment in those entities (less than 10% and net of eligible short positions)	964	1,038	-
73	Direct and indirect holdings by the institution of CET1 instruments of financial-sector entities where the institution holds a significant investment in those entities (amount below 17.65% threshold and net of eligible short positions)	152	220	-
74	Not applicable			
75	Deferred tax assets arising from temporary differences (amount below 17.65% threshold, net of related tax liability where the conditions in article 38 (3) CRR are met)	1,388	1,077	-

€ million		a) Amounts Dec. 31, 2022	a) Amounts Jun. 30, 2022	b) Source based on reference numbers/ letters of the balance sheet under the regulatory scope of consolidation
Applicable caps on the inclusion of provisions in Tier 2 capital				
76	Credit risk adjustments included in Tier 2 capital in respect of exposures subject to the standardized approach (prior to application of cap)	-	-	-
77	Cap on inclusion of credit risk adjustments in Tier 2 capital under standardized approach	369	374	-
78	Credit risk adjustments included in Tier 2 capital in respect of exposures subject to internal ratings-based approach (prior to application of cap)	365	291	-
79	Cap on inclusion of credit risk adjustments in Tier 2 capital under internal ratings based approach	494	523	-
Capital instruments subject to phase-out arrangements (only applicable between January 1, 2014 and January 1, 2022)				
80	Current cap on CET1 instruments subject to phase-out arrangements	-	-	-
81	Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities)	-	-	-
82	Current cap on AT1 instruments subject to phase-out arrangements	-	-	-
83	Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities)	-	-	-
84	Current cap on T2 instruments subject to phase-out arrangements	-	-	-
85	Amount excluded from T2 due to cap (excess over cap after redemptions and maturities)	-	-	-

1 Relates to the IFRS 9 transitional provisions.
2 Including Pillar 2 requirement for CET1 of 0.98 percent (equates to 56.25 percent of the total P2R requirement of 1.75 percent).

Tier 1 capital (T1) is the sum of common equity Tier 1 capital (CET1) and additional Tier 1 capital (AT1).

Common equity Tier 1 capital largely consists of paid-in capital, the capital reserve, retained earnings, and non-controlling interests. Under the CRR, certain assets have to be deducted directly from capital. Apart from a few exceptions, all of these deductions have to be made from common equity Tier 1 capital. They are partly derived from additional regulatory valuation adjustments, from intangible assets, from deferred income tax assets, and from shortfalls resulting from the comparison between expected losses (ELs) and the loss allowances recognized in this regard.

Common equity Tier 1 capital (CET1) amounted to €18,762 million as at the reporting date, a decrease of €582 million compared with the amount of €19,343 million as at June 30, 2022 (Fig. 11, row 29).

This decrease was primarily due to a €1,393 million fall in cumulative other comprehensive income (Fig. 11, row 3) to a loss of €968 million as at the reporting date (June 30, 2022: income of €426 million). The decrease in CET1 was predominantly attributable to temporary accounting effects at R+V. As a member of the DZ BANK Group, R+V already has to measure its assets at fair value in accordance with IFRS 9. Equity and liabilities, and therefore liabilities to policyholders, will only be treated in the same way after the transition to IFRS 17 in the coming year. This led to a temporary technical interest-rate risk caused by the strong increase in interest rates in 2022.

The decrease was partly offset by a €673 million rise in qualifying profit from €472 million as at June 30, 2022 to €1,145 million as at the reporting date (Fig. 11, row 5a). This rise takes account of the dividend activities decided upon for 2022 in an amount of €358 million. Furthermore, common equity Tier 1 capital grew by €226 million owing to the reversal of the fund for home savings risk at BSH, which meant that it no longer had to be deducted from CET1.

Additional Tier 1 capital (AT1) declined by €11 million to €2,150 million as at the reporting date (June 30, 2022: €2,161 million) (Fig. 11, row 44).

As at the reporting date, **Tier 2 capital (T2)** amounted to €3,807 million, which was up by €1,435 million compared with the amount of €2,372 million as at June 30, 2022 (Fig. 11, row 58).

This increase was mainly due to the following factors:

- Capital instruments and related share premium accounts rose by €1,434 million to €3,758 million (June 30, 2022: €2,324 million) (Fig. 11, row 46) as a result of T2 issues of €1,555 million in the third quarter of 2022.
- Eligible credit risk adjustments (Fig. 11, row 50) went up by €74 million to €365 million (June 30, 2022: €291 million).
- The negative adjustment recognized in T2 (Fig. 11, row 56b) as a result of application of the IFRS 9 transitional provisions increased by €61 million to €269 million (June 30, 2022: €208 million).

International Financial Reporting Standard 9 (IFRS 9) came into effect on January 1, 2018. Since June 30, 2020, the DZ BANK banking group has been using the regulatory transitional provisions for the effects of initial application of IFRS 9 in accordance with the revised article 473a CRR (Regulation (EU) 2019/876).

The figure below provides an overview of the own funds, capital ratios, and leverage ratios, in each case including and excluding the effects of the IFRS 9 transitional provisions. The option provided by the CRR quick fix to exclude certain public-sector unrealized gains and losses measured at fair value through other comprehensive income (FVOCI) from the calculation of CET1 in the period January 1, 2020 to December 31, 2022 (article 468 CRR) was not used as at the reporting date.

FIG. 12 – IFRS 9/ARTICLE 468 CRR – FULLY IMPLEMENTED: COMPARISON OF THE INSTITUTIONS' OWN FUNDS, CAPITAL RATIOS, AND LEVERAGE RATIOS, APPLYING AND NOT APPLYING THE IFRS 9 TRANSITIONAL PROVISIONS OR COMPARABLE EXPECTED CREDIT LOSSES AND APPLYING AND NOT APPLYING THE TEMPORARY TREATMENT PURSUANT TO ARTICLE 468 CRR

€ million		a Dec. 31, 2022	b Sep. 30, 2022	c Jun. 30, 2022	d Mar. 31, 2022	e Dec. 31, 2021
Available capital (amounts)						
1	Common equity Tier 1 capital (CET1)	18,762	17,637	19,343	20,808	23,026
2	Common equity Tier 1 capital (CET1) not applying the IFRS 9 transitional provisions or comparable expected credit losses	18,564	17,484	19,181	20,680	22,850
2a	Common equity Tier 1 capital (CET1) not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468 CRR	-	-	-	-	-
3	Tier 1 capital	20,912	19,793	21,504	22,969	25,188
4	Tier 1 capital not applying the IFRS 9 transitional provisions or comparable expected credit losses	20,714	19,639	21,342	22,841	25,012
4a	Tier 1 capital not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468	-	-	-	-	-
5	Total capital	24,719	23,700	23,876	25,395	27,734
6	Total capital not applying the IFRS 9 transitional provisions or comparable expected credit losses	24,790	23,738	23,923	25,418	27,690

€ million		a Dec. 31, 2022	b Sep. 30, 2022	c Jun. 30, 2022	d Mar. 31, 2022	e Dec. 31, 2021
6a	Total capital not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468 CRR	-	-	-	-	-
Risk-weighted assets (amounts)						
7	Total amount of risk-weighted assets	137,379	146,348	145,208	147,489	150,137
8	Total amount of risk-weighted assets not applying the IFRS 9 transitional provisions or comparable expected credit losses	137,320	146,293	145,154	147,439	150,052
Capital ratios						
9	Common equity Tier 1 capital (as a percentage of total exposure)	13.66	12.05	13.32	14.11	15.34
10	Common equity Tier 1 capital (as a percentage of total exposure) not applying the IFRS 9 transitional provisions or comparable expected credit losses	13.52	11.95	13.21	14.03	15.23
10a	Common equity Tier 1 capital (as a percentage of total exposure) not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468 CRR	-	-	-	-	-
11	Tier 1 capital (as a percentage of total exposure)	15.22	13.52	14.81	15.57	16.78
12	Tier 1 capital (as a percentage of total exposure) not applying the IFRS 9 transitional provisions or comparable expected credit losses	15.08	13.42	14.70	15.49	16.67
12a	Tier 1 capital (as a percentage of total exposure) not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468 CRR	-	-	-	-	-
13	Total capital (as a percentage of total exposure)	17.99	16.19	16.44	17.22	18.47
14	Total capital (as a percentage of total exposure) not applying the IFRS 9 transitional provisions or comparable expected credit losses	18.05	16.23	16.48	17.24	18.45
14a	Total capital (as a percentage of total exposure) not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468 CRR	-	-	-	-	-
Leverage ratio						
15	Leverage ratio total exposure measure	440,948	488,957	479,718	355,871	345,571
16	Leverage ratio	4.74	4.05	4.48	6.45	7.29
17	Leverage ratio not applying the IFRS 9 transitional provisions or comparable expected credit losses	4.70	4.02	4.45	6.42	7.24
17a	Leverage ratio not applying the temporary treatment of unrealized gains and losses recognized at fair value through other comprehensive income pursuant to article 468 CRR	-	-	-	-	-

Use of the IFRS 9 transitional provisions pursuant to article 473a CRR affects total capital – particularly CET1 and T2 – and the RWEAs. The positive adjustment for CET1 increased by €44 million to €198 million as at

December 31, 2022 (September 30, 2022: €153 million) and the negative adjustment to T2 rose by €78 million to €269 million (September 30, 2022: €191 million). This resulted in a contraction in total capital of €72 million, which was €34 million more than the decrease of €38 million as at September 30, 2022. Although application of these transitional provisions meant that the adjustment of RWEAs increased by €59 million (September 30, 2022: €54 million), the CET1 capital ratio and the T1 capital ratio each improved by 0.14 percentage points compared with the ratios if these transitional provisions are not applied. In respect of the total capital ratio, there was a small negative effect of 0.06 percentage points.

Consequently, the leverage ratio total exposure measure had to be adjusted by €328 million (September 30, 2022: €246 million). This resulted in a leverage ratio of 4.74 percent. If these IFRS 9 transitional provisions were not applied, the leverage ratio would be 4.70 percent.

Main features of regulatory own funds instruments and eligible liabilities instruments

(Article 437 sentence 1 letters b and c CRR; table EU CCA)

Pursuant to article 437 letter b CRR, the DZ BANK banking group is obliged to disclose a description of the main features of the common equity Tier 1, additional Tier 1, and Tier 2 capital instruments issued by the DZ BANK banking group (and its subsidiaries).

The overview of the main features of the capital instruments is published as an appendix to the DZ BANK banking group's regulatory risk report as at the relevant reporting date and can be found on the website in the Investor Relations/Reports section under Latest Reports and Report Archive:

https://www.dzbank.com/content/dzbank/en/home/dz-bank/investor-relations/reports.html

In accordance with article 437 letter c CRR, the DZ BANK banking group is also required to disclose the full terms and conditions for all common equity Tier 1, additional Tier 1, and Tier 2 capital instruments. The complete contractual terms and conditions can be downloaded at

https://www.dzbank.de/content/dzbank/de/library/disclaimerlibrary/disclaimer_kapitalinstrumente.html

5.3.2 Reconciliation of equity reported on the balance sheet with regulatory own funds of the DZ BANK banking group

(Article 437 sentence 1 letter a CRR)

One of the disclosure requirements is a reconciliation of equity reported under IFRS with equity reported for companies consolidated for regulatory purposes (Financial Reporting, FINREP). The reconciliation with regulatory own funds (Common Reporting, COREP) is disclosed by making reference to template EU CC1 (Fig. 11).

The reconciliation as at the reporting date is shown in Fig. 13.

FIG. 13 – EU CC2 – RECONCILIATION OF REGULATORY OWN FUNDS TO BALANCE SHEET IN THE AUDITED FINANCIAL STATEMENTS
(Article 437 sentence 1 letter a CRR)

		a)	b)	a)	b)	c)
		Balance sheet in published financial statements	Under regulatory scope of consolidation	Balance sheet in published financial statements	Under regulatory scope of consolidation	Reference[1]
€ million		Dec. 31, 2022	Dec. 31, 2022	Jun. 30, 2022	Jun. 30, 2022	
Assets – breakdown by asset class according to the balance sheet in the published annual financial statements						
1	Cash and cash equivalents	93,717	93,862	112,948	113,140	-
2	Loans and advances to banks	123,444	123,173	115,946	115,742	-
3	Loans and advances to customers	203,646	205,647	203,002	204,862	-
4	Hedging instruments (positive fair values)	1,568	1,568	948	948	-
5	Financial assets held for trading	48,909	49,369	60,628	61,299	-
6	Investments	43,393	48,261	45,448	51,486	-
7	of which: goodwill	29	292	29	-	8
8	Investments held by insurance companies	105,955	-	111,914	-	-
9	Property, plant and equipment, investment property, and right-of-use assets	1,960	1,980	1,882	1,904	-
10	Income tax assets	3,428	1,536	2,966	1,229	-
11	of which: deferred tax assets on tax loss carryforwards	91	28	8	5	10
12	of which: deductible deferred tax assets on temporary differences	3,053	1,362	2,705	1,049	25
13	Other assets	7,204	3,189	7,300	3,444	-
14	of which: goodwill	155	155	155	155	8
15	of which: intangible assets	653	543	648	528	8
16	Loss allowances	-2,029	-2,072	-1,874	-1,918	-
17	Non-current assets and disposal groups classified as held for sale	19	19	43	38	-
18	Fair value changes of the hedged items in portfolio hedges of interest-rate risk	-4,173	-4,173	-2,495	-2,495	-
19	**Total assets**	**627,041**	**522,359**	658,657	549,681	-
Liabilities – breakdown by liability class according to the balance sheet in the published annual financial statements						
20	Deposits from banks	186,787	186,995	202,655	202,746	-
21	Deposits from customers	159,429	165,999	163,668	169,917	-
22	Debt certificates issued including bonds	82,349	82,580	90,666	90,896	-
23	Hedging instruments (negative fair values)	442	442	550	550	-
24	Financial liabilities held for trading	52,478	52,498	51,695	51,698	-
25	Provisions	3,248	3,341	3,270	3,296	-
26	Insurance liabilities	103,795	-	107,337	-	-

€ million		a) Balance sheet in published financial statements	b) Under regulatory scope of consolidation	a) Balance sheet in published financial statements	b) Under regulatory scope of consolidation	c) Reference[1]
		Dec. 31, 2022	Dec. 31, 2022	Jun. 30, 2022	Jun. 30, 2022	
27	Income tax liabilities	1,063	581	1,179	601	-
28	of which: deferred tax liabilities on intangible assets	21	26	23	29	8
29	Other liabilities	10,999	3,482	10,893	3,524	-
30	Subordinated capital	4,521	4,530	3,106	3,116	-
31	Liabilities included in disposal groups classified as held for sale	-	-	-	-	-
32	Fair value changes of the hedged items in portfolio hedges of interest-rate risk	-1,147	-1,147	-665	-665	-
33	Total liabilities excluding equity	603,964	499,301	634,353	525,679	-
34	Shareholders' equity	21,967	22,547	23,053	23,510	-
35	Subscribed capital	4,926	4,926	4,926	4,926	1
36	Capital reserve	5,551	5,551	5,551	5,551	1
37	Retained earnings[2]	13,482	13,564	13,298	13,142	2, 3, 5a
38	Reserve from other comprehensive income	-4,142	-3,645	-2,873	-2,261	3
39	of which: cash flow hedge reserve	-	-	-	-	11
40	Additional equity components	2,150	2,150	2,150	2,150	30, 31, 46
41	Non-controlling interests	1,109	511	1,251	493	4, 5, 34, 48
42	Equity	23,076	23,058	24,304	24,002	-
43	**Total equity and liabilities**	**627,041**	**522,359**	**658,657**	**549,681**	-

1 The Reference column indicates how the rows in this table refer to the corresponding rows in template EU CC1 (Fig. 11).
2 In 2022, the unappropriated earnings were reclassified to retained earnings.

The differences between the assets and the equity and liabilities reported in the IFRS consolidated financial statements and the DZ BANK banking group's assets and equity and liabilities under FINREP arose from different entities being included in each scope of consolidation and from different consolidation methods.

The variance in the consolidation methods relates to R+V, which was consolidated for regulatory purposes in the DZ BANK banking group using the equity method under FINREP but was fully consolidated in the published consolidated financial statements. As a result, the figure for non-controlling interests was €615 million lower (June 30, 2022: €775 million lower).

Differences in the scope of consolidation also arose at the level of the consolidated subgroups BSH and UMH.

5.3.3 Capital requirements

(Article 436 sentence 1 letter e, article 438 sentence 1 letters d to g, and article 441 CRR)

5.3.3.1 Overview of risk-weighted assets (RWEAs)

(Article 438 sentence 1 letter d CRR)

Fig. 14 gives an overview of the risk-weighted exposure amounts (RWEAs) and the associated capital requirements. The capital requirements in Fig. 14 are shown for **credit risk excluding counterparty credit risk** (CCR) in accordance with the **Standardized Approach to credit risk (CRSA)** and in accordance with the **internal ratings-based approach (IRB approach)** and for **counterparty credit risk**. The capital requirement for **securitizations** also differs under the SEC-SA and SEC-ERBA standardized approaches and under the Internal Assessment Approach (SEC-IAA). The DZ BANK banking group does not use the SEC-IRBA approach. The capital requirement for **market risk** is determined using the Standardized Approach and internal model approach (IMA); for **operational risk**, only the Standardized Approach is used. Row 24 is provided for information and contains amounts below the thresholds for deductions that relate to significant long-term equity investments within the financial sector that are subject to a risk weight of 250 percent and deductions for deferred taxes resulting from temporary differences.

FIG. 14 – EU OV1 – OVERVIEW OF TOTAL RISK EXPOSURE AMOUNTS
(Article 438 sentence 1 letter d CRR)

		Total risk exposure amount (RWEAs)		Total capital requirements
		a	b	c
€ million		Dec. 31, 2022	Sep. 30, 2022	Dec. 31, 2022
1	**Credit risk (excluding CCR)**	**107,412**	**111,211**	**8,593**
2	of which: Standardized Approach	28,437	29,683	2,275
3	of which: foundation IRB (F-IRB) approach	44,395	45,020	3,552
4	of which: slotting approach	7,525	7,745	602
EU 4a	of which: equity exposures under the simple risk-weighted approach	12,280	13,364	982
5	of which: advanced IRB (A-IRB) approach	14,776	15,399	1,182
6	**Counterparty credit risk – CCR**	**6,232**	**8,662**	**499**
7	of which: Standardized Approach	3,316	5,030	265
8	of which: internal model method (IMM)	-	-	-
EU 8a	of which: exposures to a CCP	411	452	33
EU 8b	of which: credit valuation adjustment (CVA)	1,462	1,746	117
9	of which: other CCR	1,043	1,434	83
10	Not applicable			
11	Not applicable			
12	Not applicable			
13	Not applicable			
14	Not applicable			
15	**Transaction processing risk**	**39**	**2**	**3**
16	**Securitization exposure in the banking book (after the cap)**	**5,600**	**5,290**	**448**
17	of which: SEC-IRBA	-	-	-
18	of which: SEC-ERBA (incl. IAA)	4,846	4,560	388
19	of which: SEC-SA	753	730	60
EU 19a	of which: 1,250% / deduction (zero if deducted)[1]	-	-	-
20	**Position, currency, and commodity risks (market risk)**	**7,369**	**10,455**	**589**
21	of which: Standardized Approach	537	752	43
22	of which: IMA	6,832	9,704	547
EU 22a	Large exposures	-	-	-
23	**Operational risk**	**10,727**	**10,727**	**858**
EU 23a	of which: Basic Indicator Approach	-	-	-
EU 23b	of which: Standardized Approach	10,727	10,727	858
EU 23c	of which: Advanced Measurement Approach	-	-	-
24	Amounts below the thresholds for deduction (subject to 250% risk weight) (for information only)	3,788	4,396	303
25	Not applicable			
26	Not applicable			
27	Not applicable			
28	Not applicable			
29	**Total**	**137,379**	**146,348**	**10,990**

[1] As at December 31, 2022, the deduction from own funds (converted into RWEAs) amounted to €237 million (September 30, 2022: €235 million).

The **DZ BANK banking group's regulatory capital requirements** totaled €10,990 million as at the reporting date (September 30, 2022: €11,708 million). This total includes a capital requirement of €8,593 million for credit risk, which is particularly important within the DZ BANK banking group.

The €8,969 million fall in the RWEAs compared with the previous reporting date (row 29) was largely due to the reduction in credit risk, counterparty credit risk, and market risk. The decrease in market risk was almost entirely attributable to the internal market risk model (row 22). Please refer to our explanations relating to Fig. 66 in section 8.5.2. The lower level of counterparty credit risk was due to RWEA optimization measures and to declining exposure amounts for derivatives in the portfolios of DZ BANK and DZ PRIVATBANK (rows 7 and

8b). There were various reasons for the reduction in RWEAs for credit risk: a decrease under the Standardized Approach owing to a decline in deferred tax assets to which threshold deduction treatment is applied at group level and transactions that ended in the corporate customer portfolio of the DZ BANK banking group (row 2); fall in RWEAs for F-IRB exposures due to transactions that ended in the DZ BANK Group (row 3); reduction in RWEAs for long-term equity investments as a result of using the equity method for other long-term equity investments for the first time; contraction of RWEAs for specialized lending due to expansion of the scope of application for the infrastructure supporting factor (row 4); decline in RWEAs for A-IRB exposures in the retail business following improvements in credit quality in BSH's portfolio (row 5).

The preferential treatment of infrastructure projects that is allowed under the CRR quick fix in accordance with article 501 CRR also reduced DZ BANK's RWEAs by €1,293 million in the IRB corporates – specialized lending exposure class.

5.3.3.2 Prudent valuation adjustments (PVAs)

(Article 436 sentence 1 letter e CRR)

FIG. 15 – EU PV1 – PRUDENT VALUATION ADJUSTMENTS (PVAs)
(Article 436 sentence 1 letter e CRR)

€ million		a	b	c	d	e	EU e1	EU e2	f	g	h	f
		Risk category					Category-level AVAs – valuation uncertainties		Category-level total value after diversification			
	Category-level AVAs	Equity exposure risk	Interest rate risk	Currency risk	Credit risk	Commodity risk	AVAs for unearned credit spreads	AVAs for investment and funding costs		of which: total amount for core approach in the trading book	of which: total amount for core approach in the banking book	Category-level total value after diversification as at Dec. 31, 2021
1	Market risk uncertainty	104	95	3	69	0	8	14	196	49	147	204
2	Not applicable											
3	Close-out costs	0	64	1	51	0	-	-	58	18	40	5
4	Concentrated	0	1	0	7	-			8	2	7	7
5	Early	-	-	-	-	-			-	-	-	-
6	Model risk	7	39	1	37	0	0	-	23	5	18	15
7	Operational risk	9	9	0	7	0			25	7	19	21
8	Not applicable											
9	Not applicable											
10	Future administrative expenses	6	20	3	2	-			31	21	10	22
11	Not applicable											
12	**Total additional valuation adjustments (AVAs)[1]**								**365**	**101**	**263**	**304**

1 The total amount also includes the fall-back approach.

The main factor in the rise in additional valuation adjustments (AVAs) for close-out costs was the implementation of improved modeling of prudent bid-ask spreads for fixed-income securities. The increase in the AVAs for future administrative expenses was mainly due to the inclusion of future hedging costs in this category for the first time. The AVAs for model risk were largely attributable to changes in selected valuation models.

5.3.3.3 Countercyclical capital buffer

(Article 440 CRR)

The institution-specific countercyclical capital buffer provides an additional capital buffer consisting of common equity Tier 1 capital that is used to contain excessive growth in lending. It can be drawn on in times of crisis and is designed to stop banks limiting their lending too much. Since March 31, 2016, the capital buffer has had to be determined at the end of each quarter for each banking group individually. In accordance with section 10d (2) KWG, the banking-group-specific buffer rate is the weighted average of the ratios for the countercyclical capital buffers that apply in the following regions: Germany, other countries in the European Economic Area (EEA), and non-EEA countries as well as European and non-European countries, territories, and legal jurisdictions belonging to them in which the banking group's significant exposures defined in accordance with section 36 of the Solvency Regulation (SolvV) are located. Fig. 17 shows the geographical distribution of the relevant credit risk exposures.

BaFin specifies the capital buffer rate for Germany, taking account of any recommendations made by the Ausschuss für Finanzstabilität [Financial Stability Committee]. In a general administrative act dated January 31, 2022, BaFin set Germany's countercyclical capital buffer rate at 0.75 percent of the total exposure amount determined in accordance with article 92 (3) CRR, to be applied for the first time with effect from February 1, 2023.

Fig. 16 shows the level of the banking-group-specific countercyclical buffer.

For the calculation of the institution-specific countercyclical capital buffer as at December 31, 2022, a country-specific buffer rate of more than 0 percent was stipulated for the following twelve countries by their supervisory authority:

- Denmark: 2.00 percent
- Iceland: 2.00 percent
- Norway: 2.00 percent
- Czech Republic: 1.50 percent
- Bulgaria: 1.00 percent
- Estonia: 1.00 percent
- United Kingdom: 1.00 percent
- Hong Kong: 1.00 percent
- Sweden: 1.00 percent
- Slovakia: 1.00 percent
- Luxembourg: 0.50 percent
- Romania: 0.50 percent

The calculation for all other countries was based on a country-specific buffer rate of 0 percent. As at December 31, 2022, the institution-specific buffer rate was 0.05 percent (June 30, 2022: 0.02 percent). The capital requirement for the countercyclical capital buffer, calculated as the product of the institution-specific buffer rate and the total relevant exposures, came to €65 million (June 30, 2022: €31 million).

FIG. 16 – EU CCYB2 – AMOUNT OF THE INSTITUTION-SPECIFIC COUNTERCYCLICAL BUFFER
(Article 440 sentence 1 letter b CRR)

Amount of the institution-specific countercyclical capital buffer			
€ million		**Dec. 31, 2022**	**Jun. 30, 2022**
1	Total risk exposure amount	137,379	145,208
2	Institution-specific countercyclical capital buffer rate	0.05	0.02
3	Institution-specific countercyclical capital buffer requirement	65	31

The figure below provides an overview of the geographical distribution of the exposures relevant to the calculation of the countercyclical capital buffer.

FIG. 17 – EU CCYB1 – GEOGRAPHICAL DISTRIBUTION OF THE CREDIT RISK EXPOSURES RELEVANT TO THE CALCULATION OF THE COUNTERCYCLICAL CAPITAL BUFFER
(Article 440 sentence 1 letter a CRR)

		a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)	m)
		General credit risk exposures		Relevant credit risk exposures – market risk				Capital requirements						
€ million		Exposure value under the Standardized Approach	Exposure value under the IRB approach	Total long and short positions of trading book exposures under the Standardized Approach	Value of trading book exposures (internal models)	Securitization exposures – exposure value in the banking book	Total exposure value	Relevant credit risk exposures – credit risk	Relevant credit risk exposures – market risk	Relevant credit risk exposures – securitization exposures in the banking book	Total	Risk-weighted exposure amounts	Weighting of capital requirements (%)	Countercyclical capital buffer rate (%)
1	Germany	16,102	104,238	8	3,728	3,619	127,695	4,786	298	160	5,245	65,561	74.75	-
2	Egypt	90	2	-	-	-	92	1	-	-	1	7	0.01	-
3	Albania	0	-	-	-	-	0	0	-	-	0	0	-	-
4	Andorra	0	-	-	-	-	0	0	-	-	0	0	-	-
5	Angola	0	-	-	-	-	0	0	-	-	0	0	-	-
6	Argentina	7	11	-	-	-	18	0	-	-	0	2	0.00	-
7	Azerbaijan	24	-	-	-	-	24	1	-	-	1	19	0.02	-
8	Australia	164	759	-	-	11	933	50	-	3	53	661	0.75	-
9	Bahamas	19	-	-	-	-	19	1	-	-	1	19	0.02	-
10	Bahrain	2	33	-	-	-	36	2	-	-	2	30	0.03	-
11	Bangladesh	9	-	-	-	-	9	0	-	-	0	0	0.00	-
12	Belgium	265	100	-	-	22	387	18	-	0	18	226	0.26	-
13	Bermuda	46	-	-	-	-	46	0	-	-	0	5	0.01	-
14	Brazil	1	47	-	-	-	48	4	-	-	4	48	0.05	-
15	British Virgin Islands	1	-	-	-	-	1	0	-	-	0	0	0.00	-
16	Bulgaria	0	0	-	-	-	0	0	-	-	0	0	-	1.00
17	Cayman Islands	130	15	-	-	-	144	6	-	-	6	71	0.08	-
18	Chile	0	-	-	-	-	0	0	-	-	0	0	-	-
19	China	206	544	-	-	-	750	5	-	-	5	58	0.07	-
20	Costa Rica	0	-	-	-	-	0	0	-	-	0	0	-	-
21	Curaçao	0	8	-	-	-	8	2	-	-	2	19	0.02	-
22	Denmark	85	372	-	-	-	457	19	-	-	19	242	0.28	2.00
23	Dominican Republic	0	-	-	-	-	0	0	-	-	0	0	0.00	-
24	Ecuador	0	-	-	-	-	0	0	-	-	0	0	-	-
25	Côte d'Ivoire	1	-	-	-	-	1	0	-	-	0	0	0.00	-

		a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)	m)
		General credit risk exposures		Relevant credit risk exposures – market risk		Securiti-zation exposures – exposure value in the banking book	Total exposure value	Capital requirements				Risk-weighted exposure amounts	Weighting of capital require-ments (%)	Counter-cyclical capital buffer rate (%)
€ million		Exposure value under the Standard-ized Approach	Exposure value under the IRB approach	Total long and short positions of trading book exposures under the Standardized Approach	Value of trading book exposures (internal models)			Relevant credit risk exposures – credit risk	Relevant credit risk expo-sures – market risk	Relevant credit risk exposures – securiti-zation exposures in the banking book	Total			
26	Estonia	0	-	-	-	-	0	0	-	-	0	0	-	1.00
27	Finland	54	240	-	-	64	357	8	-	1	9	112	0.13	-
28	France	1,285	1,554	-	-	397	3,237	79	-	9	89	1,107	1.26	-
29	Georgia	0	-	-	-	-	0	0	-	-	0	0	-	-
30	Ghana	63	7	-	-	-	70	6	-	-	6	76	0.09	-
31	Gibraltar	0	-	-	-	-	0	0	-	-	0	0	-	-
32	Greece	5	0	-	-	-	5	0	-	-	0	4	0.00	-
33	United Kingdom	547	1,547	42	-	368	2,504	94	2	18	113	1,418	1.62	1.00
34	Guatemala	0	-	-	-	-	0	0	-	-	0	0	-	-
35	Guernsey	6	108	-	-	-	114	3	-	-	3	43	0.05	-
36	Hong Kong	45	37	-	2	-	84	10	0	-	11	131	0.15	1.00
37	India	31	129	-	-	-	160	7	-	-	7	88	0.10	-
38	Indonesia	184	-	-	-	-	184	2	-	-	2	29	0.03	-
39	Iraq	25	-	-	-	-	25	-	-	-	-	-	-	-
40	Ireland	215	199	132	-	4	549	24	5	0	29	368	0.42	-
41	Iceland	0	-	-	-	-	0	0	-	-	0	0	-	2.00
42	Isle of Man	0	24	-	-	-	24	0	-	-	0	3	0.00	-
43	Israel	16	4	-	-	-	19	0	-	-	0	3	0.00	-
44	Italy	221	192	1	-	7	421	14	0	0	14	178	0.20	-
45	Jamaica	0	-	-	-	-	0	0	-	-	0	0	-	-
46	Japan	156	73	-	-	-	229	9	-	-	9	116	0.13	-
47	Jersey	4	61	-	-	-	66	4	-	-	4	47	0.05	-
48	Jordan	0	-	-	-	-	0	0	-	-	0	0	0.00	-
49	Canada	724	537	-	-	-	1,261	44	-	-	44	545	0.62	-
50	Kazakhstan	1	-	-	-	-	1	0	-	-	0	0	0.00	-
51	Qatar	52	95	-	-	-	147	7	-	-	7	88	0.10	-
52	Kenya	1	-	-	-	-	1	0	-	-	0	0	-	-
53	Colombia	0	-	-	-	-	0	0	-	-	0	0	-	-

		a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)	m)
		General credit risk exposures		Relevant credit risk exposures – market risk		Securitization exposures – exposure value in the banking book	Total exposure value	Capital requirements				Risk-weighted exposure amounts	Weighting of capital requirements (%)	Countercyclical capital buffer rate (%)
€ million		Exposure value under the Standardized Approach	Exposure value under the IRB approach	Total long and short positions of trading book exposures under the Standardized Approach	Value of trading book exposures (internal models)			Relevant credit risk exposures – credit risk	Relevant credit risk exposures – market risk	Relevant credit risk exposures – securitization exposures in the banking book	Total			
54	Korea, Republic of	35	20	-	-	-	55	1	-	-	1	15	0.02	-
55	Croatia	0	-	-	-	-	0	0	-	-	0	0	0.00	-
56	Kuwait	46	48	-	-	-	94	4	-	-	4	46	0.05	-
57	Latvia	0	-	-	-	-	0	0	-	-	0	0	-	-
58	Liberia	146	-	-	-	-	146	10	-	-	10	126	0.14	-
59	Liechtenstein	26	22	-	-	-	48	4	-	-	4	44	0.05	-
60	Lithuania	0	57	-	-	-	57	1	-	-	1	15	0.02	-
61	Luxembourg	2,399	5,074	0	54	-	7,527	249	4	-	254	3,169	3.61	0.50
62	Malawi	1	-	-	-	-	1	0	-	-	0	0	-	-
63	Malaysia	125	-	-	-	-	125	4	-	-	4	50	0.06	-
64	Malta	45	24	-	-	-	70	5	-	-	5	61	0.07	-
65	Morocco	14	-	-	-	-	14	0	-	-	0	3	0.00	-
66	Marshall Islands	87	-	-	-	-	87	7	-	-	7	90	0.10	-
67	Mauritius	0	-	-	-	-	0	0	-	-	0	0	-	-
68	Mexico	78	65	-	-	-	143	15	-	-	15	193	0.22	-
69	Montenegro	0	-	-	-	-	0	0	-	-	0	0	-	-
70	Myanmar	-	4	-	-	-	4	0	-	-	0	4	0.00	-
71	Namibia	1	1	-	-	-	1	0	-	-	0	1	0.00	-
72	New Zealand	36	124	-	-	-	160	8	-	-	8	95	0.11	-
73	Netherlands	1,226	2,532	11	-	444	4,213	156	0	9	165	2,057	2.35	-
74	Nigeria	3	62	-	-	-	66	5	-	-	5	61	0.07	-
75	North Macedonia	3	-	-	-	-	3	0	-	-	0	1	0.00	-
76	Norway	140	193	-	6	-	339	12	1	-	12	155	0.18	2.00
77	Oman	65	12	-	-	-	76	0	-	-	0	6	0.01	-
78	Austria	228	1,546	-	-	-	1,774	65	-	-	65	813	0.93	-
79	Panama	132	1	-	-	-	133	2	-	-	2	22	0.03	-
80	Papua New Guinea	-	20	-	-	-	20	1	-	-	1	18	0.02	-
81	Paraguay	12	-	-	-	-	12	0	-	-	0	2	0.00	-

€ million		a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)	m)
		General credit risk exposures		Relevant credit risk exposures – market risk				Capital requirements						
		Exposure value under the Standardized Approach	Exposure value under the IRB approach	Total long and short positions of trading book exposures under the Standardized Approach	Value of trading book exposures (internal models)	Securitization exposures – exposure value in the banking book	Total exposure value	Relevant credit risk exposures – credit risk	Relevant credit risk exposures – market risk	Relevant credit risk exposures – securitization exposures in the banking book	Total	Risk-weighted exposure amounts	Weighting of capital requirements (%)	Countercyclical capital buffer rate (%)
82	Peru	49	-	-	-	-	49	4	-	-	4	48	0.05	-
83	Philippines	0	183	-	-	-	184	2	-	-	2	31	0.04	-
84	Poland	9	86	-	-	-	96	6	-	-	6	77	0.09	-
85	Portugal	8	20	-	-	44	71	1	-	1	2	26	0.03	-
86	Romania	1	0	-	-	-	1	0	-	-	0	0	-	0.50
87	Russia	18	439	-	-	-	457	49	-	-	49	607	0.69	-
88	Saudi Arabia	14	198	-	-	-	212	13	-	-	13	158	0.18	-
89	Sweden	115	303	-	5	-	423	13	0	-	14	172	0.20	1.00
90	Switzerland	529	1,316	-	-	141	1,985	76	-	6	82	1,028	1.17	-
91	Senegal	0	-	-	-	-	0	0	-	-	0	0	-	-
92	Serbia and Kosovo	0	-	-	-	-	0	0	-	-	0	0	0.00	-
93	Singapore	119	696	-	-	-	815	30	-	-	30	373	0.43	-
94	Slovakia	0	-	-	-	-	0	0	-	-	0	0	-	1.00
95	Slovenia	0	0	-	-	-	0	0	-	-	0	0	-	-
96	Spain	438	297	2	-	192	929	26	0	7	33	413	0.47	-
97	Sri Lanka	0	-	-	-	-	0	0	-	-	0	0	-	-
98	South Africa	5	0	-	-	-	5	0	-	-	0	1	0.00	-
99	Taiwan	0	46	-	-	-	47	4	-	-	4	47	0.05	-
100	Tanzania	1	-	-	-	-	1	0	-	-	0	0	-	-
101	Thailand	0	33	-	-	-	33	2	-	-	2	26	0.03	-
102	Togo	0	-	-	-	-	0	0	-	-	0	0	-	-
103	Czech Republic	6	77	-	2	-	85	3	0	-	3	40	0.05	1.50
104	Tunisia	-	0	-	-	-	0	0	-	-	0	0	-	-
105	Turkey	461	210	-	-	-	670	6	-	-	6	78	0.09	-
106	Ukraine	3	-	-	-	-	3	0	-	-	0	1	0.00	-
107	Hungary	0	22	-	-	-	22	1	-	-	1	13	0.01	-
108	Uruguay	0	-	-	-	-	0	0	-	-	0	0	-	-
109	USA	2,110	3,773	-	-	2,935	8,818	305	-	165	470	5,879	6.70	-

€ million		a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)	m)
		General credit risk exposures		Relevant credit risk exposures – market risk		Securitization exposures – exposure value in the banking book	Total exposure value	Capital requirements				Risk-weighted exposure amounts	Weighting of capital requirements (%)	Countercyclical capital buffer rate (%)
		Exposure value under the Standardized Approach	Exposure value under the IRB approach	Total long and short positions of trading book exposures under the Standardized Approach	Value of trading book exposures (internal models)			Relevant credit risk exposures – credit risk	Relevant credit risk exposures – market risk	Relevant credit risk exposures – securitization exposures in the banking book	Total			
110	Uzbekistan	10	-	-	-	-	10	0	-	-	0	0	0.00	-
111	Venezuela	0	-	-	-	-	0	0	-	-	0	0	-	-
112	United Arab Emirates	75	172	-	-	-	247	13	-	-	13	168	0.19	-
113	Vietnam	138	4	-	-	-	142	3	-	-	3	31	0.04	-
114	Cyprus	77	17	-	-	-	95	6	-	-	6	71	0.08	-
115	Other countries	64	-	-	-	-	64	4	-	-	4	51	0.06	-
	Total as at Dec. 31, 2022	29,884	128,632	197	3,797	8,246	170,757	6,327	311	379	7,017	87,711	100.00	
	Total as at Jun. 30, 2022	30,158	126,471	617	5,038	8,052	170,337	6,255	418	363	7,036	87,949	100.00	

5.3.3.4 Indicators of global systemic importance

(Article 441 CRR)

BaFin has classified DZ BANK as an other systemically important institution (O-SII) since 2016.

As DZ BANK's total exposure measure within the meaning of article 429 (4) CRR exceeds €200 billion, DZ BANK is obliged, in accordance with section 10f (4) KWG, to participate in the BCBS's annual process for the collection of data in order to analyze indicators for potential global systemic importance.

This Basel analysis process produces a score that is published by the Bank for International Settlements (BIS). DZ BANK's score has been significantly below the threshold for classification as a global systemically important bank (G-SIB) every year since its introduction.

Fig. 18 below shows DZ BANK's results from the data collected for the analysis of indicators for global systemic importance as at December 31, 2022. The key figure with the biggest year-on-year change was the trading volume, which is allocated to the 'substitutability/financial institution infrastructure' indicator. DZ BANK's score for this indicator is far below the threshold for classification as a G-SIB.

The results are determined using specific instructions from the BCBS. For example, insurance subsidiaries are included in the relevant scope of consolidation for a number of indicators. This means that the results are not generally comparable with other published data of DZ BANK. Moreover, changes to the BCBS's specific instructions may mean that the results are not fully comparable with the results for the previous year. The results as at December 31, 2022 are also subject to a routine review as part of the Basel analysis process and may therefore be adjusted.

FIG. 18 – RESULTS FROM THE ANALYSIS OF INDICATORS FOR GLOBAL SYSTEMIC IMPORTANCE

€ million

Indicator	Key figure	Dec. 31, 2022	Dec. 31, 2021
Size	Total exposure	549,696	552,327
Interconnectedness	Intra-financial system assets	243,137	275,558
	Intra-financial system liabilities	268,583	230,716
	Securities outstanding	144,981	111,989
Substitutability/financial institution infrastructure	Payments activity (financial year)	8,977,749	8,208,645
	Assets under custody	237,756	250,356
	Underwritten transactions (financial year)	31,308	32,382
	Trading volume	1,829,705	980,379
Complexity	Notional amount of OTC derivatives	1,644,336	1,512,124
	Trading and available-for-sale securities	13,311	13,857
	Level 3 assets	22,085	24,265
Cross-jurisdictional activity	Cross-jurisdictional claims	122,320	108,179
	Cross-jurisdictional liabilities	71,411	50,247

5.3.3.5 Risk-weighted exposure amounts for specialized lending and long-term equity investments

(Article 438 sentence 1 letters e and f CRR)

Fig. 19 shows the risk exposures contained in the portfolio as at the reporting date for the DZ BANK banking group's specialized lending under the supervisory slotting approach (assignment of risk weights prescribed by the supervisory authority). It also contains exposures for long-term equity investments under the simple risk-weighted approach, for which prescribed risk weights have to be used.

FIG. 19 – EU CR10 – SPECIALIZED LENDING AND EQUITY EXPOSURES UNDER THE SIMPLE RISK-WEIGHTED APPROACH
(Article 438 sentence 1 letter e CRR)

Template EU CR10.1

Specialized lending: project finance (slotting approach)

Regulatory categories	Remaining maturity	On-balance-sheet exposures	Off-balance-sheet exposures	Risk weight	Exposure value	Risk-weighted exposure amount	Expected loss amount
€ million		a	b	c	d	e	f
Category 1	Less than 2.5 years	70	86	50%	122	53	-
	Equal to or more than 2.5 years	1,693	326	70%	1,912	1,147	8
Category 2	Less than 2.5 years	407	686	70%	803	549	3
	Equal to or more than 2.5 years	5,594	1,042	90%	6,283	4,758	46
Category 3	Less than 2.5 years	7	2	115%	9	11	1
	Equal to or more than 2.5 years	245	32	115%	272	305	7
Category 4	Less than 2.5 years	46	0	250%	47	116	4
	Equal to or more than 2.5 years	160	193	250%	304	585	25
Category 5	Less than 2.5 years	27	0	-	27	-	8
	Equal to or more than 2.5 years	55	2	-	56	-	42
Total as at Dec. 31, 2022	**Less than 2.5 years**	**558**	**775**	**-**	**1,008**	**729**	**16**
	Equal to or more than 2.5 years	**7,747**	**1,596**	**-**	**8,827**	**6,795**	**128**
Total as at Jun. 30, 2022	Less than 2.5 years	493	740	-	903	668	16
	Equal to or more than 2.5 years	7,355	1,428	-	8,347	6,675	128

The portfolio grew slightly owing to changes to it in the second half of 2022.

The figure below, EU CR10.5, provides an overview of equity exposures under the simple risk-weighted approach.

Template EU CR10.5

Equity exposures under the simple risk-weighted approach

Categories	On-balance-sheet exposures	Off-balance-sheet exposures	Risk weight	Exposure value	Risk-weighted exposure amount	Expected loss amount
€ million	**a**	**b**	**c**	**d**	**e**	**f**
Private equity exposures	-	-	190%	-	-	-
Exchange-traded equity exposures	-	-	290%	-	-	-
Other equity exposures	3,319	0	370%	3,319	12,280	80
Total as at Dec. 31, 2022	**3,319**	**0**	**-**	**3,319**	**12,280**	**80**
Total as at Jun. 30, 2022	4,490	0	-	4,490	16,613	108

The decrease in the RWEAs was essentially due to the lower valuation of R+V, calculated in accordance with the equity method, and to the use of the equity method for other long-term equity investments for the first time.

Templates EU CR10.2, EU CR10.3, and EU CR10.4 are not relevant to the DZ BANK banking group.

FIG. 20 – EU INS1 – NON-DEDUCTED PARTICIPATIONS IN INSURANCE UNDERTAKINGS AS AT DECEMBER 31, 2022
(Article 438 sentence 1 letter f CRR)

		a	b	a	b
		Dec. 31, 2022		Dec. 31, 2021	
€ million		**Exposure value**	**Exposure amount**	Exposure value	Exposure amount
1	Own funds instruments held in insurance companies, reinsurance companies, or insurance holding companies not deducted from own funds	3,180	11,764	7,312	27,054

The €15,289 million reduction in RWEAs was mainly the result of the fall in R+V's carrying amount, calculated in accordance with the equity method.

5.3.3.6 Financial conglomerate solvency

(Article 438 letter g CRR)

The German Supervision of Financial Conglomerates Act (FKAG) forms the main legal basis for the supervision of the DZ BANK financial conglomerate. The calculation methodology for the coverage ratio is governed by Commission Delegated Regulation (EU) No. 342/2014 in conjunction with article 49 (1) CRR and Circular 04/2018 from BaFin.

DZ BANK was classified as a financial conglomerate by way of a decision issued by BaFin on December 2, 2005; DZ BANK acts as the financial conglomerate's parent company.

The financial conglomerate coverage ratio is the ratio between the total of own funds in the financial conglomerate and the total of solvency requirements for the conglomerate. The resulting ratio must be at least 100 percent.

Financial conglomerate solvency is reported to the supervisory authority annually and is based on the requirements in Circular 04/2018 from BaFin on financial conglomerate solvency.

The solvency ratios as at December 31, 2021 were finalized in the first half of 2022. On the basis of a provisional calculation, the DZ BANK financial conglomerate's eligible own funds as at December 31, 2022 amounted to €36,021 million (December 31, 2021 based on the final calculation: €36,901 million). On the other side of the ratio, the solvency requirement based on a provisional calculation was €23,679 million (December 31, 2021 based on the final calculation: €24,470 million). This gives a coverage ratio, based on a provisional calculation, of 152.12 percent (December 31, 2021 based on the final calculation: 150.80 percent), which is significantly in excess of the regulatory minimum requirement of 100 percent. The increase in the coverage ratio calculated for the DZ BANK financial conglomerate was primarily due to the decrease in the solvency requirements.

FIG. 21 – EU INS2 – FINANCIAL CONGLOMERATES: INFORMATION ON CAPITAL REQUIREMENTS AND CAPITAL ADEQUACY RATIO as at December 31, 2022
(Article 438 letter g CRR)

		a	a
€ million		**Dec. 31, 2022**	**Dec. 31, 2021**
1	Supplementary capital requirements of the financial conglomerate (amount)	12,342	12,430
2	Capital adequacy ratio of the financial conglomerate (%)[1]	152.12	150.80

1 Coverage ratio calculated for the DZ BANK financial conglomerate.

6 Credit risk

(Articles 435, 442, 444, 452, and 453 CRR)

6.1 Credit risk management objectives and policies

Table EU CRA – General qualitative information about credit risk
(Article 435 CRR)

6.1.1 Business background and risk strategy

(Article 435 (1) letter a CRR)

Credit risk is defined as the risk of losses arising from the default of counterparties (borrowers, issuers, other counterparties) or from the migration of the credit ratings of these counterparties, or of losses in connection with the recovery of loans, advances, receivables, or collateral.

Credit risk may arise in traditional lending business and also in trading activities. **Traditional lending business** is for the most part commercial lending, including financial guarantee contracts and loan commitments. In the context of credit risk management, trading activities refer to securities business in the banking book and trading book, money market business, transactions involving tradable loans and advances (such as promissory notes), currency transactions, transactions involving derivatives, and transactions involving commodities (such as precious metals).

In **traditional lending business**, credit risk arises mainly in the form of default risk and migration risk. In this context, default risk refers to the risk that a customer may be unable to settle receivables arising from loans or advances made to the customer (including lease receivables) or make overdue payments. It also includes risks arising from contingent liabilities (such as issued guarantees and indemnities). The calculation of the exposure encompasses loan facilities promised to third parties and any existing overdrawn accounts in addition to loans that have already been drawn down. Migration risk is a sub-risk within traditional credit risk and reflects changes in the fair value of types of exposure subject to credit risk caused by a change in the rating for a borrower (rating migration).

Credit risk in connection with **trading activities** arises in the form of default risk, which can be subdivided into issuer risk, replacement risk, and settlement risk, depending on the type of transaction involved.

Issuer risk is the risk of incurring losses from the default of issuers of tradable debt or equity instruments (such as bonds, shares, profit-participation certificates), losses from a default in connection with the underlying instrument in derivatives (for example, credit or equity derivatives), or losses from a default in connection with fund components.

Replacement risk on derivatives is the risk of a counterparty defaulting during the term of a trading transaction.

Transaction processing risk is a default risk subcategory of replacement risk. It is factored into the exposure calculation for replacement risk. Transaction processing risk arises in connection with both delivery-versus-payment (DVP) settlement and unilateral payments in a trading transaction. It arises when the counterparty in a trading transaction cannot perform its contractual obligation.

Settlement risk arises when there are two mutually conditional payments and there is no guarantee that when the outgoing payment is made the incoming payment will be received. Settlement risk is the risk of a loss if counterparties do not meet their obligations, counter-performance already having taken place.

Recovery risk forms part of credit risk. It cannot be determined as an exposure amount but increases the risk capital requirement for traditional credit risk, issuer risk, and replacement risk. Recovery risk results from uncertainty regarding the recovery rate for existing collateral and uncertainty regarding the recovery rate for unsecured receivables (or partial receivables).

Country risk is also included within credit risk. Country risk in the narrower sense of the term refers to conversion, transfer, payment prohibition, or moratorium risk. It is the risk that a foreign government may impose restrictions preventing a debtor in the country concerned from transferring funds to a foreign creditor. In the broader sense of the term, country risk refers to sovereign risk (the risk arising from exposure to a government itself) or the risk that the quality of the overall exposure in a country may be impaired as a result of country-specific events (country-related borrower risk). In this case, it is not viewed as a separate risk type but as a component of credit risk and is thus recorded within traditional credit risk, issuer risk, and replacement risk.

The DZ BANK Group is exposed to considerable credit risk in the Bank sector. The lending business is one of the most important core activities of the entities in the Bank sector. In its role as the central institution, DZ BANK covers a **broad range of lending business**, either in partnership with the local cooperative banks or in direct business, and provides its customers with financing solutions. Its customers include the local cooperative banks themselves, corporate customers, retail customers, the public sector, international companies, and banks and institutions both in Germany and abroad.

Default risk from traditional lending business arises primarily at DZ BANK, BSH, and DZ HYP. The risk results from the specific transactions in each management unit and therefore has varying characteristics in terms of diversification and size in relation to the volume of business.

Default risk relating to trading transactions arises from issuer risk, particularly in connection with the trading activities and investment business of DZ BANK and DZ HYP. Replacement risk arises for the most part at DZ BANK.

The entities in the Bank sector pursue a strictly decentralized business policy aimed at promoting the cooperative banks and are bound by the core strategic guiding principle of a '**network-oriented central institution and financial services group'**. The business and risk policy for the credit-risk-bearing core businesses in the group is formulated on the basis of risk-bearing capacity. The **credit risk strategy** therefore forms the basis for credit risk management and reporting across the whole group and ensures that there is a standard approach to credit risk within the group. It takes into account the business models of each of the management units.

The management units aim to ensure that their credit portfolios always have a **sound credit quality and risk structure**. In the future, the portfolios will continue to be characterized by a high degree of diversification.

6.1.2 Organization, responsibility, and reporting

(Article 435 (1) letters b and c CRR)

Responsibilities in the lending process have been laid down and are documented in a written set of procedural rules. These responsibilities cover loan applications, approvals, and termination, including periodic credit control with regular analysis of ratings. Decision-making authority levels are specified by the relevant **rules** based on the risk content of lending transactions.

Established **reporting and monitoring processes** help to provide decision-makers with information about changes in the risk structure of credit portfolios and form the basis for managing credit risk.

The **credit risk report** keeps the Board of Managing Directors, the Group Risk and Finance Committee, and the Supervisory Board's Risk Committee informed of the economic capital required to cover credit risk. In addition to providing management with recommendations for action, internal reporting also includes an in-depth analysis of the portfolio structure in regard to risk concentrations based on key risk characteristics such as credit rating class, industry, country group, and the lending volume to single borrowers. In addition, the report includes details on specific exposures. In the context of the risk limit, the credit value-at-risk is also included in the credit risk report.

6.1.3 Risk management

(Article 435 (1) letters b, c, and d CRR)

Credit-portfolio management

Internal credit-portfolio models operated on a decentralized basis in the main management units are used together with value-at-risk methods to quantify unexpected losses from lending and trading business. The credit value-at-risk reduced by the expected loss is referred to as the risk capital requirement for transactions subject to credit risk. The risk capital requirement quantifies the risk of unexpected losses if default or migration events were to materialize.

Expected loss is calculated by multiplying the exposure at default (EAD) by the loss given default (LGD) and by the probability of default (PD). Exposure at default equates to the expected outstanding loan or receivable or the potential economic loss in respect of a counterparty if the counterparty defaults, without taking into account any collateral. Loss given default refers to the expected percentage loss on default of a borrower, whereby the loss is reduced by any proceeds anticipated from the recovery of collateral.

Probability of default is the probability, calculated on the basis of historical data, that a borrower will not be able to meet his or her payment obligations within a particular, future period. For the purposes of credit-portfolio management in the Bank sector, this period is one year. The probability of default reflects the borrower's current rating and, in individual cases, also takes into account business-specific factors.

When determining credit value-at-risk, recovery risk is taken into account as the amount by which the actual loss deviates from the expected recovery rate or – in the case of transactions already in default – from the specific loan loss allowances. Existing netting agreements are included in the measurement of trading exposures subject to default risk.

For the purposes of managing the credit portfolio, the credit value-at-risk and the decentralized capital buffer requirement are restricted by the credit risk limit. A traffic light system is used to monitor Bank sector management units' compliance with the limits specified for credit risk.

For **internal management purposes**, DZ BANK uses further rating systems to assess SMEs (German Mittelstand), countries, asset finance, acquisition financing, agricultural businesses, public-sector entities, not-for-profit organizations, foreign SMEs, and insurance companies.

Most of the other entities in the Bank sector use the DZ BANK rating systems for banks, countries, and major corporate customers. Rating systems for specific business segments are also used by individual subsidiaries.

Use and characteristics of the rating systems

The generation of internal credit ratings for the counterparties of entities in the Bank sector helps to provide a solid basis for lending decisions in the management of transactions, in that the expected losses from defaults in the lending business are then factored into pricing. In addition, internal ratings are used to incorporate the credit quality of the counterparties when calculating unexpected losses in the credit portfolio.

The **VR rating system** used as standard throughout the cooperative financial network aims to ensure that all the entities in the network apply a sophisticated uniform methodology producing ratings that are comparable.

DZ BANK primarily uses rating systems in its credit risk management system to assess large and medium-sized companies, major corporate customers, banks, investment funds, and project finance (slotting approach). The internal assessment approach is also used to evaluate the liquidity lines and credit enhancements made available by DZ BANK to programs for the issuance of asset-backed commercial paper (ABCP). These rating systems have been approved by the competent supervisory authority for the purposes of calculating regulatory capital using the **foundation IRB approach** or the **slotting approach**.

Development and expansion of rating systems

All internal rating systems and those approved by the banking supervisor for solvency reporting were validated in the reporting year. The regulatory review of the new rating system for major corporations was completed in 2022. The rating system is likely to be implemented in 2023.

DZ BANK credit rating master scale

The credit rating master scale serves as a groupwide rating benchmark with which to standardize the different rating systems used by the entities in the Bank sector as a result of differences in their business priorities. It thereby provides all management units with a uniform view of counterparties' credit ratings.

Fig. 22 shows DZ BANK's credit rating master scale and matches the internal credit ratings to the ratings used by Moody's, Standard & Poor's, and Fitch Ratings. Some internal ratings cannot be matched with a particular external rating because of the greater degree of refinement in the credit rating master scale. The ratings for securitization exposures are matched to various different external ratings depending on the asset class and region.

In DZ BANK's master scale, the default bands remain unchanged to ensure comparability over the course of time, whereas some fluctuation in default rates can be seen in external ratings. Therefore, it is not possible to map the internal ratings directly to the ratings used by the rating agencies. Consequently, the chart can only be used as a starting point for comparison between internal and external credit ratings.

FIG. 22 – BANK SECTOR: DZ BANK'S VR CREDIT RATING MASTER SCALE AND EXTERNAL CREDIT RATINGS

Internal rating class	Average default probability	External rating classes: Moody's	External rating classes: Standard & Poor's	External rating classes: Fitch	Rating category
1A	0.01%	Aaa to Aa2	AAA to AA	AAA to AA	Investment grade
1B	0.02%	Aa3	AA-	AA-	
1C	0.03%				
1D	0.04%	A1	A+	A+	
1E	0.05%				
2A	0.07%	A2	A	A	
2B	0.10%	A3	A-	A-	
2C	0.15%	Baa1	BBB+	BBB+	
2D	0.23%	Baa2	BBB	BBB	
2E	0.35%				
3A	0.50%	Baa3	BBB-	BBB-	
3B	0.75%	Ba1	BB+	BB+	Non-investment grade
3C	1.10%	Ba2	BB	BB	
3D	1.70%				
3E	2.60%	Ba3	BB-	BB-	
4A	4.00%	B1	B+	B+	
4B	6.00%	B2	B	B	
4C	9.00%	B3	B-	B-	
4D	13.50%				
4E	30.00%	Caa1 or lower	CCC+ or lower	CCC+ or lower	
5A	DPD default				Default
5B	Specific loan loss allowance / internal neutralization of interest / rating-related sale with significant loss / further bank-internal criteria				
5C	Distressed restructuring				
5D	Insolvency				
5E	Direct impairment / workout				
NR	Not rated				

DZ BANK rating desk

The VR rating systems for banks and countries are also available to DZ BANK subsidiaries and the cooperative banks. Users can enter into a master agreement to access the ratings via an IT application (Rating Desk), which is available throughout the cooperative financial network, in return for the payment of a fee. Any accessed ratings are first validated by the entities in the Bank sector or the cooperative banks before they are included in the user's credit procedures.

Identifying risk concentrations

One of the Bank sector's key concerns in the management of credit risk is to avoid undesirable concentrations and correlations of risks in the credit portfolio. To this end, it has established credit risk strategies, policies, and principles that must be applied in the various areas of business. The main structural elements are managed on this basis with the aim of ensuring that the credit portfolio is appropriately diversified. The structural elements include specifications for rating-related maximum exposures, strategic borrower limits, restriction of areas of business to specified countries or regions, maturity limits, specific requirements for certain operating segments and industries, and requirements relating to collateral, loan agreement clauses, and key credit-risk-related figures.

Risk concentrations in credit and collateral portfolios

In managing the traditional lending business and its trading business, DZ BANK takes into account the correlation between collateral and the borrower pledging the collateral or between the collateral and the counterparty whose replacement risk the collateral is intended to mitigate. If there is a significant positive correlation between the collateral and the borrower or the counterparty pledging the collateral, the collateral is disregarded or accorded a reduced value as collateral. This situation arises, for example, where a protection provider, garnishee, or issuer forms a group of connected clients or a similar economic entity with the borrower or counterparty.

Management and monitoring of exposures subject to heightened risk

Early identification of risk is a key component of the management and monitoring of traditional lending business. The system for identifying risk at an early stage is designed to detect emerging risks at the earliest opportunity and return the affected lending exposures to acceptable levels of risk quality. Another objective is to minimize losses from loan defaults.

In order to identify risk at an early stage, criteria are defined as early-warning indicators that should show when exposures must become subject to special, closer monitoring (intensified loan management) and when lending exposures must be transferred to the specialist units responsible for loan restructuring and workout.

The following lists are maintained to closely monitor lending exposures that are subject to intensified management and lending exposures that are in default:

– The **yellow list** for exposures with latent risk
– The **watch list** for exposures with heightened risk
– The **default list** for exposures with acute risk (exposures that are classified as in default and thus non-performing)

Borrowers are classified as in default and thus **non-performing** either if a material portion of their overall obligation under the loan agreement is past due by more than 90 consecutive calendar days or if it is unlikely that they will meet their payment obligations under the loan agreement in full without the management unit in the Bank sector that granted the loan having recourse to actions such as the recovery of any available collateral. This corresponds to the definition of default specified by the CRR. Borrowers in default are assigned a rating of between 5A and 5E on the VR credit rating master scale.

Non-performing loan exposures are also referred to by the abbreviation NPL. They are managed using the following key figures:

– **Coverage ratio** (specific loan loss allowances plus collateral as a proportion of the volume of non-performing loans)
– **NPL ratio** (volume of non-performing loans as a proportion of total lending volume)

Workout units become involved at an earlier stage of identified difficulties. By providing intensified loan management for critical exposures and applying problem-solving strategies, these special units aim to establish the basis for securing and optimizing exposures with heightened risk.

Exposures with heightened risk are generally reviewed, updated, and reported on a quarterly basis. The process is also carried out at shorter intervals if required. This process is supported by IT systems. Prompt internal reporting focused on target groups is a key component of this approach.

6.1.4 Risk measuring systems for credit risk

(Article 435 (1) letter c CRR)

Measuring exposure in traditional lending business

Individual lending exposures are managed on the basis of an analysis of gross lending exposure. The period taken into account in this case is equivalent to the monitoring cycle of one year. Together with risk-related credit-portfolio management, volume-oriented credit risk management is one of the components in the management of risk concentrations in the lending business.

In traditional lending business, the credit exposure or lending volume is generally the same as the nominal value of the total loan book and reflects the maximum volume at risk of default. The credit exposure is a gross value because risk-bearing financial instruments are measured before the application of any credit risk mitigation and before the recognition of any loss allowances. The maximum credit exposure comprises the total lines of credit committed to third parties, or in the case of limit overruns, the higher amounts already drawn.

In building society operations, nominal amounts are used as a basis for measuring the gross lending volume. In addition, loans and advances to customers in building society operations are reduced by the associated deposits.

Limit system for managing exposures in traditional lending business

Limits are set in the relevant entities in the Bank sector for individual borrowers and groups of connected customers. Counterparties are also managed centrally at the level of the Bank sector, depending on the limit level and credit rating.

As a prerequisite for prompt monitoring of limits, suitable **early-warning processes** have been established in the management units that are of material significance for the Bank sector's credit risk. In this context, financial covenants are often incorporated into loan agreements to act as early-warning indicators for changes in credit standing and as a tool for the proactive risk management of lending exposures.

In addition, processes have been set up in the Bank sector to handle instances in which limits are **exceeded**. Such excess exposures must be approved by the relevant level of authority in the management units concerned and in accordance with applicable internal requirements, and must be reduced if necessary.

Country exposure in the traditional lending business is managed by setting **country limits** for industrialized countries and emerging markets at the Bank sector level.

Measuring credit exposure in trading transactions

Issuer risk, replacement risk, and settlement risk are exposure-based measurements of the potential loss in trading transactions. These are determined without taking into account the likelihood of a default. In order to determine the credit exposure, securities in the banking book and trading book are predominantly measured at fair value, while derivatives are measured at fair value and, in respect of settlement risk, at the cash-flow-based accepted value.

The fair value of a securities exposure is used to determine the **issuer risk**. Risks relating to the underlying instruments in derivative transactions are also included in issuer risk.

At the level of the Bank sector, **replacement risk** is generally determined on the basis of fair value, taking into account appropriate add-ons. At DZ BANK, which is of particular significance as far as replacement risk is concerned, these add-ons are determined primarily according to each individual transaction as part of a portfolio simulation. The portfolio simulation models future exposures, taking into account a large number of risk factors. The add-ons for the remaining derivatives not included in the portfolio simulation are determined on the basis of a product-specific allocation, which also takes into account specific risk factors and residual maturities. Transaction processing risk is additionally factored into the exposure calculation for replacement risk. This risk is largely determined as the net present value of the reciprocally required performance.

With regard to exchange-traded derivatives, the replacement risk vis-à-vis the customer in customer brokerage business consists of the actual collateral exchanged (the variation margin for the daily settlement of profits and losses, and the initial margin as the collateral to be provided in advance to cover the loss risk), the fair value, and additional collateral requirements. To calculate the replacement risk vis-à-vis stock exchanges, additional potential for changes in value or add-ons for individual transactions are also taken into consideration. Where legally enforceable, netting agreements and collateral agreements are used at counterparty level for all derivatives in order to reduce exposure (see also section 6.9.1, paragraph 'Collateral management'). In the case of repos and securities lending transactions, haircuts are applied instead of add-ons. Unsecured money market transactions are measured at fair value.

As regards **settlement risk**, the risk amount is the expected payment due. Settlement risk is recognized for the specified settlement period. It takes into account the amount and timing of outstanding cash flows for the purposes of managing the risk associated with mutual settlement at some point in the future. These future cash flows are already factored into the replacement risk through the fair value measurement and are therefore included in the risk capital requirement. As a result, settlement risk does not need to be covered with risk capital in addition to that for the other types of credit risk related to trading activities.

Limit system for managing trading exposure

DZ BANK has established an exposure-oriented **limit system** related to credit ratings to limit the default risk arising from trading business. Replacement risk is managed via a structure of limits broken down into maturity bands. Unsecured money market transactions are subject to separate limits. The transaction processing risk forming part of the replacement risk is included in the shortest maturity band. A daily limit is set in order to manage settlement risk. A specific limit for each issuer or, in certain circumstances, a general limit is determined as the basis for managing issuer risk. The specific limit can also be broken down into seniority bands; in the case of asset-backed securities, the specific limit can be broken down into rating bands. Issuer risk relating to cover assets is subject to separate limits, as are settlement risk and replacement risk attaching to cover assets. Since mid-2022, issuer risk in connection with the trading book and issuer risk in connection with the banking book have been subject to separate limits. The material subsidiaries have their own comparable limit systems.

The standardized methodology for measuring and monitoring trading exposure at DZ BANK (**post-transaction control**) is included in an IT-supported limit monitoring system, to which all relevant trading systems are directly or indirectly connected. A second IT system is used solely for most of the **pre-transaction control**. This functionality is currently being migrated to the system used for post-transaction control. Furthermore, the trading exposure in the Bank sector is managed on a decentralized basis at management unit level.

As in the traditional lending business, appropriate processes have also been established for the trading business to provide **early warnings and notification of limit overruns**. The member of the Board of Managing Directors responsible for risk monitoring is sent a daily list of significant exceeded trading limits. A monthly report is prepared covering the utilization of replacement and issuer risk in connection with trading activities.

Country exposure in the trading business is managed in the same way as in the traditional lending business by setting **limits for countries** at the Bank sector level.

6.2 Additional disclosure related to the credit quality of assets

Table EU CRB – qualitative disclosures, letters a to d
(Article 442 letters a and b CRR)

Definitions for 'past due' and 'impaired' exposures

A transaction has to be classified as a non-performing exposure if it is **impaired** according to IFRS 9 or if a default pursuant to article 178 CRR has arisen. Under IFRS 9, impaired exposures are those that are classed as credit-impaired (stage 3; see explanation below).

The entities in the Bank sector classify a loan as **non-performing** if it has been rated between 5A and 5E on the VR credit rating master scale (Fig. 22). This corresponds to the definition of default specified by the CRR. Non-performing loans are also referred to by the abbreviation NPL.

An exposure is classified as **past due** if interest payments, the repayment of principal, or any fees owed were not paid at the time that they became due.

Volume of past due receivables (by more than 90 days) that are not considered impaired

The **volume of past due receivables** (by more than 90 days) that were not considered impaired as at December 31, 2022 amounted to €5.2 million and were attributable to one group entity (December 31, 2021: €5.4 million). Although this group entity implemented the materiality threshold applicable to the groupwide definition of default for its definition of default, classification as impaired, and classification as an NPE, it uses a count of the number of days past due without a materiality threshold to allocate receivables to clusters based on the number of days past due in accordance with FINREP.

Methods for determining general and specific credit risk adjustments

All loss allowances pursuant to IFRS 9 are classified as specific credit risk adjustments in accordance with the CRR. There are no general credit risk adjustments in the DZ BANK banking group.

The rules for recognizing loss allowances are based on the calculation of expected losses in the lending business, on investments, and on other assets. The impairment rules are applied only to those financial assets that are not measured at fair value through profit or loss. These are:

– financial assets measured at amortized cost; and
– debt instruments held as financial assets measured at fair value through other comprehensive income.

The impairment rules are also applied to:

– financial guarantee contracts and loan commitments that fall within the scope of IFRS 9 and are not recognized at fair value through profit or loss;
– lease receivables; and
– trade receivables and contract assets pursuant to IFRS 15.

In accordance with IFRS 9, the three-stage approach is used, additionally taking POCI assets (purchased or originated credit-impaired assets) into account, to determine the expected losses:

– Stage 1: For financial assets whose credit risk has not increased significantly since initial recognition that were not impaired upon initial recognition, the 12-month credit loss is recognized. Interest is recognized on the basis of the gross carrying amount.

– Stage 2: For financial assets whose credit risk has increased significantly since initial recognition, the loss allowances are determined in the amount of the assets' lifetime expected credit losses. Interest is recognized on the basis of the gross carrying amount.
– Stage 3: Financial assets are classified as impaired and thus assigned to stage 3 if they are deemed to be in default pursuant to article 178 CRR as operationalized in the DZ BANK Group's policy on the definition of default. Because the indicators and events deemed to be stage 3 criteria under IFRS 9 cover the same scope and, at the same time, lead to default pursuant to article 178 CRR, there is a correlation between these two classifications. Therefore, if the financial assets are in default, they are also classified as impaired and assigned to stage 3. Here too, loss allowances are recognized in the amount of the lifetime expected credit losses. Interest income is calculated on the amortized cost after loss allowances using the effective interest method.
– POCI assets: Financial assets that are already deemed impaired upon initial recognition are not assigned to the 3-stage model and are reported separately. Credit-impaired financial assets are initially recognized at fair value rather than at their gross carrying amount. Consequently, interest is recognized for these assets using a risk-adjusted effective interest rate.

The review of whether the credit risk of financial assets, financial guarantee contracts, and loan commitments has increased significantly since initial recognition is carried out on an ongoing basis. The assessment is conducted both for individual financial assets and for portfolios of assets using quantitative and qualitative analysis. As a rule, quantitative analysis looks at the expected credit risk over the entire residual life of the financial instruments in question. Macroeconomic information is also taken into account in the form of shift factors. The model-driven default probability profiles used in economic and regulatory risk management are adjusted on the basis of these shift factors. For the quantitative transfer criterion, the credit risk as at the balance sheet date for the residual life is compared with the assets' credit risk over the same maturity period estimated at the time of initial recognition. The thresholds that indicate a significant increase in credit risk are determined for each portfolio separately as the ratio of the latest changes in the lifetime probability of default (lifetime PD) to the portfolio's past lifetime PD. Internal risk measurement systems, external credit ratings, and risk forecasts are also used to assess the credit risk of financial assets. The maximum value for these transfer thresholds is 200 percent.

There are also 3 qualitative transfer criteria: assets for which forbearance measures have been agreed, assets where the counterparty has been put on the watchlist for the early identification of risk, and assets where payments are more than 30 days past due. These also have significantly increased credit risk and are assigned to stage 2, unless they need to be assigned to stage 3. Payments being more than 30 days past due is deemed a backstop criterion because, as a rule, the other transfer criteria mean that financial assets are allocated to stage 2 well before payments become more than 30 days past due.

Assets with low credit risk and/or an investment-grade credit rating are also monitored for increases in credit risk and for credit rating changes. If the quantitative transfer threshold is exceeded, however, the low credit risk exemption means that these assets are transferred to stage 2 only if a qualitative transfer criterion applies or if a non-investment-grade credit rating is awarded. The low credit risk exemption applies to securities, loans and advances, loan commitments, and financial guarantee contracts.

If, on the balance sheet date, it is found that there is no longer a significant increase in credit risk compared with previous balance sheet dates, the financial assets in question are transferred back to stage 1 and the loss allowances are brought back down to the level of the 12-month expected credit loss. If a financial instrument in stage 3 recovers, the difference between the interest income determined for the period of credit impairment on the basis of amortized cost and the actual interest income recognized in respect of the financial instrument for the period concerned is reported as a reversal of an impairment loss or a reversal of loss allowances. A transfer back from stage 3 is carried out if there are no longer indicators of credit impairment. At the same time, the regulatory default status ceases to apply and specified cure periods are taken into account.

Expected losses are calculated as the probability-weighted present value of the expected outstanding payments. In the case of transactions assigned to stage 1 of the impairment model, the analysis period is the next 12 months. For stage 2 transactions, the residual life is used. The expected losses are discounted with the original effective interest rate for the transaction and variable-rate assets with the current interest rate. The calculation uses the regulatory model (probability of default, loss given default, and expected loan amount at the time of default), with adjustments to satisfy the requirements of IFRS 9. The estimated parameters incorporate both historical and forward-looking default information. This is applied when loss allowances are determined, in the form of shifts in the default probabilities calculated using statistical methods (known as shift factors). Depending on the portfolio, the calculation of the expected loss for specific exposures in stage 3 also uses this type of parameter-based approach or draws on individual expert appraisals of the achievable cash flows and probability-weighted scenarios at individual transaction level.

For the purpose of calculating loss allowances for portfolios, the portfolios are grouped according to shared credit risk characteristics, e.g. credit rating, date of origination, residual life, industry and origin of the borrower, and type of asset.

Directly recognized impairment losses reduce the carrying amounts of assets directly. Unlike loss allowances, which are estimates, directly recognized impairment losses are specified in an exact amount if this is justified because the receivable is not collectible (e.g. as a result of the notification of an insolvency ratio). Impairment losses can be recognized directly by writing down the asset value and/or by using existing loss allowances. As a rule, asset values are written down directly after all recovery and enforcement measures have been completed. Directly recognized impairment losses are also applied to insignificant amounts.

For various input parameters in the loss allowance model, it is assumed that developments observable in the past are no longer fully representative of future developments. In the retail consumer finance business, post-model adjustments were therefore carried out that had a total effect of €105 million as at December 31, 2021. The post-model adjustments were adapted to the changed circumstances as at the end of the first half of 2022. As the unique circumstances created by the COVID-19 pandemic have largely returned to normal and thus the associated uncertainty for the consumer finance business has dissipated, the related post-model adjustments were fully reversed in 2022. At the end of 2022, a new post-model adjustment was recognized owing to a procedural change to the replacement process in Germany. As a result of this change, loans are increasingly being issued in parallel (instead of internal replacement of existing loans and expansion of new loan volumes). This procedural change is distorting the lifetime risk measurement. The post-model adjustments in existence as at December 31, 2022 amounted to a total of €67 million.

The institution's own definition of a restructured exposure

Distressed restructuring, which, according to article 178 (3) letter d CRR, is an indication that a liability is unlikely to be settled, is defined as follows at DZ BANK: a forbearance measure pursuant to Annex V of Implementing Regulation (EU) No. 680/2014 that results in a present value loss of more than 1 percent or where settlement of the liability is considered unlikely. Certain features of the forbearance measure carried out, such as a large final installment or a long interest-only period, are regarded as particularly critical.

6.3 Breakdown of loans and advances and of debt securities by residual maturity

(Article 442 letter g CRR)

Fig. 23 contains details of the maturities of exposures in the loans and advances category and debt securities category.

FIG. 23 – EU CR1-A – MATURITY OF EXPOSURES AS AT DECEMBER 31, 2022
(Article 442 letter g CRR)

		a	b	c	d	e	f
		Net exposure value					
€ million		On demand	<= 1 year	> 1 year <= 5 years	> 5 years	No stated maturity	Total
1	Loans and advances	24,709	44,955	78,343	182,373	5,964	336,344
2	Debt securities	18	6,527	20,993	18,713	552	46,804
3	**Total as at Dec. 31, 2022**	**24,727**	**51,482**	**99,337**	**201,086**	**6,516**	**383,148**
3	Total as at Jun. 30, 2022	28,897	55,292	96,865	205,537	7,597	394,189

The net exposure value totaled €383,148 million as at the reporting date. The total reduction compared with June 30, 2022 was €11,041 million, with the largest percentage decreases accounted for by exposures that can be terminated on demand (down by €4,170 million or 14.43 percent) and by exposures with no stated maturity (down by €1,081 million or 14.23 percent).

6.4 Non-performing and forborne exposures

(Article 442 letters c, d, e, and f CRR)

6.4.1 Past-due and non-performing exposures by sector

(Article 442 sentence 1 letters c and e CRR)

Fig. 24 shows **exposures** in default and not in default, broken down by **sector**. Sectors of little significance to the DZ BANK banking group are aggregated in the other services row.

FIG. 24 – EU CQ5 – CREDIT QUALITY OF LOANS AND ADVANCES TO NON-FINANCIAL CORPORATIONS BY INDUSTRY
(Article 442 letters c and e CRR)

		a	b	c	d	e	f
		Gross carrying amount					
			of which: non-performing		of which: loans and advances subject to impairment	Accumulated impairment	Accumulated negative changes in fair value due to credit risk on non-performing exposures
€ million				of which: defaulted			
010	Agriculture, forestry, and fishing	689		17	689	-13	-
020	Mining and quarrying	520		11	520	-15	-
030	Manufacturing	9,322	6	650	9,293	-348	-
040	Electricity, gas, steam, and air conditioning supply	7,952	50	50	7,952	-83	-
050	Water supply	642		14	642	-4	-
060	Construction	2,523		69	2,521	-54	-
070	Wholesale and retail trade	5,943	1	196	5,925	-140	-3
080	Transport and storage	3,306	1	153	3,306	-101	-
090	Accommodation and food service activities	407	23	23	403	-23	-
100	Information and communication	1,370		22	1,370	-27	-
110	Financial and insurance activities	29	-	-	29	0	-
120	Real estate activities	39,447		77	39,432	-164	-
130	Professional, scientific, and technical activities	1,932	25	25	1,845	-19	-2
140	Administrative and support service activities	2,709	19	19	2,709	-28	-

€ million		a	b	c	d	e	f
		Gross carrying amount				Accumulated impairment	Accumulated negative changes in fair value due to credit risk on non-performing exposures
			of which: non-performing		of which: loans and advances subject to impairment		
				of which: defaulted			
150	Public administration and defense; compulsory social security	3	-	-	3	0	-
160	Education	76		1	76	-1	-
170	Human health services and social work activities	796	26	26	796	-7	-
180	Arts, entertainment, and recreation	254	3	3	254	-3	-
190	Other services	6,474	1	109	6,455	-89	0
200	**Total as at Dec. 31, 2022**	**84,394**	**1,4**	**1,465**	**84,219**	**-1,118**	**-6**
200	Total as at Jun. 30, 2022	84,751	1,4	1,451	84,530	-1,030	-6

Loans and advances to non-financial corporations were concentrated in real estate activities, which accounted for €39,447 million or 46.74 percent of the total. The next biggest groups of such loans and advances were the following sectors: manufacturing (€9,322 million or 11.05 percent), electricity, gas, steam, and air conditioning supply (€7,952 million or 9.42 percent), and wholesale and retail trade (€5,943 million or 7.04 percent).

The proportion of the gross carrying amount classified as non-performing was 1.74 percent or €1,465 million. The non-performing exposures were predominantly concentrated in the following sectors: manufacturing (€650 million or 44.38 percent), transport and storage (€153 million or 10.45 percent), and wholesale and retail trade (€196 million or 13.36 percent). Of the total non-performing exposures, €1,465 million or 100.00 percent had already defaulted.

6.4.2 Quality of non-performing exposures by geography

(Article 442 letters c and e CRR)

Fig. 25 provides an overview of the quality of non-performing exposures, broken down by the countries that are significant to the DZ BANK banking group. The countries that we consider significant are Germany and countries whose on-balance-sheet and off-balance-sheet exposures together make up at least 5 percent of total foreign exposures. All other countries and supranational organizations are included under other countries. The other countries are listed in section 17 of this report.

FIG. 25 – EU CQ4 – QUALITY OF NON-PERFORMING EXPOSURES BY GEOGRAPHY AS AT DECEMBER 31, 2022
(Article 442 letters c and e CRR)

		a	b	c	d	e	f	g
		Gross carrying amount/nominal amount				Accumulated impairment	Provisions for off-balance-sheet liabilities arising from commitments and financial guarantees given	Accumulated negative changes in fair value due to credit risk on non-performing exposures
			of which: non-performing		of which: subject to impairment			
€ million				of which: defaulted				
010	**On-balance-sheet exposures**	**464,458**	**3,008**	**3,008**	**458,080**	**-2,117**		**-7**
020	Germany	385,497	2,116	2,116	381,762	-1,542		-6
030	Luxembourg	15,651	51	51	15,565	-75		-
040	USA	7,367	183	183	7,171	-95		-1
050	France	6,329	2	2	6,261	-11		-
060-1	Switzerland	6,220	2	2	6,049	-3		-
060-2	United Kingdom	4,607	0	0	4,543	-2		-
060-3	Austria	4,385	88	88	4,129	-96		-
060-4	Netherlands	3,872	1	1	3,836	-6		-
070	Other countries	30,528	565	565	28,764	-287		0
080	**Off-balance-sheet exposures**	**85,453**	**243**	**243**			**236**	
090	Germany	70,664	196	196			163	
100	Luxembourg	779	-	-			1	
110	USA	3,775	1	1			3	
120	France	245	0	0			0	
130-1	Switzerland	1,479	-	-			1	
130-2	United Kingdom	772	-	-			2	
130-3	Austria	1,526	0	0			1	
130-4	Netherlands	975	-	-			1	
140	Other countries	5,239	47	47			63	
150	**Total as at Dec. 31, 2022**	**549,911**	**3,251**	**3,251**	**458,080**	**-2,117**	**236**	**-7**
150	Total as at Jun. 30, 2022	561,721	3,235	3,235	468,183	-1,963	213	-7

As at the reporting date, the exposures were concentrated in Germany in an amount of €456,161 million, which equated to 82.95 percent of the total of €549,911 million. The next biggest groups of exposures were Luxembourg (€16,430 million or 2.99 percent) and the USA (€11,142 million or 2.03 percent). The proportion attributable to other countries was €35,767 million or 6.50 percent.

This geographical distribution of the exposures is more or less reflected in the breakdown of non-performing exposures. Based on the total non-performing exposures of €3,251 million, a sum of €2,312 million or 71.11 percent was accounted for by non-performing exposures in Germany. The next biggest share was attributable to other countries in an amount of €611 million or 18.81 percent.

Of the total non-performing exposures, €3,251 million or 100.00 percent had already defaulted. The bulk of these were attributable to Germany (€2,312 million or 71.11 percent) and other countries (€611 million or 18.81 percent).

Overall, 83.30 percent of the exposures were subject to impairment.

6.4.3 Changes in loss allowances for loans and advances

(Article 442 letter f CRR)

Supplementing the flow statement for credit risk adjustments in Fig. 42, Fig. 26 shows the balance of non-performing loans and advances in the form of a flow statement. Based on the scope of consolidation for regulatory purposes, the values disclosed correspond to the IFRS carrying amounts at the reporting date after deduction of impairment losses.

FIG. 26 – EU CR2 – CHANGES IN THE BALANCE OF NON-PERFORMING LOANS AND ADVANCES AS AT DECEMBER 31, 2022
(Article 442 letter f CRR)

€ million		a Gross carrying amount
010	**Original balance of non-performing loans and advances**	**3,045**
020	Inflows into non-performing portfolios	2,490
030	Outflows from non-performing portfolios	-2,617
040	Outflows due to write-offs	-356
050	Outflow due to other situations	-2,261
060	**Final balance of non-performing loans and advances**	**2,917**

The final balance of non-performing loans and advances stood at €2,917 million as at the reporting date (December 31, 2021: €3,045 million). This equates to a net decrease of €127 million compared with the previous reporting date.

The overall change was primarily due to the contraction of the non-performing portfolio. While inflows amounted to €2,490 million, a sum of €2,617 million was attributable to outflows, of which €2,261 million was accounted for by outflows due to other situations.

There were no material changes compared with the balance as at December 31, 2021.

6.4.4 Forbearance

(Article 442 letter c CRR)

Fig. 27 shows the gross carrying amount of the forborne exposures and the related accumulated impairment, provisions, accumulated change in fair value due to credit risk, and collateral and financial guarantees received based on the scope of consolidation for regulatory purposes in accordance with Part 1 Title II Chapter 2 CRR.

FIG. 27 – EU CQ1 – CREDIT QUALITY OF FORBORNE EXPOSURES AS AT DECEMBER 31, 2022
(Article 442 letter c CRR)

		a	b	c	d	e	f	g	h
		Gross carrying amount/nominal amount of exposures with forbearance measures				Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions		Collateral received and financial guarantees received on forborne exposures	
		Performing forborne	Non-performing forborne			On performing forborne exposures	On non-performing forborne exposures		of which: collateral and financial guarantees received on non-performing exposures with forbearance
€ million				of which: defaulted	of which: impaired				
005	Balances with central banks and other demand	-	-	-	-	-	-	-	-
010	Loans and advances	1,338	1,470	1,470	1,470	-51	-562	1,517	587
020	*Central banks*	-	-	-	-	-	-	-	-
030	*General governments*	-	-	-	-	-	-	-	-
040	*Credit institutions*	-	2	2	2	-	-2	-	-
050	*Other financial corporations*	34	146	146	146	-2	-84	37	36
060	*Non-financial corporations*	637	868	868	868	-35	-387	594	282
070	*Households*	666	455	455	455	-15	-89	886	269
080	Debt securities	-	0	0	-	-	-	-	-
090	Loan commitments given	365	62	62	62	-17	-21	14	7
100	**Total as at Dec. 31, 2022**	**1,702**	**1,532**	**1,532**	**1,532**	**-68**	**-583**	**1,531**	**594**
100	Total as at **Jun. 30, 2022**	1,878	1,641	1,641	1,641	-70	-629	1,673	651

The gross amount of the exposures with forbearance measures was €3,234 million as at December 31, 2022 (June 30, 2022: €3,519 million). Of this amount, €1,702 million was attributable to performing forborne exposures (June 30, 2022: €1,878 million) and €1,532 million to non-performing forborne exposures (June 30, 2022: €1,641 million).

As at December 31, 2022, the accumulated impairment stood at €650 million (June 30, 2022: €699 million), of which €583 million was attributable to non-performing forborne exposures (June 30, 2022: €629 million).

The majority of the accumulated impairment of the non-performing forborne exposures was attributable to non-financial corporations (€387 million or 66.37 percent), while €89 million (15.36 percent) was attributable to households and €84 million (14.40 percent) to other financial corporations.

As at December 31, 2022, the collateral and financial guarantees received on forborne exposures totaled €1,531 million (June 30, 2022: €1,673 million), of which €594 million (38.83 percent) was attributable to non-performing exposures with forbearance measures (June 30, 2022: €651 million or 38.87 percent).

There were no material changes compared with the amounts as at June 30, 2022.

6.4.5 Non-performing exposures

(Article 442 letters c and d CRR)

The gross carrying amount of the performing and non-performing exposures are disclosed for the companies consolidated for regulatory purposes in Fig. 28.

FIG. 28 – EU CQ3 – CREDIT QUALITY OF PERFORMING AND NON-PERFORMING EXPOSURES BY PAST DUE DAYS AS AT DECEMBER 31, 2022
(Article 442 letters c and d CRR)

		a	b	c	d	e	f	g	h	i	j	k	l
		Gross carrying amount/nominal amount											
		Performing exposures			Non-performing exposures								
			Not past due or past due ≤ 30 days	Past due > 30 days ≤ 90 days		Unlikely to pay that are not past due or are past due ≤ 90 days	Past due > 90 days ≤ 180 days	Past due > 180 days ≤ 1 year	Past due > 1 year ≤ 2 years	Past due > 2 years ≤ 5 years	Past due > 5 years ≤ 7 years	Past due > 7 years	of which: defaulted
€ million													
005	Balances with central banks and other demand deposits	102,838	102,838	-	-	-	-	-	-	-	-	-	-
010	Loans and advances	317,531	317,312	219	2,917	1,713	205	233	203	320	63	180	2,917
020	*Central banks*	2,266	2,266	-	-	-	-	-	-	-	-	-	-
030	*General governments*	15,549	15,549	-	0	0	-	-	-	-	-	-	0
040	*Credit institutions*	111,489	111,489	0	189	123	21	10	-	33	-	2	189
050	*Other financial corporations*	15,464	15,463	1	240	211	18	1	0	4	0	6	240
060	*Non-financial corporations*	82,929	82,863	66	1,465	904	68	80	84	163	29	138	1,465
070	*of which: SMEs*	12,937	12,916	22	123	45	12	14	22	26	2	3	123
080	*Households*	89,833	89,681	153	1,024	474	99	143	119	121	34	35	1,024
090	Debt securities	41,081	41,081	-	90	90	-	-	-	-	-	-	90
100	*Central banks*	777	777	-	-	-	-	-	-	-	-	-	-
110	*General governments*	12,185	12,185	-	12	12	-	-	-	-	-	-	12
120	*Credit institutions*	20,627	20,627	-	-	-	-	-	-	-	-	-	-
130	*Other financial corporations*	4,251	4,251	-	78	78	-	-	-	-	-	-	78
140	*Non-financial corporations*	3,241	3,241	-	0	0	-	-	-	-	-	-	0
150	Off-balance-sheet exposures	85,210			243								243
160	*Central banks*	-			-								-
170	*General governments*	663			-								-
180	*Credit institutions*	27,684			7								7
190	*Other financial corporations*	8,628			16								16
200	*Non-financial corporations*	39,291			189								189
210	*Households*	8,944			31								31
220	**Total as at Dec. 31, 2022**	**546,660**	**461,231**	**219**	**3,251**	**1,803**	**205**	**233**	**203**	**320**	**63**	**180**	**3,251**
220	Total as at Jun. 30, 2022	558,486	473,591	162	3,235	1,787	220	172	185	331	85	179	3,235

The gross amount of the performing and non-performing exposures was €549,911 million as at December 31, 2022 (June 30, 2022: €561,721 million). Of this amount, €546,660 million was attributable to performing exposures (June 30, 2022: €558,486 million) and €3,251 million to non-performing exposures (June 30, 2022: €3,235 million).

Of the non-performing exposures, the majority (€1,653 million or 50.85 percent) was attributable to non-financial corporations, while €1,055 million (32.46 percent) was attributable to households and €334 million (10.27 percent) to other financial corporations. In total, 55.46 percent of the non-performing exposures were past due by 90 days or fewer and 17.34 percent were past due by more than 2 years. Off-balance-sheet exposures are not included in the breakdown by past-due period. Compared with June 30, 2022, the volume of exposures past due by more than 180 days to 1 year had risen by 35.78 percent, the majority of which was attributable to households and non-financial corporations. By contrast, the volume of exposures past due by more than 5 years to 7 years in these two segments had fallen by 25.48 percent.

Overall, 100.00 percent of non-performing exposures were in default.

The DZ BANK banking group's gross NPL ratio was unchanged at 0.91 percent (June 30, 2022: 0.91 percent).

Fig. 29 shows the gross carrying amount of the performing and non-performing exposures and the related accumulated impairment, provisions, accumulated changes in fair value due to credit risk, accumulated partial write-offs, and collateral and financial guarantees received based on the scope of consolidation for regulatory purposes in accordance with Part 1 Title II Chapter 2 CRR.

FIG. 29 – EU CR1 – PERFORMING AND NON-PERFORMING EXPOSURES AND RELATED PROVISIONS
(Article 442 letters c and f CRR)

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
		Gross carrying amount/nominal amount						Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions								
		Performing exposures			Non-performing exposures			Performing exposures – accumulated impairment and provisions			Non-performing exposures – accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions				Collateral and financial guarantees received	
€ million			of which: stage 1	of which: stage 2		of which: stage 2	of which: stage 3		of which: stage 1	of which: stage 2		of which: stage 2	of which: stage 3	Accumulated partial write-off	On performing exposures	On non-performing exposures
005	Balances with central banks and other demand deposits	102,838	102,820	18	-	-	-	-3	-1	-2	-	-	-	-	0	-
010	Loans and advances	317,531	278,129	37,185	2,917	-	2,758	-816	-275	-541	-1,239	-	-1,215	-84	136,532	1,043
020	Central banks	2,266	2,266	0	-	-	-	0	0	-	-	-	-	-	-	-
030	General governments	15,549	14,820	112	0	-	0	-6	-2	-4	0	-	0	-	591	-
040	Credit institutions	111,489	109,992	157	189	-	189	-19	-17	-2	-32	-	-32	-	2,292	139
050	Other financial corporations	15,464	9,855	5,593	240	-	234	-30	-8	-22	-141	-	-141	-	7,943	48
060	Non-financial corporations	82,929	56,645	26,120	1,465	-	1,373	-383	-100	-283	-741	-	-728	-84	50,554	409
070	of which: SMEs	12,937	10,660	2,159	123	-	117	-67	-24	-43	-77	-	-72	0	8,784	18
080	Households	89,833	84,551	5,203	1,024	-	962	-379	-149	-230	-325	-	-314	-	75,153	446
090	Debt securities	41,081	36,675	273	90	-	79	-25	-13	-12	-41	-	-40	-	2,196	-
100	Central banks	777	777	-	-	-	-	0	0	-	0	-	-	-	-	-
110	General governments	12,185	8,865	180	12	-	6	-12	-3	-9	0	-	-	-	98	-
120	Credit institutions	20,627	20,125	28	-	-	-	-5	-5	0	-	-	-	-	2,097	-
130	Other financial corporations	4,251	3,843	44	78	-	73	-6	-3	-3	-41	-	-40	-	-	-
140	Non-financial corporations	3,241	3,066	21	0	-	-	-2	-2	0	-	-	-	-	-	-
150	Off-balance-sheet exposures	85,210	76,683	7,901	243	-	242	-147	-53	-95	-89	-	-89		4,977	35
160	Central banks	-	-	-	-	-	-	-	-	-	-	-	-		-	-
170	General governments	663	327	336	-	-	-	-15	0	-15	-	-	-		-	-
180	Credit institutions	27,684	27,544	141	7	-	7	-4	-3	-1	-4	-	-4		66	-
190	Other financial corporations	8,628	8,282	191	16	-	16	-6	-4	-2	-3	-	-3		22	0
200	Non-financial corporations	39,291	32,017	7,046	189	-	188	-111	-37	-73	-72	-	-71		846	20
210	Households	8,944	8,514	188	31	-	31	-10	-7	-3	-11	-	-11		4,043	15
220	**Total as at Dec. 31, 2022**	**546,660**	**494,307**	**45,377**	**3,251**	**-**	**3,079**	**-992**	**-342**	**-649**	**-1,368**	**-**	**-1,343**	**-84**	**143,705**	**1,077**
220	Total as at Jun. 30, 2022	558,486	528,089	21,351	3,235	-	3,071	-868	-376	-492	-1,315	-	-1,291	-143	143,128	1,152

Of the total performing exposures, 90.42 percent were assigned to stage 1 (June 30, 2022: 94.56 percent) and 9.18 percent to stage 2 (June 30, 2022: 3.82 percent). The rise in stage 2 exposures was primarily attributable to commercial real estate finance at DZ HYP. Of the non-performing exposures, 94.71 percent were assigned to stage 3 (June 30, 2022: 94.93 percent).

As at December 31, 2022, accumulated impairment for non-performing exposures amounted to €1,368 million (June 30, 2022: €1,315 million), of which 98.18 percent was assigned to stage 3 (June 30, 2022: 98.21 percent).

As at December 31, 2022, collateral and financial guarantees received for performing and non-performing exposures totaled €144,783 million (June 30, 2022: €144,280 million), of which €1,077 million or 0.22 percent (June 30, 2022: €1,152 million or 0.80 percent) were attributable to non-performing exposures.

6.4.6 Foreclosed assets

(Article 442 letter c CRR)

The DZ BANK banking group has no collateral that it obtained by taking possession of foreclosed assets (template EU CQ7).

6.5 Use of credit risk mitigation techniques

(Article 453 CRR)

6.5.1 Qualitative information on credit risk mitigation

(Article 453 letters a to e CRR)

Collateral strategy and secured transactions

In accordance with the credit risk strategy, customer credit quality forms the main basis for any lending decision; collateral has no bearing on the borrower's credit rating. However, depending on the structure of the transaction, collateral may be of material significance in the **assessment of risk** in a transaction.

Collateral in line with the level of risk is generally sought where the rating category is 3B or below on the credit rating master scale and in medium-term or long-term financing arrangements. In addition, recoverable collateral equivalent to 50 percent of the finance volume is required in the joint credit business with the local cooperative banks for new business entered into with SME customers in rating category 3E or below on the credit rating master scale.

Collateral is used as an appropriate tool for the management of risk in export finance or structured trade finance transactions. In the case of project finance, the financed project itself or the assignment of the rights in the underlying agreements typically serve as collateral.

Secured transactions in traditional lending business encompass commercial lending including financial guarantee contracts and loan commitments. In order to protect the transactions against default risk, traditional collateral is obtained, the decision being made on a case-by-case basis.

Types of collateral

The entities in the Bank sector use all forms of **traditional loan collateral**. Specifically, these include mortgages on residential and commercial real estate, registered ship and aircraft mortgages, guarantees (including sureties, credit insurance, and letters of comfort), financial security (certain fixed-income securities, shares, and investment fund units), assigned receivables (blanket and individual assignments of trade receivables), and physical collateral.

Privileged mortgages, guarantees, and financial collateral are the main sources of collateral recognized for regulatory purposes under the CRR.

Management of traditional loan collateral

Collateral management is the responsibility mainly of **specialist units**, generally outside the front-office divisions. The core tasks of these units include providing, inspecting, measuring, recording, and managing collateral and providing advice to all divisions in related matters.

To a large extent, standardized contracts are used for the provision of collateral and the associated declarations. Specialist departments are consulted in cases where customized collateral agreements are required. Collateral is managed in separate IT systems.

Collateral **is measured** in accordance with internal guidelines and is usually the responsibility of back-office units. As a minimum, carrying amounts are normally reviewed annually or on the agreed submission date for documents relevant to measurement of the collateral. Shorter monitoring intervals may be specified for critical lending exposures. Regardless of the specified intervals, collateral is tested for impairment without delay if any indications of impairment become evident.

The workout units are responsible for **recovering collateral**. In the case of non-performing loans, it is possible to depart from the general measurement guidelines and measure collateral on the basis of its likely recoverable value and time of recovery. Contrary to the general collateralization criteria, collateral involved in restructuring exposures can be measured using market values or the estimated liquidation proceeds.

Concentrations of credit risk within credit risk mitigation

The entities in the Bank sector use all forms of traditional loan collateral. Specifically, these include mortgages on residential and commercial real estate, registered ship and aircraft mortgages, guarantees (including sureties, credit insurance, and letters of comfort), financial security (certain fixed-income securities, shares, and investment fund units), assigned receivables (blanket and individual assignments of trade receivables), and physical collateral.

There is a high proportion of real estate collateral because of the business models of Bausparkasse Schwäbisch Hall and DZ HYP. Apart from this real estate collateral, the collateral at group level is well-diversified. Overall, risk concentrations arising from personal collateral and credit insurance are not considered to be critical.

The guarantors in the context of traditional loan collateral are mainly financial institutions and public-sector entities, most of which are in the VR rating classes 1A to 3A (investment grade).

The main guarantors/counterparties in credit derivatives are financial institutions, mostly investment-grade banks in the VR rating classes 1A to 2C.

6.5.2 Quantitative information on credit risk mitigation

(Article 453 letters f to j CRR)

The figure below provides an overview of the use of credit risk mitigation techniques in the DZ BANK banking group as at December 31, 2022.

FIG. 30 – EU CR3 – CRM TECHNIQUES OVERVIEW: DISCLOSURE OF THE USE OF CREDIT RISK MITIGATION TECHNIQUES
(Article 453 letter f CRR)

	Exposure class	Unsecured exposures – carrying amount	Secured exposures – carrying amount			
				of which: secured by collateral	of which: secured by financial guarantees	
	€ million					of which: secured by credit derivatives
		a	b	c	d	e
1	Loans and advances	283,286	137,575	126,105	11,470	-
2	Debt securities	38,910	2,196	2,196	-	
3	**Total as at Dec. 31, 2022**	**322,196**	**139,771**	**128,300**	**11,470**	**-**
4	*of which: non-performing exposures*	686	1,043	681	361	-
EU-5	*of which: defaulted*	686	1,043			
3	Total as at Jun. 30, 2022	336,701	137,803	126,561	11,242	-

The carrying amount of the unsecured exposures was €322,196 million as at the reporting date. Of this sum, €283,286 million or 87.92 percent was attributable to loans and advances and €38,910 million or 12.08 percent to debt securities, of which €686 million (0.21 percent) was classified as non-performing.

The carrying amount of the secured exposures came to €139,771 million, of which €137,575 million (98.43 percent) was made up of loans and advances and €2,196 million (1.57 percent) of debt securities. Of the total secured exposures, €1,043 million (0.75 percent) was classified as non-performing.

The carrying amount of the unsecured exposures was down by €14,505 million compared with June 30, 2022, the majority of which (€12,308 million) was attributable to loans and advances.

6.6 Credit risk and techniques for mitigating credit risk under the Standardized Approach

(Article 444 letters a to d CRR)

6.6.1 Qualitative information on use of the Standardized Approach

(Article 444 letters a to d CRR)

As in previous years, the rating agencies below are used to help determine the capital requirements for all exposure classes under the Standardized Approach to credit risk for which credit ratings are used:

- Standard & Poor's Ratings Services (Standard & Poor's)
- Moody's Investors Service (Moody's)
- Fitch Ratings, Ltd. (Fitch)

Transfer of credit ratings for bond issues to assets

External credit ratings awarded by recognized rating agencies or export insurance agencies are applied to assets of the DZ BANK banking group in accordance with the requirements of articles 137 to 141 CRR and apply to all exposure classes used for the Standardized Approach to credit risk listed in article 112 CRR in which external credit ratings are used (article 444 sentence 1 letter b CRR). To assess creditworthiness, the DZ BANK banking group draws on all of the main external rating sources that are available in the reporting software. The logic used by this software is described below.

In cases where an exposure-specific credit rating is not available for an exposure, and only an issuer-specific credit rating is available or a credit rating for another of the issuer's issues is awarded, DZ BANK applies this credit rating to the unrated exposure in accordance with the criteria of article 139 CRR. The available credit rating is applied if it

1. produces a higher risk weight than for the unrated exposure and the unrated exposure's ranking is equal to or lower than that of the rated exposure (article 139 (2) sentence 1 letter a CRR), or if it
2. produces a lower risk weight than for the unrated exposure and the rated exposure's ranking is equal to or higher than that of the unrated exposure (article 139 (2) sentence 1 letter b CRR).
3. If these conditions are not met, the exposure is treated as unrated pursuant to article 139 (2) sentence 2 CRR.

No bond issue credit ratings are transferred to comparable exposures of equal or higher ranking.

Currently, the DZ BANK banking group does not use the aforementioned process for applying credit ratings of issuers and issues to exposures in the banking book as it is not relevant. DZ BANK uses the standard assignment of credit ratings as published by the EBA. Therefore, no separate disclosure pursuant to article 444 sentence 1 letter d CRR is required.

6.6.2 Quantitative information on use of the Standardized Approach

(Article 444 letter e and article 453 letters f to i CRR)

6.6.2.1 Credit risk and the effects of credit risk mitigation under the Standardized Approach

(Article 453 letters g, h, and i and article 444 letter e CRR)

Fig. 31 shows the effect of all the credit risk mitigation techniques used by DZ BANK as at the reporting date resulting from the recognition of financial collateral when calculating the capital requirements under the Standardized Approach in the DZ BANK banking group. In accordance with the requirements, receivables subject to counterparty credit risk or the frameworks for securitizations are not included in this table. RWEA density is calculated by dividing exposures after credit conversion factor and credit risk mitigation by the total sum of risk-weighted assets. The values in this table are based on the regulatory figures according to the COREP report.

FIG. 31 – EU CR4 – STANDARDIZED APPROACH – CREDIT RISK EXPOSURE AND CREDIT RISK MITIGATION EFFECTS
(Article 453 letters g, h, and i and article 444 letter e CRR)

€ million	Exposure classes	Exposures before credit conversion factors (CCF) and before credit risk mitigation (CRM)		Exposures after CCF and after CRM		RWEAs and RWEA density	
		On-balance-sheet exposures	Off-balance-sheet exposures	On-balance-sheet exposures	Off-balance-sheet exposures	RWEAs	RWEA density (%)
		a	b	c	d	e	f
1	Central governments or central banks	101,990	630	105,010	965	3,560	3.36
2	Regional governments or local authorities	20,364	38	20,691	27	232	1.12
3	Public-sector entities	6,169	8	5,955	5	76	1.27
4	Multilateral development banks	1,483	-	1,702	0	-	-
5	International organizations	528	-	528	-	-	-
6	Institutions	100,258	25,302	101,946	4,252	718	0.68
7	Corporates	12,770	7,395	10,293	2,121	10,488	84.49
8	Retail business	6,265	6,224	6,116	285	4,372	68.30
9	Secured by mortgages on immovable property	2,901	8	2,741	8	1,174	42.69
10	Exposures in default	317	61	255	56	372	119.45
11	Exposures associated with particularly high risk	514	123	514	67	869	149.48
12	Covered bonds	726	-	720	-	29	4.01
13	Institutions and corporates with a short-term credit assessment	0	-	0	-	0	50.00
14	Collective investment undertakings (CIUs)	3,707	14,461	3,707	6,667	4,427	42.68
15	Long-term equity investments	39	-	39	-	39	100.00
16	Other items	932	-	1,129	0	846	74.91
17	**Total as at Dec. 31, 2022**	**258,963**	**54,250**	**261,347**	**14,452**	**27,200**	**9.86**
17	Total as at Jun. 30, 2022	276,352	55,878	278,363	15,143	26,599	9.06

As shown in Fig. 31, the on-balance-sheet and off-balance-sheet exposure values before credit conversion factor and credit risk mitigation fell by €19,016 million (columns a and b) in the second half of 2022 at DZ BANK due to transactions that ended or matured. Here too, the main factor was the decrease in business activity with central governments and central banks and with institutions. By contrast, the RWEAs increased by €749 million owing to the rise in deferred tax assets to which threshold deduction treatment is applied.

The biggest changes in the RWEAs outside the exposure classes mentioned above were registered in the following exposure classes:

- Corporates: down by €385 million (June 30, 2022: €10,873 million)
- Retail business: up by €354 million (June 30, 2022: €4,018 million)
- Institutions: down by €175 million (June 30, 2022: €893 million)
- Other items: up by €154 million (June 30, 2022: €692 million)

6.6.2.2 Breakdown of exposures by risk weight under the Standardized Approach

(Article 444 letter e CRR)

Fig. 32 provides a breakdown of the DZ BANK banking group's regulatory exposures at the reporting date, broken down by risk weight under the Standardized Approach.

FIG. 32 – EU CR5 – STANDARDIZED APPROACH
(Article 444 letter e CRR)

	Exposure classes	Risk weight (%)															Total	of which: un-rated
		0	2	4	10	20	35	50	70	75	100	150	250	370	1,250	Other		
	€ million	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
1	Central governments or central banks	104,400	-	-	-	35	-	142	-	-	9	2	1,388	-	-	-	105,975	93,789
2	Regional governments or local authorities	19,737	-	-	-	866	-	114	-	-	1	-	-	-	-	-	20,718	19,647
3	Public-sector entities	5,666	-	-	-	238	-	56	-	-	-	-	-	-	-	-	5,960	5,650
4	Multilateral development banks	1,702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,702	1,696
5	International organizations	528	-	-	-	-	-	-	-	-	-	-	-	-	-	-	528	522
6	Institutions	102,811	-	-	-	3,298	-	63	-	-	22	3	-	-	-	-	106,197	104,931
7	Corporates	39	-	-	-	1,569	0	938	0	-	9,824	44	-	-	-	-	12,414	8,148
8	Retail exposures	0	-	-	-	-	-	-	-	6,400	-	-	-	-	-	-	6,401	6,182
9	Exposures secured by mortgages on immovable property	-	-	-	-	-	2,171	307	-	-	271	-	-	-	-	-	2,749	2,478
10	Exposures in default	-	-	-	-	-	-	-	-	-	190	121	-	-	-	-	311	311
11	Exposures associated with particularly high risk	-	-	-	-	-	-	-	-	-	-	581	-	-	-	-	581	202
12	Covered bonds	572	-	-	7	141	-	-	-	-	-	-	-	-	-	-	720	590
13	Exposures to institutions and corporates with a short-term credit assessment	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0	-
14	Units or shares in collective investment undertakings (CIUs)	109	0	-	14	1,435	-	997	-	-	1,028	22	-	-	22	6,747	10,374	10,315
15	Long-term equity	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	39	35
16	Other items	297	-	-	-	5	-	-	-	-	815	-	12	-	-	-	1,129	729
17	**Total as at Dec. 31, 2022**	**235,861**	**0**	**-**	**21**	**7,587**	**2,171**	**2,616**	**0**	**6,400**	**12,199**	**774**	**1,400**	**-**	**22**	**6,747**	**275,799**	**255,224**
17	Total as at Jun. 30, 2022	253,593	0	-	10	7,835	2,122	2,691	0	5,815	12,934	724	1,090	-	13	6,678	293,506	262,611

Fig. 32 shows exposures of €275,799 million as at December 31, 2022 (June 30, 2022: €293,506 million). The decrease in the exposures in the 0 percent risk weight class mainly results from transactions that ended or matured in the second half of 2022 in the central governments and central banks exposure class, the regional governments or local authorities exposure class, and the institutions exposure class. There were no material changes in respect of the other risk weight classes compared with June 30, 2022.

6.7 Credit risk and techniques for mitigating credit risk under the IRB approach

(Article 452 and 453 CRR)

This section of the DZ BANK banking group's regulatory risk report contains only disclosures relating to the use of IRBA models to determine credit risk. Exposures subject to the framework for securitizations or to counterparty credit risk are not included in the tables in this section.

6.7.1 Qualitative information on use of the IRB approach

(Article 452 letters a and c to f CRR)

In this section, information is provided about the IRB models used in the DZ BANK banking group to calculate the RWEAs. The main features of these IRB models are described and their particular scope of application is defined. The percentage for the RWEAs is listed in section 6.7.3.1 of the regulatory risk report. This indicates the degree to which each regulatory exposure class is covered by the relevant model.

6.7.2 Rating systems

(Article 452 letter c CRR)

Characteristics of the rating systems

The generation of internal credit ratings for the counterparties of entities in the DZ BANK banking group helps to provide a solid basis for lending decisions in the management of transactions, in that the expected losses from defaults in the lending business are then factored into pricing. In addition, internal ratings are used to incorporate the credit quality of the counterparties when calculating unexpected losses in the credit portfolio.

The **VR rating system**, which is used as standard across most of the cooperative financial network, ensures that all the entities in the network apply a sophisticated uniform methodology producing ratings that are comparable.

DZ BANK primarily uses rating systems in its credit risk management system to assess large and medium-sized companies, major corporate customers, banks, investment funds, and project finance. The internal assessment approach is also used to evaluate the liquidity lines and credit enhancements made available by DZ BANK to programs for the issuance of asset-backed commercial paper (ABCP). These rating systems have been approved by the competent supervisory authority for the purposes of calculating regulatory capital using the **foundation IRB approach**. The IRB approval granted for the rating processes used in the former WGZ BANK Group for open-ended real estate funds and commercial real estate was returned and the real estate portfolio was transferred to DZ HYP.

For **internal management purposes**, DZ BANK uses further rating systems to assess SMEs (German Mittelstand), agricultural businesses, countries, public-sector entities, not-for-profit organizations, foreign SMEs, acquisition financing, asset finance, and insurance companies.

6.7.3 Development and expansion of rating systems

(Article 452 letters c and d CRR)

All internal **rating systems** and those approved by the banking supervisor for solvency reporting were **validated** in the reporting year.

Further information about the rating systems for the exposure classes used for the Standardized Approach to credit risk and the IRB approach can be found in sections 6.6.1 and 6.7.1 of this report.

6.7.3.1 Summary of internal rating systems

(Article 452 letters c and f CRR)

In 2007, the DZ BANK banking group received official approval from the competent supervisory authority to calculate its own funds using the foundation IRB approach and the IRB approach for retail business. Fig. 33, Fig. 34, and Fig. 35 show the approved internal rating systems used by the DZ BANK banking group to determine the parameters for calculating its regulatory capital requirements based on the IRB approaches. The overviews cover the rating systems developed and applied by DZ BANK that are also made available to other entities in the DZ BANK banking group, as well as those specially customized to the respective business models of BSH and DZ HYP. TeamBank uses a proprietary rating system for retail business that is described below.

FIG. 33 – RATING SYSTEMS DEVELOPED BY DZ BANK AND THEIR USE BY OTHER ENTITIES IN THE DZ BANK BANKING GROUP

				Exposure class										
								Corporates				Retail business		
Rating system	**DZ BANK**	**BSH**	**DZ HYP**	**Central governments and central banks**	**Institutions**	**Long-term equity investments**	**Securitizations**	**Corporates (narrow sense)**	**SMEs**	**Specialized lending**	**Receivables purchased**	**Mortgage-backed**	**Qualified revolving**	**Other**
VR rating for large and medium-sized companies	●							●	●					
VR rating for major corporate customers	●							●						
VR rating for banks	●	●	●		●	●								
Project finance	●									●				
Internal Assessment Approach	●						●							
Investment fund rating	●							●						

FIG. 34 – PROPRIETARY RATING SYSTEMS DEVELOPED BY BSH

	Exposure class										
					Corporates				Retail business		
Rating system	Central governments and central banks	Institutions	Long-term equity investments	Securitizations	Corporates (narrow sense)	SMEs	Specialized lending	Receivables purchased	Mortgage-backed	Qualified revolving	Other
Mortgage-backed retail business											
Application scoring									●		
Behavioral scoring									●		
LGD scoring									●		
EAD									●		
Non-mortgage-backed retail business											
Application scoring											●
Behavioral scoring											●
LGD scoring											●
EAD											●

FIG. 35 – PROPRIETARY RATING SYSTEMS DEVELOPED BY DZ HYP

	Exposure class										
					Corporates				Retail business		
Rating system	Central governments and central banks	Institutions	Long-term equity investments	Securitizations	Corporates (narrow sense)	SMEs	Specialized lending	Receivables purchased	Mortgage-backed	Qualified revolving	Other
VR rating for property developers							●				
VR rating for investors					●	●					
VR rating for property companies							●				
VR rating for project developers							●				
VR rating for housing companies					●	●					
ICRE rating (SLRE Abroad)[1]							●				
VR rating for open-ended real estate funds					●	●					
Rating for retail customers									●		
Rating for business customers, freelancers, and (retail) investors									●		
LGD model for retail customers, business customers, freelancers, and (retail) investors									●		

1) Licensed system of RSU GmbH & Co. KG.

TeamBank generally uses its consumer-finance rating system to determine the credit ratings for loan exposures in its retail business exposure class. However, the following retail products are currently covered by the Standardized Approach to credit risk:

– Purchased but not yet settled credit card transactions that, in total, are below the activation threshold for conversion into consumer finance
– Loan commitments in connection with the Finanzreserve loan facility
– Special easyCredit subportfolios: easyCredit with an account overview ('easyCredit mit Kontoblick')
– Receivables purchased in connection with the integrated e-commerce finance solution and at the point of sale ('ratenkauf by easyCredit')
– Consumer loans marketed to retail customers in Austria ('der faire Credit')

Applications to transfer the following subportfolios to the IRBA have already been submitted to the supervisory authority: loan commitments in connection with the Finanzreserve loan facility and consumer finance marketed to retail customers in Austria.

6.7.3.2 Description of internal rating systems

(Article 452 letters c, d, and f CRR)

Application of the IRB approaches requires the use of internal rating systems to classify the risks of the exposures measured using the IRB approaches and to classify guarantors. Internal rating systems are considered suitable if they meet the minimum requirements for use of the IRB approaches pursuant to article 143 CRR. Apart from meeting the requirements relating to methodology and process organization, the rating systems must have demonstrated their suitability for classifying existing and new business. Rating systems are defined by article 142 (1) no. 1 CRR as all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of exposures to rating grades or pools, and the quantification of default and loss estimates that have been developed for a certain type of exposure.

Most of the internal rating systems have been developed as the standard for the entire cooperative financial network by DZ BANK. This uniform approach for the entire cooperative network brings substantial efficiency gains for DZ BANK as the cooperative central institution and for the local cooperative banks. If DZ BANK requires rating systems for specialist segments that go beyond the scope of the rating systems developed for the cooperative network, DZ BANK will develop any such rating systems itself.

The internal rating systems used by the entities in the DZ BANK banking group feature a modular construction; they generally consist of a quantitative module and a qualitative module (although TeamBank, for example, does not use a qualitative module in standardized retail business). When rating systems are developed, various factors affecting credit ratings are identified and initially developed in isolation. The next stage is to take account of interdependencies between individual modules at the level of the overall model. The advantage of this approach is that individual modules of a particular rating system can be revised, for example, in the light of new methodical-conceptual or empirical findings, without any other module being affected by this. This reduces the cost of developing and refining rating systems.

The PD/LGD approach pursuant to article 155 (3) CRR is used for equity exposures if the equity exposure falls within the scope of a rating system approved for the IRBA and for which approval has been given. This is currently only the case for the VR rating for banks. Otherwise, the simple risk weight approach pursuant to article 155 (2) CRR is used.

A reconciliation of external and internal ratings, which illustrates the relationship between internal allocations to rating categories and external credit ratings, is presented in Fig. 22 in section 6.1.3 of this report.

The **VR rating system**, which is differentiated by customer segment, provides standardized rating methods and ensures comparability of rating results within the cooperative financial network.

The section below presents the main rating systems used by the DZ BANK banking group. These rating systems have been approved by the competent supervisory authority for the purposes of calculating regulatory own funds using the foundation IRB approach. Each of these rating systems generally differentiates between a total of 25 rating categories; 20 of these categories are for non-defaulting counterparties and 5 are for defaulting counterparties. The regulatory lower limits for the probability of default to be used in the calculation of capital requirements, known as PD floors, are taken into account for the relevant exposure class in accordance with the provisions of the CRR.

The **VR rating for large and medium-sized companies** is used for the exposure class of corporates (in the narrow sense of the term) and small and medium-sized enterprises and therefore applies to 30 percent and 42 percent respectively of the RWEAs in the corresponding exposure class in the DZ BANK banking group. This rating system covers the central institution's typical corporate customers that generate revenue of up to €1.0 billion. It is applied, among other things, to loans jointly extended by entities in the DZ BANK banking group to local cooperative banks or their customers. A characteristic of the VR rating system devised for large and medium-sized companies is the large number of historical data records of defaulting and non-defaulting customers that were collected throughout the cooperative financial network. Given this ideal data scenario, a good/bad analysis was selected as the development method.

The **VR rating for major corporate customers** is used for large domestic and international customers that generate revenue in excess of €1.0 billion and belong to the exposure class of corporates (in the narrow sense of the term). It applies to 58 percent of the RWEAs in this exposure class in the DZ BANK banking group. A characteristic of the VR rating system devised for major corporate customers is the small number of defaulting customers. Given this data scenario, the external rating method was selected as the development method. Under this approach, data was collected from many financial years for a large number of externally rated international companies from various sectors.

The **VR rating for banks** is used for the institutions exposure class and long-term equity investments exposure class and therefore applies to 100 percent of the RWEAs in the corresponding exposure classes in the DZ BANK banking group. This rating system is applied to German and international banks, irrespective of legal structure or size. It is not applied to central banks and supranational banks. The external rating method was again chosen as the development method. Under this approach, data was collected from externally rated banks worldwide. The rating system is applied irrespective of the product type (debt exposure or equity exposure), i.e. there is no dedicated procedure for equity exposures. The rules on calculating the RWEAs for equity exposures under the PD/LGD approach (article 165 CRR) are taken into account.

The internal rating systems specified below are used exclusively by DZ BANK within the banking group to calculate capital requirements:

– The **project finance rating system** is used to assess complex transport and infrastructure projects. It therefore applies to 53 percent of the RWEAs in the specialized lending exposure class in the DZ BANK banking group. As there are only a small number of external ratings available for project finance and an insufficient number of internal data sets, a combination of ratings by experts and cash flow simulations were selected to develop the rating model. DZ BANK uses the slotting approach for specialized lending to calculate the regulatory capital requirement for project finance in accordance with article 170 (2) CRR. Under this approach, institutions categorize their exposures using a five-grade scale consisting of four non-defaulted categories and one defaulted category.
– The **Internal Assessment Approach (IAA)** is used to rate liquidity lines and credit enhancements that are made available to programs for the purpose of issuing ABCP.

– The **investment fund rating system** is used for funds in Germany and Luxembourg that mainly invest in liquid fixed assets. It therefore applies to 1 percent of the RWEAs in the exposure class of corporates (in the narrow sense of the term) in the DZ BANK banking group. Because neither default data for funds in this scope of application nor external credit ratings for investment funds are available, a simulation-based approach using time series of fund returns combined with a qualitative sub-module were selected to develop this rating system.

DZ HYP

The **VR rating for property companies** assesses special-purpose entities and closed-end investment funds used in the long-term management of rented or leased property. The servicing of the loan is derived exclusively or predominantly from the current income of the property/properties on which the loan is granted. For this reason, cash flow and the change in value are simulated over the term of the loan (maximum of 20 years) and compared with the cost of the loan and the residual value. This is used to calculate the key figures DSCR and LTV, whose distribution over time determines the PD.

The procedure covers 27 percent of the RWEAs in the specialized lending exposure class in the DZ BANK banking group.

The **VR rating for property developers** assesses property developers who plan and implement residential construction projects in their own name and for their own account without carrying out any construction work themselves. The financing required for construction is settled through the sale of the individual residential properties. The rating is based on a scorecard with predominantly property-related criteria, a number of qualitative borrower criteria, and consideration of residual and completion risk.

The procedure covers 4 percent of the RWEAs in the specialized lending exposure class in the DZ BANK banking group.

The **VR rating for project developers** assesses companies that have overall project responsibility for a construction project. This includes the selection and acquisition of land, the planning and, in some cases, the construction of the property, the conclusion of rental agreements, and the handling of sales and financing. The rating is based on a scorecard with predominantly qualitative criteria concerning the management qualities of the borrower, property-related criteria, and consideration of construction, letting, and completion risk.

The procedure covers 12 percent of the RWEAs in the specialized lending exposure class in the DZ BANK banking group.

The **VR rating for housing companies** assesses companies that provide, manage and, in some cases, refurbish housing for private individuals. The rating is based on a scorecard that contains borrower criteria (e.g. management quality, profit expectations) and property-related criteria (location and vacancy rate of the homes) and takes account of accounting data.

The procedure covers 22 percent and 3 percent respectively of the RWEAs in the relevant exposure classes in the DZ BANK banking group (SMEs and corporates (in the narrow sense of the term)).

The **VR rating for investors** assesses individuals, partnerships and, in rare cases, legal entities who/that invest in residential and commercial real estate and obtain the majority of their income from the income generated by these investments. The rating is based on a scorecard with criteria relating to the borrower, the property, and ability to service debt.

The procedure covers 34 percent and 4 percent respectively of the RWEAs in the relevant exposure classes in the DZ BANK banking group (SMEs and corporates (in the narrow sense of the term)).

The **VR rating for open-ended real estate funds** assesses open-ended real estate funds of investment management companies that are subject to the rules of the German Investment Code (KAGB) or the Austrian Real Estate Investment Fund Act (ImmoInvFG) and property companies that themselves are part of the affected fund via an equity investment (provided the investment management company issued an unlimited credit order for the account of the fund prior to granting the loan). The rating consists of two submodules, a purely quantitative value change model (distance-to-default model) and an expert model that primarily comprises quantitative and qualitative factors relating to the balance sheet structure and type of portfolio. As this is a portfolio in which no defaults have been observed to date and for which no external credit ratings are available for a shadow rating approach, the score is calibrated with a central tendency determined using the Bayes formula.

The procedure covers 5 percent of the RWEAs in the corporates (narrow sense) exposure class and 2 percent of the RWEAs in the SMEs exposure class in the DZ BANK banking group.

The **ICRE rating** (International Commercial Real Estate or Specialized Lending Real Estate (SLRE) Abroad) is used to assess special-purpose entities or economically comparable exposures whose financed real estate/the focus of the real estate portfolio may be anywhere in the world outside Germany. The rating simulates the change in cash flow, which is primarily based on the projected income/proceeds from the financed property or property portfolio, and not on the general asset situation or creditworthiness of the owner of the property or property portfolio. The cash flow is examined for possible default scenarios and supplemented by qualitative criteria and any potential transfer risk.

The procedure covers 4 percent of the RWEAs in the specialized lending exposure class in the DZ BANK banking group.

DZ HYP's rating for retail customers assesses individuals who derive the majority of their income from employment. The procedure comprises an application scorecard that is used for (new) lending and determines the PD on the basis of borrower and property-related criteria. The ongoing assessment is carried out by means of a behavioral scorecard that mainly uses indicators relating to account management (reminders, arrears).

The procedure covers 7 percent of the RWEAs in the mortgage-backed retail business (non-SME) exposure class in the DZ BANK banking group.

DZ HYP's rating for business customers, freelancers, and (retail) investors assesses individuals who derive the majority of their income from self-employment. This includes business customers, freelancers, and (retail) investors. There is an engagement limit of €1 million for (retail) investors. The procedure comprises an application scorecard that is used for (new) lending and determines the PD on the basis of borrower and property-related criteria. The ongoing assessment is carried out by means of a behavioral scorecard that mainly uses indicators relating to account management (reminders, arrears).

The procedure covers 3 percent of the RWEAs in the mortgage-backed retail business (non-SME) exposure class.

The LGD model for retail customers, business customers, freelancers, and (retail) investors is a mathematical/statistical procedure for estimating the loss given default in the real estate lending business, based partly on property-specific recovery rates.

TeamBank

The **rating system of TeamBank** assesses unsecured consumer finance for individuals whose main income is derived from employment. Its scope of application covers consumer finance sold in Germany (easyCredit), including drawdowns of loan commitments under the Finanzreserve loan product featuring a credit card, and thus the IRBA other retail business exposure class. The rating is based on mathematical/statistical models for the PD and LGD components, which were developed and calibrated on the basis of TeamBank's data history covering many years. The rating is updated monthly in a fully automated process (no qualitative expert assessment/overruling).

The procedure covers 81 percent of the RWEAs in the other retail business (non-SME) exposure class in the DZ BANK banking group.

BSH

Application scoring is used for all loans in new customer lending business (with the exception of legal entities, commercial lending, and foreign lending, which are not material). Among other criteria, the procedure takes account of qualitative and quantitative characteristics, the payment history for loans already approved (progression hypothesis), and a Schufa score developed specially for BSH. There is a distinction between loans in rem and loans not in rem, whereby loans in rem are loans for which there is real security.

The procedure covers 10 percent and 2 percent respectively of the RWEAs in the relevant exposure classes in the DZ BANK banking group (mortgage-backed retail business (non-SME) and other retail business (non-SME)).

Behavioral scoring is used for the monthly assessment of the counterparty risk attaching to the entire customer loan portfolio. The assessment is carried out at individual loan agreement level. The scorecards used take into account the payment history for the past 5 years. There is a distinction between loans in rem and loans not in rem, whereby loans in rem are loans for which there is real security.

The procedure covers 80 percent and 11 percent respectively of the RWEAs in the relevant exposure classes in the DZ BANK banking group (mortgage-backed retail business (non-SME) and other retail business (non-SME)).

LGD scoring is used to determine loss given default, taking particular account of information relating to the loan collateral (e.g. the loan value) and relevant contractual and borrower characteristics. The basis for determining loss given default is the total portfolio of receivables in default that are managed in the default database.

6.7.3.3 Approved transitional rules for IRB approaches (partial use)

(Article 452 letter a CRR)

Capital requirements for credit risk in the entities within the DZ BANK banking group are always calculated using the IRB approaches as well as the Standardized Approach to credit risk (partial use). In accordance with article 150 CRR, use of the Standardized Approach to credit risk by institutions that use the IRB approach is limited; threshold values must be complied with and approval must be obtained from the supervisory authority. In order to monitor compliance, the cover ratio as defined by article 143 and article 148 CRR in conjunction with paragraph 26 of the ECB guide to internal models is calculated on an ongoing basis.

The individual IRBA institutions use internal rating systems to cover their main business lines. Only segments that are immaterial in terms of their level of credit risk will continue to use the Standardized Approach to credit risk indefinitely. The other entities use the Standardized Approach to credit risk.

In the foundation IRB approach, the PD is estimated by the institutions themselves, while the loss given default (LGD) is specified by law. LGD values in the IRB approach for retail business and the advanced IRB approach are also based on the institutions' own estimates. By contrast, the Standardized Approach to credit risk is based on risk weights that either depend on external ratings or are set in accordance with regulatory requirements.

Validation activities are carried out depending on the method chosen for a rating system (see 'Description of internal rating systems' in this section). For example, the Gini coefficient is calculated in order to assess the discriminant power of the rating systems with a good/bad analysis, whereas the hit rate is calculated under the external rating method. The minimum data history of five years as required by article 180 et seq. CRR is maintained for both the estimates and the validation of risk parameters. Validation also involves comparing the expected probability of default with the actual default rate for each rating system and, in the event of significant discrepancies, describing the underlying causes.

The DZ BANK banking group has an implementation plan that ensures compliance with the thresholds prescribed by the CRR or approved by the supervisory authority. Compliance with these thresholds is one of the preconditions for using the IRB approaches.

6.7.3.4 Use of internal estimates for purposes other than calculating risk-weighted exposures under the IRB approach

(Article 452 letter f CRR)

Internal rating systems are at the heart of credit risk management for the entities in the DZ BANK banking group. The credit ratings used for internal management purposes and regulatory reporting purposes are identical. Internal rating systems are used in the following areas:

- The **exposure limits** for lending or trading transactions for which there is a risk of default are partly determined by internal ratings.
- The profit-contribution-based **pre-analysis** of loans, which is carried out as part of operational planning and constitutes the basis for pricing, is based on sales commission and cost determinants such as standard risk costs and the regulatory and economic capital costs involved in covering expected and unexpected losses. The two latter cost components are based on internal ratings.
- The **level of authority** for decision-makers in both front-office and back-office divisions to approve loan applications is also determined by internal ratings.
- When **loans are analyzed ex post** after an agreement has been concluded, the profit contributed is determined by, for example, the standard risk costs and the regulatory and economic capital costs based on internal ratings.
- During the term of the loan, internal ratings determine the extent to which **credit quality is monitored**.
- Internal rating systems are used in the calculation of credit risk adjustments (loss allowances) in accordance with IFRS 9.
- The risk of unexpected losses is measured using **credit value-at-risk systems** that are based on internal credit ratings and the corresponding default probabilities as well as further risk parameters.
- And finally, internal ratings play a key role in **internal credit risk reporting**.

6.7.3.5 Control mechanisms for the rating systems

(Article 452 letter c CRR)

The internal rating systems used are validated once a year on the basis of internal and, in some cases, external data. **Validation** consists partly of quantitative analysis aimed at measuring the rating systems' discriminant power and stability and at calibrating them. It also includes qualitative analysis that tests the use of these rating systems for internal management purposes with respect to their model design and data quality. In addition, pool validation is carried out on the standard rating systems used throughout the cooperative financial network. When pool validation is conducted, the rating-related data of all banks that use the rating system concerned is collected and analyzed in the same way as in the internal bank validation process. If validations reveal any room for improvement, improvements are made when the rating systems are refined.

The monitoring function also includes checking that the rating systems are being properly used, regularly estimating the risk parameters derived from them, and reviewing these estimates. The findings of these monitoring activities are integrated into the internal reporting system. The key validation results are presented to the Credit Committee on a half-yearly basis.

The rating systems used by DZ BANK have been approved by the Board of Managing Directors.

The independent validation unit at DZ BANK acts as the credit risk monitoring unit for the rating systems in the Group Risk Controlling division. It operates independently of the personnel and management functions that are responsible for originating and renewing exposures. It reports directly to senior management and is responsible for monitoring DZ BANK's rating systems. Because the development and validation of rating systems have to be kept separate in accordance with regulatory requirements, some of the tasks relating to development of the systems are carried out by another unit.

The internal audit functions in the DZ BANK Group conduct an annual risk assessment for the IRBA rating systems, on the basis of which a risk-driven decision is made about whether the audit schedules should include deep-dive audits outside of the 3-year audit cycle. A deep-dive audit may examine compliance with all regulatory requirements by an entire rating system or by individual aspects of rating systems. Regardless of the outcome of the annual risk assessment, a new deep-dive audit of individual rating systems or of individual aspects of these systems must be carried out no later than three years after the previous deep-dive audit. Group standards for auditing the IRBA rating systems ensure that the audit approach is harmonized as far as possible across the group.

As well as the internal rating systems (PD models), all of the DZ BANK banking group's LGD and CCF models are validated once a year on the basis of internal and external data. This task is the responsibility of the independent validation units of the various subsidiaries in the DZ BANK banking group.

As a rule, validation of the LGD and CCF models consists of quantitative analysis aimed at measuring predictive power and stability and at calibrating the procedures. It also includes qualitative analysis that tests the use of the models for internal management purposes with respect to their model design and data quality. Furthermore, the analysis focuses on gauging whether the observations are representative of loss events that are expected in the future.

Process validation is another key aspect of the review of the LGD and CCF models. In this case, the focus is on checking the correct technical implementation of the parameters in all of the systems in which they are applied.

6.7.3.6 Process of assigning exposures and borrowers to rating categories and risk pools

(Article 452 letter f CRR)

Every borrower clearly falls into a defined area of an internal rating system based on industrial sector codes, revenue characteristics, and business specifics. As a rule, it is not possible to conduct business that bears a default risk with borrowers who do not have an internal rating. All rating systems are assigned to the relevant regulatory exposure classes. The relevant rating models are used as part of the credit application and approval process to classify the applicant or the guarantor. The classification of every borrower or guarantor must be reviewed at least once a year. All relevant input factors and ratings conducted are saved in the data processing systems so that there is a complete rating history for every customer and every transaction.

6.7.4 Quantitative information on use of the IRB approach

(Article 452 letters b, g, and h CRR)

6.7.4.1 Overview

(Article 452 letter g CRR)

Section 6.7.4 focuses on default risk for exposures under the IRB approach.

Fig. 36 and Fig. 37 show the credit risk exposures under the IRB approach for borrowers and transactions that are classified on the basis of internal credit ratings. The rating systems used internally are unambiguously assigned to one regulatory exposure class. The borrowers/transactions are assigned to a credit rating category based on their individual rating in the form of their specific default probability or the expected loss for a rating category.

6.7.4.2 Exposure amounts under the foundation IRB approach

(Article 452 letter g CRR)

Fig. 36 shows the parameters used in the DZ BANK banking group to calculate the capital requirements on the basis of IRB rating systems. The exposure classes are broken down by PD category so that the credit quality of the portfolio can be assessed. The on-balance-sheet exposures before credit conversion factor and the off-balance-sheet exposures before credit risk mitigation are disclosed in columns b and c, while columns d to m contain the regulatory values, e.g. average values for PD, LGD, and term to maturity, as well as the RWEAs and their density, expected loss (EL), and loan loss allowances and provisions for each exposure class.

FIG. 36 – EU CR6 – F-IRB APPROACH – CREDIT RISK EXPOSURES BY EXPOSURE CLASS AND PD RANGE AS AT DECEMBER 31, 2022
(Article 452 letter g CRR)

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
Central governments and central banks												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Institutions												
0.00 to < 0.15	13,089	1,705	35.15	13,533	0.05	342	32.01	2.50	2,420	17.88	2	-2
0.00 to < 0.10	12,103	1,519	37.04	12,510	0.05	285	31.96	2.50	2,125	16.99	2	-2
0.10 to < 0.15	986	186	19.67	1,023	0.10	57	32.59	2.50	295	28.83	0	0
0.15 to < 0.25	2,748	195	22.55	2,792	0.18	100	31.12	2.50	1,011	36.23	2	-2
0.25 to < 0.50	1,026	36	20.72	1,033	0.35	40	23.69	2.50	396	38.35	1	-1
0.50 to < 0.75	815	75	15.50	822	0.50	48	27.14	2.50	446	54.23	1	-1
0.75 to < 2.50	769	178	13.89	662	1.07	64	45.00	2.50	808	121.95	3	-3
0.75 to < 1.75	769	178	13.89	662	1.07	64	45.00	2.50	808	121.95	3	-3
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	550	183	20.26	527	4.98	82	45.00	2.50	982	186.23	12	-8
2.5 to < 5	186	12	5.63	186	2.60	26	45.00	2.50	289	154.85	2	-2
5 to < 10	364	171	21.30	341	6.28	56	45.00	2.50	694	203.38	10	-6
10.00 to < 100.00	64	47	20.58	37	24.53	52	43.54	2.50	101	273.69	4	-4
10 to < 20	9	17	20.19	12	13.50	12	45.00	2.50	32	262.47	1	-1
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	55	31	20.80	25	30.00	40	42.82	2.50	69	279.26	3	-3
100.00 (default)	219	7	20.00	81	100.00	13	45.00	2.50	-	-	37	-60
Subtotal	19,279	2,428	30.30	19,489	0.74	741	32.10	2.50	6,165	31.64	61	-81
Corporates – SMEs												
0.00 to < 0.15	5,705	208	72.76	5,850	0.07	694	45.00	2.50	783	13.38	1	-3
0.00 to < 0.10	4,395	175	74.71	4,523	0.05	513	45.00	2.50	551	12.18	1	-1
0.10 to < 0.15	1,309	33	62.43	1,327	0.10	181	45.00	2.50	232	17.46	0	-2
0.15 to < 0.25	2,473	302	61.23	2,651	0.19	461	45.00	2.50	673	25.40	2	-7
0.25 to < 0.50	816	365	37.32	948	0.35	276	45.00	2.50	361	38.11	1	-3
0.50 to < 0.75	388	238	65.34	534	0.50	236	45.00	2.50	248	46.46	1	-2
0.75 to < 2.50	643	662	58.30	1,010	1.05	568	45.00	2.50	650	64.30	4	-7
0.75 to < 1.75	643	662	58.30	1,010	1.05	568	45.00	2.50	650	64.30	4	-7
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	207	190	63.60	324	3.97	194	45.00	2.50	286	88.24	5	-7

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
2.5 to < 5	167	166	63.13	269	3.24	152	45.00	2.50	218	80.92	3	-4
5 to < 10	39	24	66.85	55	7.57	42	45.00	2.50	68	124.30	2	-3
10.00 to < 100.00	8	17	49.99	17	18.59	8	45.00	2.50	29	172.44	1	-2
10 to < 20	7	4	100.00	12	13.50	4	45.00	2.50	19	161.54	1	-1
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	1	13	34.10	5	30.00	4	45.00	2.50	10	196.87	1	-1
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	10,240	1,982	57.68	11,334	0.36	2,437	45.00	2.50	3,030	26.73	16	-30
Corporates – specialized lending												
0.00 to < 0.15	9,294	58	77.98	9,334	0.05	429	45.00	2.50	1,265	13.55	2	-11
0.00 to < 0.10	7,792	53	78.09	7,829	0.05	328	45.00	2.50	956	12.22	1	-9
0.10 to < 0.15	1,501	5	76.69	1,505	0.10	101	45.00	2.50	309	20.52	1	-2
0.15 to < 0.25	5,986	1,995	74.85	7,478	0.20	308	45.00	2.50	2,421	32.37	6	-26
0.25 to < 0.50	4,337	928	74.19	5,015	0.35	175	45.00	2.50	2,133	42.53	7	-31
0.50 to < 0.75	1,036	140	77.65	1,139	0.50	73	45.00	2.50	556	48.82	2	-11
0.75 to < 2.50	390	6	88.60	387	0.94	57	45.00	2.50	204	52.76	1	-5
0.75 to < 1.75	390	6	88.60	387	0.94	57	45.00	2.50	204	52.76	1	-5
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	401	17	81.17	406	4.88	18	45.00	2.50	393	96.76	6	-30
2.5 to < 5	221	4	94.80	217	2.80	16	45.00	2.50	163	75.13	2	-14
5 to < 10	180	13	77.21	190	7.24	2	45.00	2.50	231	121.42	4	-16
10.00 to < 100.00	-	13	75.00	10	30.00	32	45.00	2.50	16	163.85	1	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	13	75.00	10	30.00	32	45.00	2.50	16	163.85	1	-
100.00 (default)	39	-	-	39	100.00	5	45.00	2.50	-	-	18	-17
Subtotal	21,483	3,158	74.90	23,809	0.46	1,097	45.00	2.50	6,989	29.35	43	-132
Corporates – other												
0.00 to < 0.15	16,163	7,124	60.18	20,092	0.06	805	45.00	2.50	4,266	21.23	5	-12
0.00 to < 0.10	13,083	4,454	55.72	15,280	0.05	514	45.00	2.50	2,824	18.48	3	-10
0.10 to < 0.15	3,080	2,671	67.61	4,812	0.10	291	45.00	2.50	1,443	29.98	2	-2
0.15 to < 0.25	8,969	9,753	60.19	14,817	0.19	950	45.00	2.50	6,453	43.55	12	-18
0.25 to < 0.50	4,488	4,013	46.09	6,216	0.35	632	45.00	2.50	3,843	61.83	10	-10
0.50 to < 0.75	3,634	3,411	51.33	5,195	0.50	504	45.00	2.50	3,841	73.94	11	-14
0.75 to < 2.50	4,127	4,781	50.07	6,227	0.97	823	45.00	2.50	5,821	93.48	26	-33
0.75 to < 1.75	4,127	4,781	50.07	6,227	0.97	823	45.00	2.50	5,821	93.48	26	-33
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	1,229	947	47.75	974	4.57	171	45.00	2.50	1,468	150.71	20	-37
2.5 to < 5	712	550	43.97	602	2.86	124	45.00	2.50	796	132.32	8	-14
5 to < 10	518	397	52.98	372	7.34	47	45.00	2.50	671	180.47	12	-23
10.00 to < 100.00	281	748	44.86	301	29.24	20	45.00	2.50	746	247.99	37	-33
10 to < 20	13	1	78.36	14	13.50	6	45.00	2.50	31	227.29	1	-2
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	268	746	44.81	287	30.00	14	45.00	2.50	714	248.99	37	-30
100.00 (default)	851	140	68.41	882	100.00	251	45.00	2.50	-	-	394	-432
Subtotal	39,742	30,918	55.10	54,703	2.13	4,156	45.00	2.50	26,438	48.33	516	-588
Total of all portfolios as at Dec. 31, 2022	**90,744**	**38,486**	**55.29**	**109,335**	**1.33**	**8,431**	**39.50**	**2.50**	**42,622**	**38.98**	**636**	**-831**
Total of all portfolios as at Jun. 30, 2022	91,057	34,031	54.00	107,060	1.19	8,436	39.21	2.50	41,684	39.00	562	-658

An increase in on-balance-sheet and off-balance-sheet exposures arose in the course of normal business operations in the second half of 2022.

6.7.4.3 Exposure amounts under the advanced IRB approach

(Article 452 letter g CRR)

Fig. 37 shows the transactions assigned to the advanced IRB approach, broken down by exposure class pursuant to article 147 CRR.

FIG. 37 – EU CR6 – A-IRB APPROACH – CREDIT RISK EXPOSURES BY EXPOSURE CLASS AND PD RANGE AS AT DECEMBER 31, 2022
(Article 452 letter g CRR)

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
Central governments and central banks												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Institutions												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Corporates – SMEs												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Corporates – specialized lending												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Corporates – other												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Retail business – SMEs, secured by mortgages on immovable property												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Retail business – non-SMEs, secured by mortgages on immovable property												
0.00 to < 0.15	9,471	210	99.79	9,681	0.09	67,571	13.55	-	313	3.23	1	-1
0.00 to < 0.10	5,077	106	99.67	5,182	0.08	36,341	13.39	-	142	2.73	1	0
0.10 to < 0.15	4,394	104	99.91	4,499	0.11	31,230	13.75	-	171	3.81	1	-1
0.15 to < 0.25	6,890	494	96.18	7,365	0.17	11,864	13.52	-	370	5.02	2	-1
0.25 to < 0.50	29,207	1,881	88.58	30,873	0.33	8,716	13.40	-	2,510	8.13	14	-13
0.50 to < 0.75	11,705	1,205	88.32	12,769	0.56	2,187	13.45	-	1,530	11.99	10	-9
0.75 to < 2.50	11,038	1,430	91.48	12,346	1.13	3,900	14.04	-	2,467	19.98	20	-21
0.75 to < 1.75	9,133	1,247	91.21	10,270	0.98	3,152	13.99	-	1,878	18.28	14	-15
1.75 to < 2.5	1,904	183	93.29	2,075	1.86	748	14.30	-	590	28.41	6	-6
2.50 to < 10.00	3,115	73	90.38	3,182	4.56	999	13.73	-	1,396	43.86	20	-27
2.5 to < 5	2,234	61	90.78	2,290	3.39	766	13.85	-	889	38.84	11	-14
5 to < 10	882	12	88.36	892	7.55	233	13.41	-	506	56.74	9	-13
10.00 to < 100.00	922	32	90.08	950	27.42	904	14.32	-	818	86.07	38	-56
10 to < 20	213	3	89.84	215	13.91	271	13.43	-	156	72.60	4	-6
20 to < 30	1	1	81.54	1	20.00	1	45.00	-	3	268.31	0	-
30 to < 100	709	28	90.32	734	31.39	633	14.54	-	659	89.75	33	-50
100.00 (default)	480	9	85.69	488	100.00	222	17.60	-	307	62.87	63	-53
Subtotal	72,827	5,334	90.47	77,653	1.58	96,363	13.59	-	9,711	12.51	165	-181
Retail business – qualified revolving												
0.00 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	-	-	-	-	-	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
0.25 to < 0.50	-	-	-	-	-	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-
Retail business – other SMEs												
0.00 to < 0.15	7	-	-	7	0.12	35	24.97	-	0	5.62	0	0
0.00 to < 0.10	-	-	-	-	-	-	-	-	-	-	-	-
0.10 to < 0.15	7	-	-	7	0.12	35	24.97	-	0	5.62	0	0
0.15 to < 0.25	-	-	-	-	-	-	-	-	-	-	-	-
0.25 to < 0.50	452	-	-	0	0.38	1,710	31.14	-	0	15.42	0	0
0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-	-	-	-	-	-
0.75 to < 1.75	-	-	-	-	-	-	-	-	-	-	-	-
1.75 to < 2.5	-	-	-	-	-	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-	-	-	-	-	-
2.5 to < 5	-	-	-	-	-	-	-	-	-	-	-	-
5 to < 10	-	-	-	-	-	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-	-	-	-	-	-
10 to < 20	-	-	-	-	-	-	-	-	-	-	-	-
20 to < 30	-	-	-	-	-	-	-	-	-	-	-	-
30 to < 100	-	-	-	-	-	-	-	-	-	-	-	-
100.00 (default)	2	-	-	-	-	3	-	-	-	-	-	-
Subtotal	461	-	-	8	0.13	1,748	25.35	-	0	6.23	0	0
Retail business – other non-SMEs												
0.00 to < 0.15	3,881	18	76.57	3,895	0.12	45,334	25.48	-	293	7.51	1	0
0.00 to < 0.10	-	11	75.00	8	0.03	2	44.48	-	0	4.66	0	-
0.10 to < 0.15	3,881	7	78.90	3,887	0.12	45,334	25.44	-	292	7.52	1	0
0.15 to < 0.25	143	21	82.85	160	0.17	100	25.43	-	16	9.80	0	0
0.25 to < 0.50	2,249	42	78.63	2,272	0.35	152,220	37.29	-	524	23.05	3	-4
0.50 to < 0.75	2,481	18	81.25	2,496	0.57	187,875	44.29	-	910	36.45	6	-9
0.75 to < 2.50	3,261	30	83.42	3,287	1.28	202,499	49.42	-	1,895	57.67	21	-31
0.75 to < 1.75	2,776	26	84.25	2,798	1.13	171,995	49.39	-	1,558	55.67	16	-24
1.75 to < 2.5	485	5	78.80	489	2.15	30,504	49.61	-	338	69.13	5	-8
2.50 to < 10.00	1,121	4	79.55	1,124	4.62	83,776	47.87	-	830	73.81	24	-41
2.5 to < 5	685	4	79.99	688	3.47	49,025	48.49	-	501	72.79	12	-19
5 to < 10	436	1	76.63	436	6.44	34,751	46.88	-	329	75.42	13	-23
10.00 to < 100.00	363	5	75.05	367	25.66	26,424	45.39	-	376	102.43	42	-73
10 to < 20	210	0	79.43	210	14.23	17,682	48.23	-	206	98.21	14	-31
20 to < 30	37	5	75.00	41	25.59	3,039	49.69	-	52	128.50	5	-9
30 to < 100	116	0	75.00	116	46.35	5,703	38.77	-	117	100.95	23	-32
100.00 (default)	358	1	95.24	359	100.00	35,846	47.29	-	223	62.08	153	-172

PD range € million (unless indicated otherwise)	On-balance-sheet exposures	Off-balance-sheet exposures pre-credit conversion factors (CCF)	Exposure-weighted average CCF (%)	Exposure after CCF and after CRM	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	Risk-weighted exposure amount after supporting factors	Density of risk-weighted exposure amount (%)	Expected loss amount	Loan loss allowances and provisions
a	b	c	d	e	f	g	h	i	j	k	l	m
Subtotal	13,857	140	80.35	13,959	4.11	733,974	39.29	-	5,065	36.29	252	-331
Total of all portfolios as at Dec. 31, 2022	**87,145**	**5,474**	**90.21**	**91,620**	**1.96**	**832,085**	**17.51**	**-**	**14,776**	**16.13**	**417**	**-512**
Total of all portfolios as at Jun. 30, 2022	86,199	7,545	92.00	92,719	2.20	837,622	17.44	-	15,647	17.00	449	-552

The reduction in on-balance-sheet and off-balance-sheet exposures in Fig. 34 is attributable to transactions that ended in the retail business in the DZ BANK banking group, primarily at BSH. Improvements in credit quality in BSH's portfolio also led to a decline in the RWEAs. The decrease in loan loss allowances and provisions can be explained by the lower level of business activity. The fall in the expected loss (EL) was mainly due to the reduction in average PDs.

Average maturities within the retail business exposure class are not disclosed under the A-IRB approach because the formula for calculating RWEAs specified by the supervisory authority in the retail business exposure class under the A-IRB approach does not use the average maturity as an input. Consequently, no totals for the average maturity are disclosed either.

6.7.4.4 Scope of the use of the internal ratings-based approach and Standardized Approach

(Article 452 letter b CRR)

FIG. 38 – EU CR6-A – SCOPE OF THE USE OF THE INTERNAL RATINGS-BASED APPROACH AND STANDARDIZED APPROACH
(Article 452 letter b CRR)

	€ million (columns a and b)	Exposure value as defined in article 166 CRR for exposures subject to IRB approach	Total exposure value for exposures subject to the Standardized Approach and to the IRB approach	Percentage of total exposure value subject to permanent partial use of the SA (%)	Percentage of total exposure value subject to IRB approach (%)	Percentage of total exposure value subject to a rollout plan (%)
		a	b	c	d	e
1	Central governments or central banks	218	88,429	99.83	0.17	-
1.1	of which: regional governments or local authorities		19,380	100.00	-	-
1.2	of which: public-sector entities		6,004	96.38	3.62	-
2	Institutions	11,047	129,345	20.38	79.62	-
3	Corporates	47,624	96,744	9.20	90.80	-
3.1	of which: corporates – specialized lending, excluding slotting approach		-	-	-	-
3.2	of which: corporates – specialized lending under slotting approach		10,676	-	100.00	-
4	Retail business	72,681	148,307	7.49	92.51	-
4.1	of which: retail business – secured by mortgages on immovable		-	-	-	-

€ million (columns a and b)		Exposure value as defined in article 166 CRR for exposures subject to IRB approach	Total exposure value for exposures subject to the Standardized Approach and to the IRB approach	Percentage of total exposure value subject to permanent partial use of the SA (%)	Percentage of total exposure value subject to IRB approach (%)	Percentage of total exposure value subject to a rollout plan (%)
		a	b	c	d	e
4.2	of which: retail business – secured by mortgages on immovable		60,039	2.32	97.68	-
4.3	of which: retail business – qualified revolving		-	-	-	-
4.4	of which: retail business – other, SMEs		-	-	-	-
4.5	of which: retail business – other, non-SMEs		88,267	33.29	66.71	-
5	Long-term equity investments	6,839	6,878	0.57	99.43	-
6	Other non-credit-obligation assets	14,161	15,095	56.63	43.37	-
7	**Total as at Dec. 31, 2022**	**152,571**	**484,798**	**49.08**	**50.92**	**-**
7	Total as at Dec. 31, 2021	159,768	479,787	28.31	71.69	-

The significant difference between columns a and b is due to the different composition of each column. According to the definition, column a only shows the exposures that are subject to the IRB approach. Column b, however, shows exposures that are subject to both the Standardized Approach and the IRB approach.

The ECB, which is the competent supervisory authority, is notified of the percentage of coverage at regular intervals. If required, necessary action steps are agreed in the event of any potential changes to the regulatory requirements.

6.7.4.5 Credit derivatives exposures under the IRB approach

(Article 453 letter j CRR)

This section presents the impact of credit derivatives on the calculation of capital requirements under the IRB approach. Fig. 39 compares the RWEAs before credit risk has been mitigated using credit derivatives and the actual RWEAs (i.e. after risk mitigation using credit derivatives and guarantees), which then enables the RWEAs to be assigned to the protection provider exposure class. This may mean that the RWEAs in an exposure class are higher after credit risk mitigation than before credit risk mitigation. The RWEA disclosures are based on on-balance-sheet and off-balance-sheet exposures. Exposures subject to counterparty credit risk are not included in the following table.

FIG. 39 – EU CR7 – IRB APPROACH – EFFECT ON THE RWEAs OF CREDIT DERIVATIVES USED AS CREDIT RISK MITIGATION TECHNIQUES
(Article 453 letter j CRR)

		a	b	a	b
		Dec. 31, 2022		Jun. 30, 2022	
€ million		Risk-weighted exposure amount before credit derivatives	Actual risk-weighted exposure amount	Risk-weighted exposure amount before credit derivatives	Actual risk-weighted exposure amount
1	**Exposures under the F-IRB approach**	**50,328**	**50,328**	49,618	49,618
2	Central governments and central banks	-	-	-	-
3	Institutions	6,414	6,414	6,158	6,158
4	Corporates	43,914	43,914	43,460	43,460
4.1	of which: corporates – SMEs	3,029	3,029	3,034	3,034
4.2	of which: corporates – specialized lending	14,459	14,459	14,228	14,228
5	**Exposures under the A-IRB approach**	**14,776**	**14,776**	15,647	15,647

		a	b	a	b
		Dec. 31, 2022		Jun. 30, 2022	
€ million		Risk-weighted exposure amount before credit derivatives	Actual risk-weighted exposure amount	Risk-weighted exposure amount before credit derivatives	Actual risk-weighted exposure amount
6	Central governments and central banks	-	-	-	-
7	Institutions	-	-	-	-
8	Corporates	-	-	102	102
8.1	of which: corporates – SMEs	-	-	-	-
8.2	of which: corporates – specialized lending	-	-	-	-
9	Retail business	14,776	14,776	15,545	15,545
9.1	of which: retail business – SMEs – secured by mortgages on immovable property	-	-	-	-
9.2	of which: retail business – non-SMEs – secured by mortgages on immovable property	9,711	9,711	10,388	10,388
9.3	of which: retail business – qualified revolving	-	-	-	-
9.4	of which: retail business – SMEs – other	-	-	0	0
9.5	of which: retail business – non-SMEs – other	5,065	5,065	5,157	5,157
10	**TOTAL (including exposures under the F-IRB approach and A-IRB approach)**	**65,104**	**65,104**	**65,265**	**65,265**

The RWEAs under the F-IRB approach in Fig. 40 went up, primarily in the course of normal business operations in the DZ BANK banking group. By contrast, the RWEAs under the A-IRB approach declined owing to improvements in credit quality in BSH's portfolio.

The figures below provide an overview of the use of credit risk mitigation techniques under the F-IRB approach and A-IRB approach.

FIG. 40 – EU CR7-A – F-IRB APPROACH – DISCLOSURE OF THE EXTENT OF THE USE OF CREDIT RISK MITIGATION TECHNIQUES
(Article 453 letter g CRR)

	F-IRB	Total exposure	Credit risk mitigation techniques											Credit risk mitigation methods in the calculation of RWEAs	
			Funded credit protection (FCP)									Unfunded credit protection (UFCP)			
			Proportion of exposures covered by financial collateral (%)	Proportion of exposures covered by other eligible collateral (%)	Proportion of exposures covered by mortgages on immovable property (%)	Proportion of exposures covered by receivables (%)	Proportion of exposures covered by other physical collateral (%)	Proportion of exposures covered by other funded credit protection (%)	Proportion of exposures covered by cash on deposit (%)	Proportion of exposures covered by life insurance policies (%)	Proportion of exposures covered by instruments held by a third party (%)	Proportion of exposures covered by guarantees (%)	Proportion of exposures covered by credit derivatives (%)	RWEAs without substitution effects (reduction effects only)	RWEAs with substitution effects (both reduction and substitution effects)
	€ million (columns a, m, and n)	a	b	c	d	e	f	g	h	i	j	k	l	m	n
1	Central governments and central banks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Institutions	20,459	0.03	-	-	-	-	0.01	0.01	-	-	2.58	-	6,222	6,414
3	Corporates	99,555	0.31	32.67	32.67	-	-	0.03	0.03	-	-	2.55	-	43,540	43,914
3.1	of which: corporates – SMEs	11,332	0.36	69.73	69.73	-	-	0.01	0.01	-	-	0.49	-	3,029	3,029
3.2	of which: corporates – specialized lending	33,558	-	40.10	40.10	-	-	-	-	-	-	0.12	-	14,098	14,459
3.3	of which: corporates – other	54,665	0.48	20.43	20.43	-	-	0.06	0.06	-	-	4.46	-	26,413	26,426
4	**Total as at Dec. 31, 2022**	**120,014**	**0.26**	**27.10**	**27.10**	**-**	**-**	**0.03**	**0.03**	**-**	**-**	**2.55**	**-**	**49,763**	**50,328**
4	Total as at Jun. 30, 2022	118,327	0.18	27.92	27.92	-	-	0.02	0.02	-	-	2.30	-	48,987	49,618

The €2,888 million increase in the total exposure under the F-IRB approach, which was the result of a rise in the institutions exposure class and the corporates exposure class, arose in the course of normal business operations in the DZ BANK Group in the second half of 2022.

FIG. 41 – EU CR7-A – A-IRB APPROACH – DISCLOSURE OF THE EXTENT OF THE USE OF CREDIT RISK MITIGATION TECHNIQUES
(Article 453 letter g CRR)

	A-IRB	Total exposure	Credit risk mitigation techniques											Credit risk mitigation methods in the calculation of RWEAs	
			Funded credit protection (FCP)									Unfunded credit protection (UFCP)		RWEAs without substitution effects (reduction effects only)	RWEAs with substitution effects (both reduction and substitution effects)
			Proportion of exposures covered by financial collateral (%)	Proportion of exposures covered by other eligible collateral (%)	Proportion of exposures covered by mortgages on immovable property (%)	Proportion of exposures covered by receivables (%)	Proportion of exposures covered by other physical collateral (%)	Proportion of exposures covered by other funded credit protection (%)	Proportion of exposures covered by cash on deposit (%)	Proportion of exposures covered by life insurance policies (%)	Proportion of exposures covered by instruments held by a third party (%)	Proportion of exposures covered by guarantees (%)	Proportion of exposures covered by credit derivatives (%)		
	€ million (columns a, m, and n)	a	b	c	d	e	f	g	h	i	j	k	l	m	n
1	Central governments and central banks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Institutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Corporates	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1	of which: corporates – SMEs	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.2	of which: corporates – specialized lending	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.3	of which: corporates – other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Retail business	91,620	9.88	58.15	58.15	-	-	0.02	0.02	0.00	-	0.10	-	10,666	14,776
4.1	of which: retail business – immovable property, SMEs	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.2	of which: retail business – immovable property, non-	77,653	10.93	68.60	68.60	-	-	0.01	0.01	0.00	-	0.05	-	9,711	9,711
4.3	of which: retail business – qualified revolving	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.4	of which: retail business – other, SMEs	8	0.69	-	-	-	-	-	-	-	-	-	-	0	0
4.5	of which: retail business – other, non-SMEs	13,959	4.06	0.06	0.06	-	-	0.09	0.09	0.00	-	0.36	-	955	5,065
5	**Total as at Dec. 31, 2022**	**91,620**	**9.88**	**58.15**	**58.15**	**-**	**-**	**0.02**	**0.02**	**0.00**	**-**	**0.10**	**-**	**10,666**	**14,776**
5	Total as at Jun. 30, 2022	92,719	9.79	58.61	57.51	-	1.10	0.02	0.02	0.00	-	0.12	-	11,400	15,647

The €1,099 million decrease in the total exposure under the A-IRB approach was the result of a fall in the corporates exposure class that arose due to the migration of DVB to DZ BANK. At DZ BANK, the migrated portfolio is now measured under the Standardized Approach to credit risk.

6.7.4.6 RWEA flow statement for credit risk under the IRB approach

(Article 438 sentence 1 letter h CRR)

The figure below explains the fluctuation in the RWEAs under the IRB approach.

FIG. 42 – EU CR8 – RWEA FLOW STATEMENT FOR CREDIT RISK UNDER THE IRB APPROACH
(Article 438 sentence 1 letter h CRR)

€ million		Risk-weighted exposure amount a
1	**Risk-weighted exposure amount as at Sep. 30, 2022**	**81,528**
2	Asset size (+/-)	-1,433
3	Asset quality (+/-)	-751
4	Model updates (+/-)	-
5	Methodology and policy (+/-)	-515
6	Acquisitions and disposals (+/-)	-
7	Foreign exchange movements (+/-)	-8
8	Other (+/-)	154
9	**Risk-weighted exposure amount as at Dec. 31, 2022**	**78,976**

The RWEA amounts fell from €81,528 million as at September 30, 2022 to €78,976 million as at the reporting date. This €2,553 million reduction in the RWEAs was due to transactions that ended in the DZ BANK Group (row 2). The decrease under 'Asset quality' (row 3) was due to improvements in credit quality at BSH and optimization measures for specialized lending. There was also a decline under 'Methodology and policy' as a result of using the equity method for other long-term equity investments for the first time. The amount of €154 million under 'Other' (row 8) does not include any further significant factors for the changes in the RWEAs.

6.7.4.7 Validation results

(Article 452 letter f CRR)

The findings of the reviews of the IRBA credit rating systems and EAD/LGD models conducted as part of validations in 2022 were largely unremarkable. The validation results for all separately calibrated IRBA parameters and partial models are set out in the following table, broken down by PD, LGD, and CCF.

FIG. 43 – VALIDATION RESULTS OF THE DZ BANK BANKING GROUP AS AT DECEMBER 31, 2022

	PD		LGD		CCF	
Validation	**Number**	**EAD (%)**	**Number**	**EAD (%)**	**Number**	**EAD (%)**
Adequate	13	69.17	2	12.10	1	100.00
Too conservative – adjustment recommended	5	30.83	1	72.01	-	-
Too progressive – adjustment recommended	-	-	1	15.89	-	-
Validation not yet completed	-	-	-	-	-	-
Total	**18**	**100.00**	**4**	**100.00**	**1**	**100.00**

Individual risk parameter variants are classified as adequate if the validation does not trigger a recalibration and the current variant can continue to be used because it remains sufficiently conservative. A parameter is classified as too conservative or too progressive if the validation triggers a recalibration analysis that potentially may lead to the current variant being adjusted.

PD validations classified five models as too conservative. LGD validations classified one model as too conservative and one as too progressive. The main reason for the miscalibration was changed regulatory requirements (EBA/GL/2017/16) that had not yet been incorporated into the models in use. The notifications regarding the changes to the affected models have been submitted and checked, but the final decisions have not yet been made.

In Fig. 44 to Fig. 47, the PD determined per exposure class for the calculation of capital requirements is compared with the effective default rates of the DZ BANK banking group's borrowers, under the F-IRB and A-IRB approaches respectively.

The dark gray fields in Fig. 44 to Fig. 47 indicate that no external rating is available for the particular variant.

FIG. 44 – EU CR9 – F-IRB APPROACH – BACKTESTING OF THE PROBABILITY OF DEFAULT (PD) PER EXPOSURE CLASS AS AT DECEMBER 31, 2022
(Article 452 letter h CRR)

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
Central governments and central banks							
	0.00 to < 0.15	20	-	-	-	0.00	-
	0.00 to < 0.10	20	-	-	-	0.00	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	1	-	-	-	6.00	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	1	-	-	-	6.00	-
	10.00 to < 100.00	1	-	-	-	30.00	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	1	-	-	-	30.00	-
	100.00 (default)	-	-	-	-	-	-
Institutions							
	0.00 to < 0.15	335	-	-	0.02	0.02	-
	0.00 to < 0.10	261	-	-	0.02	0.02	-
	0.10 to < 0.15	76	-	-	0.10	0.10	-
	0.15 to < 0.25	98	-	-	0.18	0.18	-
	0.25 to < 0.50	37	-	-	0.35	0.35	-
	0.50 to < 0.75	57	-	-	0.50	0.50	-
	0.75 to < 2.50	82	-	-	1.07	1.07	-
	0.75 to < 1.75	82	-	-	1.07	1.07	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	99	-	-	4.98	4.98	-
	2.5 to < 5	27	-	-	2.60	2.60	-
	5 to < 10	72	-	-	6.28	6.28	-
	10.00 to < 100.00	34	-	-	24.53	20.00	-
	10 to < 20	7	-	-	13.50	10.00	-
	20 to < 30	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	30.00 to < 100.00	27	-	-	30.00	30.00	-
	100.00 (default)	5	5	100.00	100.00	100.00	-
Corporates – of which: SMEs							
	0.00 to < 0.15	690	-	-	0.07	0.07	-
	0.00 to < 0.10	520	-	-	0.05	0.05	-
	0.10 to < 0.15	170	-	-	0.10	0.10	-
	0.15 to < 0.25	446	-	-	0.19	0.19	-
	0.25 to < 0.50	300	-	-	0.35	0.35	-
	0.50 to < 0.75	227	-	-	0.50	0.50	-
	0.75 to < 2.50	558	-	-	1.05	1.05	-
	0.75 to < 1.75	558	-	-	1.05	1.05	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	227	-	-	3.97	3.97	-
	2.5 to < 5	170	-	-	3.24	3.24	-
	5 to < 10	57	-	-	7.57	7.57	-
	10.00 to < 100.00	5	-	-	18.59	18.59	-
	10 to < 20	4	-	-	13.50	13.59	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	1	-	-	30.00	30.00	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: specialized lending							
	0.00 to < 0.15	472	-	-	0.05	0.05	-
	0.00 to < 0.10	360	-	-	0.05	0.05	-
	0.10 to < 0.15	112	-	-	0.10	0.10	-
	0.15 to < 0.25	320	-	-	0.20	0.20	-
	0.25 to < 0.50	189	-	-	0.35	0.35	-
	0.50 to < 0.75	79	-	-	0.50	0.50	-
	0.75 to < 2.50	70	-	-	0.94	0.94	-
	0.75 to < 1.75	70	-	-	0.94	0.94	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	17	-	-	4.88	4.88	-
	2.5 to < 5	16	-	-	2.80	2.80	-
	5 to < 10	1	-	-	7.24	7.24	-
	10.00 to < 100.00	33	-	-	30.00	30.00	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	33	-	-	30.00	30.00	-
	100.00 (default)	6	-	-	100.00	100.00	-
Corporates – of which: other							
	0.00 to < 0.15	704	-	-	0.06	0.06	0.08
	0.00 to < 0.10	433	-	-	0.05	0.05	0.08
	0.10 to < 0.15	271	-	-	0.10	0.10	-
	0.15 to < 0.25	875	-	-	0.19	0.19	0.17
	0.25 to < 0.50	625	-	-	0.35	0.35	0.24
	0.50 to < 0.75	480	-	-	0.50	0.50	2.27
	0.75 to < 2.50	910	-	-	0.97	0.97	0.05
	0.75 to < 1.75	910	-	-	0.97	0.97	0.05
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	195	-	-	4.57	4.57	0.02
	2.5 to < 5	154	-	-	2.86	2.86	0.02
	5 to < 10	41	-	-	7.34	7.34	-
	10.00 to < 100.00	20	-	-	29.24	29.24	0.02
	10 to < 20	10	-	-	13.50	13.50	0.02
	20 to < 30	-	-	-	-	-	0.02

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	30.00 to < 100.00	10	-	-	30.00	30.00	-
	100.00 (default)	246	29	100.00	100.00	100.00	-

FIG. 45 – EU CR9 – F-IRB APPROACH – BACKTESTING OF THE PROBABILITY OF DEFAULT (PD) PER EXPOSURE CLASS AS AT DECEMBER 31, 2021
(Article 452 letter h CRR)

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
Central governments and central banks							
	0.00 to < 0.15	20	-	-	0.01	0.01	-
	0.00 to < 0.10	20	-	-	0.01	0.01	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Institutions							
	0.00 to < 0.15	335	-	-	0.06	0.06	-
	0.00 to < 0.10	261	-	-	0.04	0.04	-
	0.10 to < 0.15	76	-	-	0.10	0.10	-
	0.15 to < 0.25	98	-	-	0.18	0.20	-
	0.25 to < 0.50	37	-	-	0.35	0.35	-
	0.50 to < 0.75	57	-	-	0.50	0.50	-
	0.75 to < 2.50	82	-	-	1.06	1.10	-
	0.75 to < 1.75	82	-	-	1.06	1.10	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	99	-	-	5.14	6.00	-
	2.5 to < 5	27	-	-	2.60	2.60	-
	5 to < 10	72	-	-	6.68	6.00	-
	10.00 to < 100.00	34	-	-	28.49	30.00	-
	10 to < 20	7	-	-	13.50	13.50	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	27	-	-	30.00	30.00	-
	100.00 (default)	5	-	-	100.00	100.00	-
Corporates – of which: SMEs							
	0.00 to < 0.15	690	-	-	0.06	0.06	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	0.00 to < 0.10	520	-	-	0.05	0.05	-
	0.10 to < 0.15	170	-	-	0.10	0.10	-
	0.15 to < 0.25	446	-	-	0.18	0.15	-
	0.25 to < 0.50	300	-	-	0.35	0.35	-
	0.50 to < 0.75	227	-	-	0.50	0.50	-
	0.75 to < 2.50	558	-	-	0.98	1.10	-
	0.75 to < 1.75	558	-	-	0.98	1.10	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	227	-	-	3.84	4.00	-
	2.5 to < 5	170	-	-	2.92	2.50	-
	5 to < 10	57	-	-	7.04	6.00	-
	10.00 to < 100.00	5	-	-	14.60	15.00	-
	10 to < 20	4	-	-	13.50	13.50	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	1	-	-	30.00	30.00	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: specialized lending							
	0.00 to < 0.15	472	-	-	0.05	0.05	-
	0.00 to < 0.10	360	-	-	0.05	0.05	-
	0.10 to < 0.15	112	-	-	0.10	0.10	-
	0.15 to < 0.25	320	-	-	0.20	0.20	-
	0.25 to < 0.50	189	-	-	0.36	0.35	-
	0.50 to < 0.75	79	-	-	0.50	0.50	-
	0.75 to < 2.50	70	-	-	0.75	0.75	-
	0.75 to < 1.75	70	-	-	0.75	0.75	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	17	-	-	4.25	5.80	-
	2.5 to < 5	16	-	-	2.50	2.60	-
	5 to < 10	1	-	-	5.00	6.00	-
	10.00 to < 100.00	33	-	-	-	30.00	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	33	-	-	-	30.00	-
	100.00 (default)	6	2	33.33	100.00	100.00	-
Corporates – of which: other							
	0.00 to < 0.15	704	-	-	0.06	0.06	0.08
	0.00 to < 0.10	433	-	-	0.05	0.05	0.08
	0.10 to < 0.15	271	-	-	0.10	0.10	-
	0.15 to < 0.25	875	-	-	0.19	0.15	0.16
	0.25 to < 0.50	625	-	-	0.35	0.35	0.25
	0.50 to < 0.75	480	-	-	0.50	0.50	2.26
	0.75 to < 2.50	910	-	-	1.02	1.10	0.05
	0.75 to < 1.75	910	-	-	1.02	1.10	0.05
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	195	-	-	3.81	3.90	0.01
	2.5 to < 5	154	-	-	2.94	2.60	0.01
	5 to < 10	41	-	-	6.45	6.00	-
	10.00 to < 100.00	20	-	-	14.19	15.00	-
	10 to < 20	10	-	-	13.45	15.00	0.02
	20 to < 30	-	-	-	-	-	0.02
	30.00 to < 100.00	10	0	0.00	30.00	30.00	0.00
	100.00 (default)	246	26	10.57	100.00	100.00	0.80

FIG. 46 – EU CR9 – A-IRB APPROACH – BACKTESTING OF THE PROBABILITY OF DEFAULT (PD) PER EXPOSURE CLASS AS AT DECEMBER 31, 2022 (Article 452 letter h CRR)

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
Central governments and central banks							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Institutions							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: SMEs							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: specialized lending							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: other							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	9	-	-	-	-	-
	0.25 to < 0.50	12	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	55	-	-	-	-	-
	0.75 to < 1.75	54	-	-	-	-	-
	1.75 to < 2.5	1	-	-	-	-	-
	2.50 to < 10.00	34	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	34	-	-	-	-	-
	10.00 to < 100.00	4	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	4	-	-	-	-	-
	100.00 (default)	24	-	-	-	-	-
Retail business – SMEs, secured by mortgages on immovable property							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	2	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Retail business – non-SMEs, secured by mortgages on immovable property							
	0.00 to < 0.15	51,026	-	-	0.09	0.09	-
	0.00 to < 0.10	29,656	-	-	0.08	0.08	-
	0.10 to < 0.15	21,370	-	-	0.11	0.11	-
	0.15 to < 0.25	32,029	17	0.03	0.17	0.17	0.05
	0.25 to < 0.50	8,768	263	0.09	0.33	0.32	0.10
	0.50 to < 0.75	5,207	239	0.17	0.56	0.54	0.18
	0.75 to < 2.50	6,136	506	0.36	1.13	1.08	0.43
	0.75 to < 1.75	6,136	345	0.29	0.98	0.95	0.43
	1.75 to < 2.5	6,136	161	0.74	1.86	1.79	0.72
	2.50 to < 10.00	-	815	2.11	4.56	4.45	2.30
	2.5 to < 5	825	391	1.43	3.39	3.28	1.62
	5 to < 10	365	424	3.75	7.55	7.42	4.00
	10.00 to < 100.00	987	1,563	13.38	27.42	25.28	16.24
	10 to < 20	194	169	6.65	13.91	13.02	7.36
	20 to < 30	-	5	1.19	20.00	20.00	1.02
	30.00 to < 100.00	793	1,389	15.93	31.39	31.39	19.68
	100.00 (default)	418	98	1.15	100.00	100.00	-
Retail business – qualified revolving							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Retail business – other SMEs							
	0.00 to < 0.15	40	-	-	0.12	0.12	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	40	-	-	0.12	0.12	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	1,527	-	-	0.38	0.39	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	2	1	1.00	100.00	100.00	-
Retail business – other non-SMEs							
	0.00 to < 0.15	45,260	9	0.03	0.12	0.05	0.03
	0.00 to < 0.10	-	-	-	0.03	0.03	0.09
	0.10 to < 0.15	45,260	9	0.03	0.12	0.12	0.03
	0.15 to < 0.25	-	20	0.06	0.17	0.17	0.07
	0.25 to < 0.50	157,065	198	0.16	0.35	0.33	0.16
	0.50 to < 0.75	198,524	167	0.30	0.57	0.54	0.26
	0.75 to < 2.50	180,207	218	0.53	1.28	1.05	0.52
	0.75 to < 1.75	130,142	169	0.48	1.13	0.92	0.51
	1.75 to < 2.5	50,065	49	0.84	2.15	1.85	0.84
	2.50 to < 10.00	110,661	415	2.63	4.62	4.90	2.59
	2.5 to < 5	79,017	163	1.59	3.47	3.45	1.73
	5 to < 10	31,644	252	4.55	6.44	7.59	3.76
	10.00 to < 100.00	23,409	965	13.85	25.66	25.83	16.29
	10 to < 20	15,908	94	7.06	14.23	14.29	7.80
	20 to < 30	2,689	-	-	25.59	20.00	0.06
	30.00 to < 100.00	4,812	871	20.19	46.35	31.09	21.69
	100.00 (default)	35,922	5	0.09	100.00	100.00	-

FIG. 47 – EU CR9 – A-IRB APPROACH – BACKTESTING OF THE PROBABILITY OF DEFAULT (PD) PER EXPOSURE CLASS AS AT DECEMBER 31, 2021 (Article 452 letter h CRR)

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
Central governments and central banks							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Institutions							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: SMEs							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: specialized lending							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Corporates – of which: other							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0.10 to < 0.15	-	-	-	-	-	-
	0.15 to < 0.25	9	-	-	0.19	0.20	-
	0.25 to < 0.50	12	-	-	0.35	0.36	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	55	-	-	1.52	1.50	-
	0.75 to < 1.75	54	-	-	1.47	1.40	-
	1.75 to < 2.5	1	-	-	1.97	2.00	-
	2.50 to < 10.00	34	-	-	6.14	6.00	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	34	-	-	6.14	6.00	0.01
	10.00 to < 100.00	4	-	-	31.52	30.00	1.77
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	4	-	-	31.52	30.00	1.77
	100.00 (default)	24	-	-	100.00	100.00	-
Retail business – SMEs, secured by mortgages on immovable property							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0,10 bis <0,15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	2	-	-	0.35	0.35	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Retail business – non-SMEs, secured by mortgages on immovable property							
	0.00 to < 0.15	51,026	-	-	0.08	0.10	-
	0.00 to < 0.10	29,656	-	-	0.07	0.08	-
	0,10 bis <0,15	21,370	-	-	0.10	0.10	-
	0.15 to < 0.25	32,029	-	-	0.18	0.20	0.13
	0.25 to < 0.50	8,768	26	0.30	0.33	0.35	0.17
	0.50 to < 0.75	5,207	147	2.82	0.55	0.60	0.21
	0.75 to < 2.50	6,136	967	15.76	1.13	1.10	0.49
	0.75 to < 1.75	6,136	967	15.76	1.00	1.01	0.49
	1.75 to < 2.5	-	-	-	1.84	1.80	-
	2.50 to < 10.00	1,190	964	81.01	4.32	4.00	2.39
	2.5 to < 5	825	538	65.21	3.28	3.25	1.71
	5 to < 10	365	300	82.19	7.45	7.50	4.09
	10.00 to < 100.00	987	900	91.19	27.63	27.60	18.57
	10 to < 20	194	120	61.86	14.19	14.00	8.37
	20 to < 30	-	-	-	20.00	21.00	1.02
	30.00 to < 100.00	793	780	98.36	31.18	30.00	22.40
	100.00 (default)	418	180	43.06	100.00	100.00	-
Retail business – qualified revolving							
	0.00 to < 0.15	-	-	-	-	-	-
	0.00 to < 0.10	-	-	-	-	-	-
	0,10 bis <0,15	-	-	-	-	-	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	-	-	-	-	-	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Retail business – other SMEs							
	0.00 to < 0.15	40	-	-	0.12	0.10	-
	0.00 to < 0.10	-	-	-	-	-	-
	0,10 bis <0,15	40	-	-	0.12	0.10	-
	0.15 to < 0.25	-	-	-	-	-	-
	0.25 to < 0.50	1,527	-	-	0.35	0.35	-
	0.50 to < 0.75	-	-	-	-	-	-
	0.75 to < 2.50	-	-	-	-	-	-
	0.75 to < 1.75	-	-	-	-	-	-
	1.75 to < 2.5	-	-	-	-	-	-
	2.50 to < 10.00	-	-	-	-	-	-
	2.5 to < 5	-	-	-	-	-	-
	5 to < 10	-	-	-	-	-	-

Exposure class	PD range	Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Exposure-weighted average PD (%)	Average PD (%)	Average historical annual default rate (%)
a	b	c	d	e	f	g	h
	10.00 to < 100.00	-	-	-	-	-	-
	10 to < 20	-	-	-	-	-	-
	20 to < 30	-	-	-	-	-	-
	30.00 to < 100.00	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-
Retail business – other non-SMEs							
	0.00 to < 0.15	45,260	44	0.10	0.12	0.10	-
	0.00 to < 0.10	565	-	-	0.03	0.03	-
	0,10 bis <0,15	45,260	44	0.10	0.12	0.13	-
	0.15 to < 0.25	57,458	26	0.05	0.18	0.18	-
	0.25 to < 0.50	157,065	546	0.35	0.36	0.35	-
	0.50 to < 0.75	198,524	1,150	0.58	0.62	0.63	-
	0.75 to < 2.50	180,207	2,172	1.21	1.39	1.40	-
	0.75 to < 1.75	130,142	1,455	1.12	1.16	1.10	-
	1.75 to < 2.5	50,065	717	1.43	2.08	2.10	-
	2.50 to < 10.00	110,661	3,914	3.54	4.27	4.25	-
	2.5 to < 5	79,017	2,129	2.69	3.40	3.40	-
	5 to < 10	31,644	1,785	5.64	6.73	6.70	-
	10.00 to < 100.00	23,409	6,560	28.02	23.87	24.00	-
	10 to < 20	15,908	2,142	13.46	14.12	14.00	-
	20 to < 30	2,689	643	23.91	25.19	25.00	-
	30.00 to < 100.00	4,812	3,775	78.45	41.26	41.00	-
	100.00 (default)	35,922	28,008	77.97	100.00	100.00	-

6.7.4.8 Backtesting of PD for each exposure class under the IRB approach for PD estimates pursuant to article 180 (1) letter f CRR

(Article 452 letter h and article 180 (1) letter f CRR)

The PD ranges based on the internal rating categories are matched to the credit ratings used by Moody's, Standard & Poor's, and Fitch (external credit assessment institutions, ECAIs) in disclosure template EU CR9.1.

FIG. 48 – EU CR9.1 – F-IRB APPROACH – BACKTESTING OF THE PROBABILITY OF DEFAULT (PD) PER EXPOSURE CLASS AS AT DECEMBER 31, 2022
(Article 452 letter h and article 180 (1) letter f CRR)

Exposure class	PD range	External rating equivalent			Number of borrowers at end of previous year		Observed average default rate (%)	Average PD (%)	Average historical annual default rate (%)
		Moody's	Standard & Poor's	Fitch		of which: number of borrowers that defaulted in the year			
a	b		c		d	e	f	g	h
Central governments and central banks									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-
Institutions									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	94	-	-	0.03	-
	0.0331 to < 0.0414	A1	A+	A+	34	-	-	0.04	-
	0.0414 to < 0.058	A2	A	A	49	-	-	0.05	-
	0.058 to < 0.0829	A2	A	A	82	-	-	0.06	-
	0.0829 to < 0.1243	A3	A-	A-	76	-	-	0.11	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	56	-	-	0.18	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	42	-	-	0.26	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	37	-	-	0.28	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	57	-	-	0.60	-
	0.6293 to < 0.944	Ba1	BB+	BB+	33	-	-	0.90	-
	0.944 to < 1.4159	Ba2	BB	BB	39	-	-	1.40	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	10	-	-	2.08	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	16	-	-	3.18	-
	3.1858 to < 4.7788	B1	B+	B+	11	-	-	4.40	-
	4.7788 to < 7.1681	B2	B	B	34	-	-	6.80	-
	7.1681 to < 10.7522	B3	B-	B-	38	-	-	10.71	-
	10.7522 to < 16.1283	Caa	CCC	CCC	7	-	-	10.80	-
	16.1283 to < 100	Caa	CCC	CCC	27	-	-	22.50	-
	100.00	D	D	D	5	5	100.00	100.00	-
Corporates – of which: SMEs									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-

Exposure class	PD range	External rating equivalent			Number of borrowers at end of previous year		Observed average default rate (%)	Average PD (%)	Average historical annual default rate (%)
		Moody's	Standard & Poor's	Fitch		of which: number of borrowers that defaulted in the year			
a	b	c			d	e	f	g	h
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-
Corporates – of which: specialized lending									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-
Corporates – of which: other									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-

Exposure class	PD range	External rating equivalent			Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Average PD (%)	Average historical annual default rate (%)
		Moody's	Standard & Poor's	Fitch					
a	b	c			d	e	f	g	h
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-

In the DZ BANK banking group, template EU CR9.1 is relevant only to the F-IRB institutions exposure class. For the other exposure classes, the relevant external credit ratings are assigned for each PD level. The bulk of the exposures to non-governmental borrowers (institutions, corporates, and retail business) are calculated under the IRB approach (more than 50 percent coverage by internal models). Short-dated transactions are predominantly included in the retail business – other, SMEs and retail business – other, non-SMEs exposure class.

EU CR9.1 – F-IRB approach – backtesting of the probability of default (PD) per exposure class as at December 31, 2021

Exposure class	PD range	External rating equivalent			Number of borrowers at end of previous year	of which: number of borrowers that defaulted in the year	Observed average default rate (%)	Average PD (%)	Average historical annual default rate (%)
		Moody's	Standard & Poor's	Fitch					
a	b	c			d	e	f	g	h
Central governments and central banks									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-
Institutions									

Exposure class	PD range	External rating equivalent			Number of borrowers at end of previous year		Observed average default rate (%)	Average PD (%)	Average historical annual default rate (%)
		Moody's	Standard & Poor's	Fitch		of which: number of borrowers that defaulted in the year			
a	b	c			d	e	f	g	h
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	399	-	-	0.03	-
	0.0331 to < 0.0414	A1	A+	A+	238	-	-	0.04	-
	0.0414 to < 0.058	A2	A	A	606	-	-	0.05	-
	0.058 to < 0.0829	A2	A	A	528	-	-	0.07	-
	0.0829 to < 0.1243	A3	A-	A-	679	-	-	0.10	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	849	-	-	0.15	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	1,178	-	-	0.23	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	400	-	-	0.35	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	259	-	-	0.50	-
	0.6293 to < 0.944	Ba1	BB+	BB+	980	-	-	0.75	-
	0.944 to < 1.4159	Ba2	BB	BB	895	-	-	1.10	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	730	-	-	1.70	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	140	-	-	4.00	-
	4.7788 to < 7.1681	B2	B	B	110	-	-	6.00	-
	7.1681 to < 10.7522	B3	B-	B-	69	-	-	9.00	-
	10.7522 to < 16.1283	Caa	CCC	CCC	21	-	-	13.50	-
	16.1283 to < 100	Caa	CCC	CCC	85	-	-	30.00	-
	100.00	D	D	D	259	-	-	100	-
Corporates – of which: SMEs									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-
Corporates – of which: specialized lending									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-

Expo-sure class	PD range	External rating equivalent			Number of borrowers at end of previous year		Observed average default rate (%)	Average PD (%)	Average historical annual default rate (%)
		Moody's	Standard & Poor's	Fitch		of which: number of borrowers that defaulted in the year			
a	b		c		d	e	f	g	h
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-
Corporates – of which: other									
	0 to < 0.0165	Aa2	AA	AA	-	-	-	-	-
	0.0165 to < 0.0248	Aa3	AA-	AA-	-	-	-	-	-
	0.0248 to < 0.0331	A1	A+	A+	-	-	-	-	-
	0.0331 to < 0.0414	A1	A+	A+	-	-	-	-	-
	0.0414 to < 0.058	A2	A	A	-	-	-	-	-
	0.058 to < 0.0829	A2	A	A	-	-	-	-	-
	0.0829 to < 0.1243	A3	A-	A-	-	-	-	-	-
	0.1243 to < 0.1865	Baa1	BBB+	BBB+	-	-	-	-	-
	0.1865 to < 0.2797	Baa2	BBB	BBB	-	-	-	-	-
	0.2797 to < 0.4195	Baa2	BBB	BBB	-	-	-	-	-
	0.4195 to < 0.6293	Baa3	BBB-	BBB-	-	-	-	-	-
	0.6293 to < 0.944	Ba1	BB+	BB+	-	-	-	-	-
	0.944 to < 1.4159	Ba2	BB	BB	-	-	-	-	-
	1.4159 to < 2.1239	Ba3	BB-	BB-	-	-	-	-	-
	2.1239 to < 3.1858	Ba3	BB-	BB-	-	-	-	-	-
	3.1858 to < 4.7788	B1	B+	B+	-	-	-	-	-
	4.7788 to < 7.1681	B2	B	B	-	-	-	-	-
	7.1681 to < 10.7522	B3	B-	B-	-	-	-	-	-
	10.7522 to < 16.1283	Caa	CCC	CCC	-	-	-	-	-
	16.1283 to < 100	Caa	CCC	CCC	-	-	-	-	-
	100.00	D	D	D	-	-	-	-	-

6.8 Disclosures on action in response to the COVID-19 crisis and war in Ukraine

6.8.1 Relaxation of supervisory requirements; risk management measures

The lowering of the **external minimum targets** for some regulatory key figures that had been carried out by the supervisory authorities in 2020 in response to the COVID-19 pandemic continued to apply unchanged in 2022. The same was true for the lower **internal threshold values** for selected regulatory capital adequacy metrics that had been adopted by the Board of Managing Directors of DZ BANK in 2020. The banking supervisor's pandemic-related relaxing of requirements relating to the preparation of a group recovery plan in previous years ceased to apply. In particular, the number of stress scenarios to be prepared was increased to four again, compared with only two in the previous year.

As a result of the normalization of the risks arising from the COVID-19 pandemic, the **special reporting measures relating to the pandemic** implemented in 2020 were integrated into the standard risk reporting system in the first half of 2022. The financial and risk radar and the CET1 radar were no longer used.

A new instrument for reporting to the Board of Managing Directors of DZ BANK was established in February 2022, the **Russia/Ukraine radar**, which is used to closely manage and monitor risks arising from the war in Ukraine.

In response to the war in Ukraine, a one-year ad hoc scenario was added to the groupwide **stress test report** in March 2022. Among other things, this scenario assumes a complete halt in gas supplies from Russia and incorporates rising inflation and interest rates. A two-year scenario was developed in the second quarter based on the threats and risks that continue to be relevant (inflation, interest-rate increases, war in Europe) and contains the medium-term outlook of a halt in gas supplies from Russia. This two-year scenario has been reported since June 30, 2022.

6.8.2 Disclosures relating to the COVID-19 pandemic in accordance with EBA/GL/2020/07

The figures below contain information about loans and advances subject to legislative and non-legislative moratoria and about newly originated loans and advances provided under public guarantee schemes introduced in response to the COVID-19 pandemic. This information had to be disclosed for the first time as at June 30, 2020 – for an initial application period of 18 months – as a result of EBA/GL/2020/07 coming into force. In a pronouncement dated December 16, 2022, the EBA announced its decision to repeal the COVID-19-related reporting and disclosure guidelines with effect from January 1, 2023.

COVID-19 template 1 does not contain any figures as at December 31, 2022 and June 30, 2022 as the moratoria have expired. Consequently, it is no longer disclosed.

FIG. 49 – COVID-19 TEMPLATE 2 – BREAKDOWN OF LOANS AND ADVANCES SUBJECT TO LEGISLATIVE AND NON-LEGISLATIVE MORATORIA BY RESIDUAL MATURITY OF MORATORIA

December 31, 2022

		a	b	c	d	e	f	g	h	i
			Gross carrying amount							
						Residual maturity of moratoria				
	€ million	Number of borrowers		of which: legislative moratoria	of which: expired	<= 3 months	> 3 months <= 6 months	> 6 months <= 9 months	> 9 months <= 12 months	> 1 year
1	Loans and advances for which moratorium was offered	51,341	1,360							
2	Loans and advances subject to moratorium (granted)	49,924	1,331	460	1,331	-	-	-	-	-
3	of which: households		1,281	431	1,281	-	-	-	-	-
4	of which: collateralized by residential immovable property		1,174	349	1,174	-	-	-	-	-
5	of which: non-financial corporations		48	27	48	-	-	-	-	-
6	of which: small and medium-sized enterprises		-	-	-	-	-	-	-	-
7	of which: collateralized by commercial immovable property		1	1	1	-	-	-	-	-

June 30, 2022

	€ million	a	b	c	d	e	f	g	h	i
			Gross carrying amount							
						Residual maturity of moratoria				
		Number of borrowers		of which: legislative moratoria	of which: expired	<= 3 months	> 3 months <= 6 months	> 6 months <= 9 months	> 9 months <= 12 months	> 1 year
1	Loans and advances for which moratorium was offered	51,544	1,426							
2	Loans and advances subject to moratorium (granted)	50,097	1,414	491	1,414	-	-	-	-	-
3	of which: households		1,361	461	1,361	-	-	-	-	-
4	of which: collateralized by residential immovable property		1,243	371	1,243	-	-	-	-	-
5	of which: non-financial corporations		52	29	52	-	-	-	-	-
6	of which: small and medium-sized enterprises		-	-	-	-	-	-	-	-
7	of which: collateralized by commercial immovable property		1	1	1	-	-	-	-	-

As at the reporting date, a moratorium had been offered to 51,341 borrowers (June 30, 2022: 51,544 borrowers). This equates to a gross carrying amount of €1,360 million (June 30, 2022: €1,426 million). A moratorium was actually granted to 49,924 borrowers, representing a gross carrying amount of €1,331 million (June 30, 2022: 50,097 borrowers representing a gross carrying amount of €1,414 million). This equates to a share of 97.84 percent (June 30, 2022: 99.19 percent).

Almost all of the loans and advances were granted to households, which accounted for a share of 96.24 percent (June 30, 2022: 96.21 percent); the remaining gross carrying amount (€48 million) was attributable to non-financial corporations (June 30, 2022: €52 million). Legislative moratoria accounted for 34.53 percent or a gross carrying amount of €460 million (June 30, 2022: 34.69 percent or a gross carrying amount of €491 million). Expired moratoria accounted for a gross carrying amount of €1,331 million (June 30, 2022: €1,414 million), which equates to 100.00 percent of the loans and advances granted (June 30, 2022: 100.00 percent).

FIG. 50 – COVID-19 TEMPLATE 3 – INFORMATION ON NEWLY ORIGINATED LOANS AND ADVANCES PROVIDED UNDER NEWLY APPLICABLE PUBLIC GUARANTEE SCHEMES INTRODUCED IN RESPONSE TO THE COVID-19 CRISIS

December 31, 2022

		a	b	c	d
		Gross carrying amount		Maximum amount of the guarantee that can be considered	Gross carrying amount
€ million			of which: forborne	Public guarantees received	Inflows to non-performing exposures
1	Newly originated loans and advances subject to public guarantee schemes	1,176	226	1,007	33
2	of which: households	1			-
3	of which: collateralized by residential immovable property	-			-
4	of which: non-financial corporations	1,151	212	986	32
5	of which: small and medium-sized enterprises	656			2
6	of which: collateralized by commercial immovable property	31			-

June 30, 2022

		a	b	c	d
		Gross carrying amount		Maximum amount of the guarantee that can be considered	Gross carrying amount
€ million			of which: forborne	Public guarantees received	Inflows to non-performing exposures
1	Newly originated loans and advances subject to public guarantee schemes	1,305	244	1,117	14
2	of which: households	1			-
3	of which: collateralized by residential immovable property	-			-
4	of which: non-financial corporations	1,278	230	1,094	14
5	of which: small and medium-sized enterprises	727			2
6	of which: collateralized by commercial immovable property	32			-

The gross carrying amount of the newly originated loans and advances provided under public guarantee schemes was €1,176 million as at December 31, 2022 (June 30, 2022: €1,305 million). Of the total amount, €226 million (19.18 percent) was attributable to forborne loans (June 30, 2022: €244 million or 18.67 percent). The bulk of the loans (€1,151 million) were accounted for by non-financial corporations (June 30, 2022: €1,278 million), which equates to 97.86 percent of the aforementioned total gross carrying amount (June 30, 2022: 97.89 percent).

A gross carrying amount of €1,007 million was covered by public guarantees (June 30, 2022: €1,117 million), which equates to 85.62 percent of the total gross carrying amount of the loans and advances of €1,176 million (June 30, 2022: 85.59 percent of the total gross carrying amount of €1,305 million).

6.9 Counterparty credit risk

(Article 439 CRR)

6.9.1 Required qualitative disclosures

Table EU CCRA – Qualitative disclosures related to counterparty credit risk (CCR)
(Article 439 letters a to d and final paragraph CRR)

Definition of counterparty credit risk

In the Bank sector in Pillar 2, counterparty credit risk is assigned to credit risk as replacement risk and refers to the risk of the counterparty to a transaction defaulting before the final settlement of the payments associated with that transaction. The counterparty is the other party in a derivatives transaction or securities financing transaction (SFT).

A special feature of counterparty credit risk in Pillar 1 is that, in contrast to other types of credit risk, article 271 CRR stipulates that transactions in the trading book be taken into account in addition to transactions in the banking book.

The DZ BANK banking group consistently uses the Standardized Approach for Counterparty Credit Risk (SA-CCR) to calculate the RWEAs for derivative transactions in Pillar 1. The simplified SA-CCR and the SA-CCR original exposure method are not used. The calculation of the RWEAs for securities financing transactions is based entirely on the financial collateral comprehensive method. Valuation methods based on internal models are not used to calculate the RWEAs for counterparty credit risk.

Description of credit risk in connection with trading activities

Explanations concerning the measurement of replacement risk and the related limit system in risk management can be found in section 6.1.4.

Central counterparties

Under EMIR, market players must report all exchange-traded and OTC derivatives to central trade repositories and use predefined steps to settle certain standardized OTC derivatives via central counterparties (known as clearing houses). Furthermore, risk mitigation methods have to be used for OTC derivatives that are not settled centrally through a clearing house. This is intended to minimize counterparty credit risk.

Any market players not exempted from this clearing obligation must be connected to a central counterparty. The market player concerned may be a direct member of a clearing house or may process its derivative contracts using a bank that is a member of a central counterparty.

DZ BANK is a direct member of the London Clearing House, which is Europe's largest clearing house for interest-rate derivatives, and of Eurex Clearing AG. DZ BANK therefore has direct access to central counterparties for derivatives for the purposes of clearing derivative transactions. In the case of credit derivatives, it also has indirect access to the Intercontinental Exchange clearing house via clearing broker Deutsche Bank.

Wrong-way risk in trading activities

General wrong-way risk can arise as a result of DZ BANK's trading activities. This is defined as the risk of a positive correlation between the default probability of a counterparty and the replacement value (replacement risk exposure) of a (hedging) transaction entered into with this counterparty because of a change in the macroeconomic market factors of the traded underlying instrument (e.g. price changes for exchange rates).

Specific wrong-way risk can also occur. This is the risk of a positive correlation between the default probability of a counterparty and the replacement value (replacement risk exposure) of a (hedging) transaction entered into with this counterparty because of an increase in the default probability of the issuer of the traded underlying instrument. This type of risk largely arises in connection with OTC equity and credit derivatives in which the underlying instrument is a (reference) security or (reference) issuer.

Measures to prevent concentration risk and wrong-way risk

In order to prevent unwanted risks that may arise from the concentration or correlation of collateral in the trading business or from general wrong-way risk, DZ BANK has brought into force a **collateral policy** and its own internal **minimum requirements for bilateral reverse repo transactions and securities lending transactions**. Both policies are described below in the section on collateral management.

If material specific wrong-way risk arises in connection with a bilateral OTC trading transaction, it is taken into account when the exposure is calculated, both in the regulatory perspective and in the economic perspective. The RWEAs are calculated in accordance with article 291 (5) CRR.

The **Risk Committee** receives quarterly reports on relevant wrong-way risk and concentration risk arising in connection with derivatives and securities financing, including any necessary exposure adjustments.

Collateral management

In addition to **netting agreements** (ISDA Master Agreement and German Master Agreement for Financial Futures), both collateral agreements for variation margin (Credit Support Annex to the ISDA Master Agreement and Collateralization Annex to the German Master Agreement for Financial Futures) and collateral agreements for initial margin are entered into as instruments to reduce credit exposure in OTC transactions.

DZ BANK's **collateral policy** regulates the economic aspects of collateral agreements and the responsibilities and authorization levels. This policy specifies contractual parameters, such as the type and quality of collateral, minimum transfer amounts, and delivery deadlines as permitted by regulatory requirements. As a rule, the collateral policy permits only collateral in the form of cash (in euros) to be accepted for mitigating risks arising from OTC derivatives on the basis of the Credit Support Annex (ISDA Master Agreement) and the Collateralization Annex (German Master Agreement for Financial Futures). General exceptions to this rule exist for older contracts entered into before the collateral agreement obligation came into force and, in particular, for contracts with local cooperative banks that permit thresholds and securities collateral. Securities collateral must be eligible as collateral with the ECB and have a minimum credit rating of A3 (Moody's) or A- (Standard & Poor's, Fitch Ratings). Exceptions to the standard conditions are approved on the basis of the authorization levels specified in the collateral policy.

High-grade collateral is also required for repo and securities lending transactions in compliance with generally accepted master agreements and DZ BANK's own internal **minimum requirements for bilateral reverse repo transactions and securities lending transactions**, although the range of collateral is somewhat broader here than in the case of OTC derivatives. There are a few individual exceptions for banks in the cooperative financial network.

Furthermore, the minimum requirements applicable at DZ BANK exclude prohibited correlations and specify collateral quality depending on the credit rating of the counterparties. The relevant rules are monitored on a daily basis and any infringements of the requirements are reported each month to the Risk Committee.

DZ BANK regularly uses **bilateral collateral agreements**. Exceptions apply to cover assets and special-purpose entities, as the special legal status of the counterparties means that only unilateral collateral agreements can be usefully enforced, and to supranational or government entities. Any decision not to use a bilateral collateral agreement for counterparties not subject to the European Market Infrastructure Regulation (EMIR) rules must be approved by a person with the relevant authority.

Netting and collateralization generally result in a significant reduction in the exposure from trading business, both in the economic perspective and in the regulatory perspective. IT systems are used to measure exposures and collateral. **Margining** is carried out on a daily basis for the vast majority of collateral agreements in accordance with the collateral policy requirements.

Collateral agreements generally include minimum transfer amounts and, in some cases, also **thresholds** that are independent of the credit rating. There are also some agreements with triggers based on the credit rating. In these agreements, for example, the unsecured part of an exposure is reduced in the event of a ratings downgrade or the borrower is required to make additional payments (for example, payments known as 'independent amounts'). The supervisory authorities have specified these contractual provisions as standard for EMIR-compliant agreements.

In the derivatives business, there are master agreements entered into with individual counterparties that contractually require additional collateral to be provided to the counterparty in the event of DZ BANK's external credit rating being downgraded (article 439 sentence 1 letter d CRR). A three-notch downgrade as at December 31, 2022 would have led to additional collateral being provided in a total amount of around €616 million.

EMIR requires the exchange of an initial margin in bilateral OTC derivatives transactions in addition to the variation margin. The transfer of initial margin takes account of counterparty-specific thresholds.

6.9.2 Regulatory counterparty credit risk

(Article 439 letters e to m CRR)

6.9.2.1 Analysis of counterparty credit risk

(Article 439 letters f, g, k, and m CRR)

Fig. 51 describes the use of the methods for calculating the regulatory requirements for counterparty credit risk in accordance with article 273 et seq. CRR as well as the main parameters of each method.

FIG. 51 – EU CCR1 – ANALYSIS OF CCR EXPOSURE RISK BY APPROACH
(Article 439 letters f, g, k, and m CRR)

		a	b	c	d	e	f	g	h
€ million		**Replace-ment cost (RC)**	**Potential future exposure value (PFE)**	**Expected effective positive exposure (EEPE)**	**Alpha used for computing regulatory exposure value**	**Exposure value before CRM**	**Exposure value after CRM**	**Exposure value**	**RWEA**
EU-1	EU – original exposure method (for derivatives)	-	-		1.4	-	-	-	-
EU-2	EU – simplified SA-CCR (for derivatives)	-	-		1.4	-	-	-	-
1	SA-CCR (for derivatives)	3,717	3,992		1.4	20,464	11,004	11,000	3,316
2	IMM (for derivatives and SFTs)			-	1.4	-	-	-	-
2a	of which: netting sets for securities financing transactions			-		-	-	-	-
2b	of which: netting sets for derivatives and long-settlement transactions			-		-	-	-	-
2c	of which: contractual cross-product netting sets			-		-	-	-	-
3	Financial collateral simple method (for SFTs)					-	-	-	-

		a	b	c	d	e	f	g	h
€ million		Replace-ment cost (RC)	Potential future exposure value (PFE)	Expected effective positive exposure (EEPE)	Alpha used for computing regulatory exposure value	Exposure value before CRM	Exposure value after CRM	Exposure value	RWEA
4	Financial collateral comprehensive method (for SFTs)					5,151	1,716	1,716	33
5	VaR for SFTs					-	-	-	-
6	**Total as at Dec. 31, 2022**					**25,615**	**12,719**	**12,716**	**3,348**
6	Total as at Jun. 30, 2022					27,379	14,066	14,071	4,725

As at the reporting date, the RWEAs resulting from counterparty credit risk were lower than as at June 30, 2022. This was largely due to an optimization measure in connection with external ratings.

6.9.2.2 Capital requirement for adjustment of the credit valuation

(Article 439 letter h CRR)

The exposure value and the risk-weighted exposure amount (RWEA) for transactions subject to capital requirements for credit valuation adjustments (CVA charge) must be disclosed separately. Based on the requirements in the CRR, Fig. 52 shows the regulatory calculations for adjustment of the credit valuation (broken down into the standardized and advanced approaches).

FIG. 52 – EU CCR2 – TRANSACTIONS SUBJECT TO CAPITAL REQUIREMENTS FOR CVA RISK
(Article 439 letter h CRR)

		a	b	a	b
		Dec. 31, 2022		Jun. 30, 2022	
€ million		**Exposure value**	**RWEA**	Exposure value	RWEA
1	Total transactions subject to the advanced method	-	-	-	-
2	(i) VaR component (including the 3x multiplier)		-		-
3	(ii) Stressed VaR component (sVaR) (including the 3x multiplier)		-		-
4	Transactions subject to the standardized method	4,700	1,462	4,898	1,491
EU4	Transactions subject to the alternative approach (based on the original exposure method)	-	-	-	-
5	**Total transactions subject to capital requirements for CVA risk**	**4,700**	**1,462**	**4,898**	**1,491**

The capital requirement for the credit valuation adjustment as at December 31, 2022 fell only moderately in the second half of the year.

6.9.2.3 Exposures to central counterparties (CCPs)

(Article 439 sentence 1 letter i CRR)

Specific information about credit risk arising from derivatives with central counterparties (CCPs) and the associated exposures is shown in Fig. 53.

FIG. 53 – EU CCR8 – EXPOSURES TO CENTRAL COUNTERPARTIES (CCPs)
(Article 439 sentence 1 letter i CRR)

		a	b	a	b
		Dec. 31, 2022		Jun. 30, 2022	
€ million		**Exposure value**	**RWEA**	Exposure value	RWEA
1	**Exposures to qualifying CCPs (total)**		**411**		**422**
2	Exposures for trades at qualifying CCPs (excluding initial margin and default fund contributions); of which:	5,183	290	3,379	228
3	(i) OTC derivatives	3,488	256	2,078	202
4	(ii) Exchange-traded derivatives	710	14	553	11
5	(iii) SFTs	985	20	748	15
6	(iv) Netting sets where cross-product netting has been approved	-	-	-	-
7	Segregated initial margin	1,050		1,191	
8	Non-segregated initial margin	590	36	823	98
9	Prefunded default fund contributions	263	86	379	96
10	Unfunded default fund contributions	525	-	-	-
11	**Exposures to non-qualifying counterparties (total)**		-		-
12	Exposures for trades at non-qualifying counterparties (excluding initial margin and default fund contributions); of which:	-	-	-	-

€ million		a	b	a	b
		Dec. 31, 2022		Jun. 30, 2022	
		Exposure value	RWEA	Exposure value	RWEA
13	(i) OTC derivatives	-	-	-	-
14	(ii) Exchange-traded derivatives	-	-	-	-
15	(iii) SFTs	-	-	-	-
16	(iv) Netting sets where cross-product netting has been approved	-	-	-	-
17	Segregated initial margin	-		-	
18	Non-segregated initial margin	-	-	-	-
19	Prefunded default fund contributions	-	-	-	-
20	Unfunded default fund contributions	-	-	-	-

Exposures to qualifying central counterparties were lower as at the reporting date than at June 30, 2022. The decrease comprised two opposing effects: The volume of OTC derivatives went up (row 3), whereas the volume of non-segregated initial margin went down (row 8).

6.9.3 Counterparty credit risk exposures: Standardized Approach

(Article 439 letter l in conjunction with article 444 letter e CRR)

Fig. 54 shows the counterparty credit risk exposures after credit risk mitigation, broken down by portfolio (type of counterparty) and risk weight (risk content attributed according to the Standardized Approach).

FIG. 54 – EU CCR3 – STANDARDIZED APPROACH – CCR EXPOSURES BY REGULATORY EXPOSURE CLASS AND RISK WEIGHT
(Article 439 letter l in conjunction with article 444 letter e CRR)

€ million	Exposure classes	Risk weight											
		a	b	c	d	e	f	g	h	i	j	k	l
		0%	2%	4%	10%	20%	50%	70%	75%	100%	150%	Other	Total exposure value
1	Central governments or central banks	138	-	-	-	-	59	-	-	1	-	-	198
2	Regional governments or local authorities	135	-	-	-	6	-	-	-	-	-	-	141
3	Public-sector entities	245	-	-	-	-	-	-	-	-	-	-	245
4	Multilateral development banks	2,378	-	-	-	-	-	-	-	-	-	-	2,378
5	International organizations	-	-	-	-	-	-	-	-	-	-	-	-
6	Institutions	1,715	-	-	-	4	0	-	-	-	-	-	1,719
7	Corporates	-	-	-	-	281	1,272	-	-	1,593	-	-	3,146
8	Retail business	-	-	-	-	-	-	-	-	-	-	-	-
9	Institutions and corporates with a short-term credit assessment	-	-	-	-	-	-	-	-	-	-	-	-
10	Other items	-	-	-	-	-	0	-	-	5	-	-	5
11	**Total exposure value as at Dec. 31, 2022**	**4,612**	**-**	**-**	**-**	**291**	**1,332**	**-**	**-**	**1,599**	**-**	**-**	**7,833**
11	Total exposure value as at Jun. 30, 2022	4,640	-	-	-	342	186	-	-	3,148	-	-	8,316

An optimization measure in connection with external ratings is reflected in the reduction in the total exposure compared with June 30, 2022, primarily in the corporates exposure class. The changes between the reporting dates of June 30, 2022 and December 31, 2022 in the other exposure classes were the result of fluctuation within the normal range.

6.9.4 Counterparty credit risk exposures: IRB approach

(Article 439 letter l in conjunction with article 452 letter g CRR)

Fig. 55 shows key parameters used to calculate the capital requirements for counterparty credit risk in the IRB models.

FIG. 55 – EU CCR4 – F-IRB APPROACH – CCR EXPOSURES BY EXPOSURE CLASS AND PD SCALE
(Article 439 letter l in conjunction with article 452 letter g CRR)

€ million (unless indicated otherwise)		a	b	c	d	e	f	g
		Exposure value	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	RWEA	Density of risk-weighted exposure amounts
	PD scale by exposure class							
11	Central governments and central banks							
1	0.00 to < 0.15	-	-	-	-	-	-	-
2	0.15 to < 0.25	-	-	-	-	-	-	-
3	0.25 to < 0.50	-	-	-	-	-	-	-
4	0.50 to < 0.75	-	-	-	-	-	-	-
5	0.75 to < 2.50	-	-	-	-	-	-	-
6	2.50 to < 10.00	-	-	-	-	-	-	-
7	10.00 to < 100.00	-	-	-	-	-	-	-
8	100.00 (default)	-	-	-	-	-	-	-
11	Subtotal	-	-	-	-	-	-	-
12	Institutions							
1	0.00 to < 0.15	3,223	0.05	136	45.00	2.50	669	20.77
2	0.15 to < 0.25	821	0.16	44	45.00	2.50	382	46.54
3	0.25 to < 0.50	55	0.35	19	45.00	2.50	37	66.90
4	0.50 to < 0.75	299	0.50	16	45.00	2.50	46	15.24
5	0.75 to < 2.50	4	0.85	8	45.00	2.50	3	91.64
6	2.50 to < 10.00	3	7.75	7	45.00	2.50	4	152.72
7	10.00 to < 100.00	1	30.00	9	45.00	2.50	2	293.50
8	100.00 (default)	-	-	-	-	-	-	-
12	Subtotal	4,406	0.12	239	45.00	2.50	1,144	25.96
13	Corporates – SMEs							
1	0.00 to < 0.15	1	0.10	3	45.00	2.50	0	22.73
2	0.15 to < 0.25	12	0.23	33	45.00	2.50	4	35.78
3	0.25 to < 0.50	14	0.35	30	45.00	2.50	6	43.49
4	0.50 to < 0.75	8	0.50	28	45.00	2.50	4	47.90
5	0.75 to < 2.50	8	1.14	75	45.00	2.50	5	68.17
6	2.50 to < 10.00	6	3.30	34	45.00	2.50	5	89.13
7	10.00 to < 100.00	-	-	-	-	-	-	-
8	100.00 (default)	-	-	-	-	-	-	-
13	Subtotal	48	0.83	203	45.00	2.50	25	51.62
14	Corporates – specialized lending							
1	0.00 to < 0.15	46	0.00	128	45.00	2.50	34	75.09
2	0.15 to < 0.25	8	-	26	-	-	7	83.48
3	0.25 to < 0.50	4	-	20	-	-	3	74.69
4	0.50 to < 0.75	26	-	21	-	-	22	84.45
5	0.75 to < 2.50	2	-	29	-	-	2	90.00
6	2.50 to < 10.00	0	-	7	-	-	0	92.18
7	10.00 to < 100.00	0	-	5	-	-	0	115.00

€ million (unless indicated otherwise)		a	b	c	d	e	f	g
	PD scale by exposure class	Exposure value	Exposure-weighted average PD (%)	Number of borrowers	Exposure-weighted average LGD (%)	Exposure-weighted average maturity (years)	RWEA	Density of risk-weighted exposure amounts
8	100.00 (default)	-	-	-	-	-	-	-
14	**Subtotal**	**87**	**0.00**	**236**	**45.00**	**2.50**	**69**	**79.24**
15	**Corporates – other**							
1	0.00 to < 0.15	1,117	0.07	169	45.00	2.50	304	27.23
2	0.15 to < 0.25	475	0.18	126	45.00	2.50	228	48.08
3	0.25 to < 0.50	83	0.35	87	45.00	2.50	54	64.38
4	0.50 to < 0.75	52	0.50	82	45.00	2.50	39	74.11
5	0.75 to < 2.50	178	1.18	151	45.00	2.50	181	101.91
6	2.50 to < 10.00	28	4.88	44	45.00	2.50	44	156.26
7	10.00 to < 100.00	4	30.00	1	45.00	2.50	12	263.75
8	100.00 (default)	7	100.00	13	45.00	2.50	-	-
15	**Subtotal**	**1,945**	**0.71**	**673**	**45.00**	**2.50**	**862**	**44.31**
y	**Total as at Dec. 31, 2022**	**6,486**	**0.30**	**1,351**	**45.00**	**2.50**	**2,099**	**32.37**
y	Total as at Jun. 30, 2022	7,566	0.40	1,437	36.20	2.50	2,454	32.44

The decrease in the exposure amount was largely due to transactions that ended and to a fall in the exposures in the second half of 2022. It was primarily attributable to the institutions exposure class and the corporates – other exposure class.

Template EU CCR4 – A-IRB is no longer disclosed due to the complete migration of DVB to DZ BANK in the third quarter of 2022. The transactions previously disclosed under the A-IRB approach have been switched to the Standardized Approach to credit risk because DZ BANK does not have A-IRB approval.

6.9.5 Further information on counterparty credit risk

(Article 439 letters e and j CRR)

6.9.5.1 Composition of collateral for exposures subject to counterparty credit risk

(Article 439 letter e CRR)

Fig. 56 provides a breakdown for all types of collateral (cash collateral, sovereign debt, corporate bonds, etc.) received or posted by DZ BANK or the DZ BANK banking group in order to reduce counterparty credit risk related to derivatives transactions or securities financing transactions, including transactions cleared through a central counterparty.

FIG. 56 – EU CCR5 – COMPOSITION OF COLLATERAL FOR CCR EXPOSURES
(Article 439 letter e CRR)

		a	b	c	d	e	f	g	h
		Collateral used in derivatives transactions				Collateral used in securities financing transactions			
		Fair value of collateral received		Fair value of collateral posted		Fair value of collateral received		Fair value of collateral posted	
€ million	Collateral type	Segregated	Un-segregated	Segregated	Un-segregated	Segregated	Un-segregated	Segregated	Un-segregated
1	Cash – domestic currency	-	33,702	-	15,196	-	697	-	17
2	Cash – other currencies	-	522	-	196	-	-	-	26
3	Domestic sovereign debt	-	24	-	-	-	4,534	-	-
4	Other sovereign debt	-	35	-	-	-	4,270	-	154
5	Government agency debt	-	1,331	-	-	-	160	-	-
6	Corporate bonds	-	111	-	-	-	2	-	3
7	Equity securities	-	1,361	-	-	-	4	-	480
8	Other collateral	-	938	4,268	1,158	-	26	-	8,816
9	**Total as at Dec. 31, 2022**	**-**	**38,024**	**4,268**	**16,550**	**-**	**9,694**	**-**	**9,497**
9	Total as at Jun. 30, 2022	-	26,754	2,825	13,829	-	17,551	-	5,452

The changes in the derivatives business were attributable to ongoing market fluctuation (in particular, the rise in interest rates) in the second half of 2022. In this period, there were also changes in SFT business due to transactions that ended.

6.9.5.2 Credit derivatives exposures

(Article 439 letter j CRR)

Fig. 57 shows the notional amounts of credit derivatives bought and sold, broken down by type of credit derivative. As had been the case at the end of previous reporting periods, no credit derivatives from the intermediary operations of DZ BANK banking group entities were held as at December 31, 2022.

FIG. 57 – EU CCR6 – CREDIT DERIVATIVES EXPOSURES
(Article 439 letter j CRR)

		a	b
€ million		Protection bought	Protection sold
Notionals			
1	Single-name credit default swaps	2,679	12,723
2	Index credit default swaps	-	-
3	Total return swaps	-	32
4	Credit options	-	-
5	Other credit derivatives	763	324
6	**Total notionals as at Dec. 31, 2022**	**3,442**	**13,079**
Fair values			
7	Positive fair values (assets)	12	181
8	Negative fair values (equity and liabilities)	-36	-63
6	Total notionals as at Jun. 30, 2022	3,241	13,912

The notionals for protection sold for exposures secured by credit derivatives declined slightly as a result of normal business activity in the DZ BANK banking group, whereas there was a moderate increase in the notionals for protection bought for exposures secured by credit derivatives.

7 Securitizations

(Article 449 CRR)

7.1 Scope, objectives, and risks of securitization

Table EU SECA – Qualitative disclosure requirements related to securitization exposures
(Article 449 letters a to i CRR)

The securitization activities of the DZ BANK banking group comprise not only funding activities in asset-backed commercial paper (ABCP) programs but also investing, trading, and funding activities involving asset-backed securities (ABSs). DZ BANK invests in high-quality ABSs to a limited extent. It also has a legacy portfolio of investment exposures dating back to the period prior to the financial crisis. As before, ABSs are held as part of trading activities in order to pass on exposures within a short period of time and funding activities are still carried out for selected customers.

As a sponsor, DZ BANK uses special-purpose entities, which are funded by issuing money market-linked ABCP. The ABCP programs are made available for DZ BANK customers who then securitize assets via these companies. In these programs, the customers sell assets to a separate special-purpose entity, the consideration normally including a purchase price reduction. The purchase of the assets is funded by issuing money market-linked ABCP and using liquidity lines of DZ BANK. The redemption of the ABCP is covered by the asset pool in the program. The contractual structure of the transactions ensures that the assets are not included in the asset seller's insolvency proceedings.

DZ BANK is deemed a sponsor of securitizations in accordance with the EU Securitization Regulation (Regulation (EU) 2017/2402 of the European Parliament and of the Council dated December 12, 2017).

The CORAL ABCP program has been set up to provide securitization of assets predominantly from European entities. This program is funded by liquidity lines and by the issuance of ABCP. DZ BANK is also the sponsor of the AUTOBAHN ABCP program, which offers securitization for assets from North American customers and is funded by ABCP issues and liquidity lines.

In addition, DZ BANK operates a program for purchasing commercial customer assets that are recognized on the balance sheet. The master agreements for this program are designed such that division of the credit risk into two or more tranches is agreed between the seller of the assets and DZ BANK at the moment that the assets are purchased.

In its investment book, DZ BANK predominantly invests in simple, transparent, and standardized (STS) securitizations. Individual ABCP transactions within the program meet the requirements for simple, transparent, and standardized ABCP securitizations.

DZ BANK's investor-related exposures are assigned to the banking book, and to a lesser extent to the trading book, and are actively managed with the aim of optimizing the portfolio, risk, and own funds.

Fig. 58 provides an overview of DZ BANK's securitization activities as sponsor in accordance with article 449 sentence 1 letter d CRR. The DZ BANK banking group no longer acts as an originator and, at the moment, does not plan to do so in the future.

FIG. 58 – SECURITIZATION EXPOSURES AS ORIGINATOR AND SPONSOR
(Article 449 letters a and d CRR)

Entity / transaction	Type of transaction	Role	Purpose of transaction	Type of assets	Volume		Retained exposures	
€ million					Dec. 31,	Dec. 31,	Dec. 31,	Dec. 31,
DZ BANK								
CORAL	ABCP conduit	Sponsor	Generation of commission income	Predominantly loans and advances to European corporates	2,878	2,477	Commitments of 2,878, of which 2,168 has been utilized	Commitments of 2,477, of which 1,113 has been utilized
AUTOBAHN				Loans and advances to North American customers	2,962	2,384	Commitments of 2,962, of which 183 has been utilized	Commitments of 2,384, of which 161 has been utilized
Purchase of assets	Purchase for the bank's balance sheet	Sponsor	Generation of commission income	Loans and advances predominantly to German customers	699	476	Commitments of 699, of which 428 has been utilized	Commitments of 476, of which 314 has been utilized

In accordance with article 449 sentence 1 letter d CRR, DZ BANK does not advise or manage any other entities that are invested in securitization exposures originated by the DZ BANK banking group or by special-purpose entities sponsored by DZ BANK.

DZ BANK also acts as a counterparty for interest-rate swaps within securitizations. To this end, DZ BANK generally enters into a receiver interest-rate swap with the special-purpose entity in order to protect the entity against interest-rate risk. The notional amount of the interest-rate swap is adjusted to the notional amount of the securitized assets on an ongoing basis. A (countervailing) payer interest-rate swap is entered into with the originator, whereby the risk of early repayment attaching to the securitized assets is transferred to the originator. With the aim of expanding the product range for the future, a decision was made in 2021 to not enter into a payer interest-rate swap with the originator in a limited number of cases. In these unilateral swaps, the risk of early repayment remains with DZ BANK. Any resulting fair value risks are monitored by the Risk Controlling division. As at the end of 2022, no such transactions had yet been entered into. DZ BANK also enters into interest-rate swaps with ABCP conduits and with upstream special-purpose entities set up by customers without an offsetting position. The notional amounts of these swaps are not adjusted on an ongoing basis.

7.2 Risk management in respect of securitizations

(Article 449 letters a and b CRR)

7.2.1 Overview

(Article 449 letters a and b CRR)

Exposures to ABSs, which constitute investor-related exposures, are managed by DZ BANK and DZ HYP and are subject to the groupwide risk management standards. One of the requirements in these standards is that securitization exposures are analyzed individually and have separate limits.

The structure of transactions is analyzed and the external credit ratings awarded by the rating agencies are validated as part of a defined process. Furthermore, all ABS asset classes at DZ BANK are subjected to an annual portfolio analysis process that assesses the macroeconomic and asset-class-specific risks involved.

Securitization exposure in the Bank sector has been reduced significantly since the beginning of the 2007 financial crisis. The volume of securitizations as at December 31, 2007 stood at €31.2 billion (fair value), whereas the exposure as at December 31, 2022 amounted to €2.0 billion (nominal amount). The vast majority of the remaining exposures are investment grade, as a result of which the extent of the monitoring was brought back down to a normal level in 2021. Correspondingly, the internal reporting system no longer includes a separate analysis of the securitization portfolio.

Securitization exposures that are not held so that they can be passed on within a short period of time are monitored regardless of whether they are assigned to the banking book or the trading book and regardless of whether DZ BANK is acting as the investor or counterparty in an interest-rate swap. There is also no differentiation between STS and non-STS securitizations. Besides continuous monitoring of external credit ratings, exposures are classified on a quarterly basis using stress tests specific to each asset class. A particular feature of the tests is that factors such as payment delays, defaults, and degree of loss are balanced against the existing credit enhancements in each transaction. If an exposure does not pass a stress test, the expected loss is determined using a model particular to the asset class concerned.

The credit risk arising in connection with the transactions in the ABCP programs and senior exposures in the asset purchase program is monitored using performance reports prepared at least monthly by the asset seller. The purchased assets are generally subject to regular due diligence in the form of random sample tests.

Re-securitizations are structures in which the securitized exposure in turn comprises one or more other securitization exposures. Re-securitization exposures are monitored in much the same way as other asset classes. Expected losses on these exposures are modeled using portfolio models from rating agencies that particularly factor in the range of ratings in the securitized portfolio and the assumptions made by the agencies with regard to the extent of losses and industry correlations. When modeling the expected losses, DZ HYP looks through the securitized portfolio. In the context of the portfolio as a whole, the re-securitization exposures and related risks are of minor significance.

The economic stress tests encompass both the credit risk and the spread risk arising from the Bank sector's entire securitization exposure.

7.2.2 Managing credit risk arising from securitizations

(Article 449 letters a and b CRR)

Credit risk in connection with securitizations in the banking book arises primarily from investments in securitizations and the provision of liquidity facilities for ABCP and senior exposures in the asset purchase program.

The liquidity facilities provided as part of the ABCP programs and senior exposures in the asset purchase program are managed in the banking book. The resulting risk largely depends on the quality of the asset pool.

7.2.3 Managing market risk arising from securitizations

(Article 449 letters a and b CRR)

For the purposes of internal management, market risk associated with securitizations (for example, interest-rate risk, spread risk, or currency risk) is included in DZ BANK's internal market risk models, regardless of whether the securitizations are posted in the banking book or the trading book. The regulatory capital requirement for general price risk is also calculated for securitizations in DZ BANK's trading book using the internal model. By contrast, DZ HYP calculates all market risk using the Standardized Approach.

At DZ BANK, the risk exposure arising from securitizations in the banking book and the trading book forms an integral part of the daily market risk report and is reflected in the values used for the weekly stress scenario calculations for market risk.

In the case of securitizations, extreme scenarios are also simulated for the weighted average lifetime and recovery assumptions. DZ HYP holds all securitizations in its banking book. They are included in the daily measurement of market risk and in reporting.

7.2.4 Managing other risk arising from securitizations

(Article 449 letters a and b CRR)

In addition to credit risk and market risk, the securitization activities of the DZ BANK banking group also give rise to liquidity risk and operational risk. These risks form an integral part of the group's standard risk management system. Disclosures related to these risks have been included in the following sections of this report:

– Liquidity risk management: section 11.2.3
– Operational risk management: section 9.3

7.2.5 Risk mitigation

(Article 449 letter a CRR)

In ABCP programs managed exclusively in the banking book, the risk arising from some of the purchased asset portfolios is covered by credit insurance in addition to the discount on the purchase price already referred to above.

As the DZ BANK banking group has no securitization exposures where it acts as originator, which means no hedging operations are necessary, this risk report does not contain any such disclosures.

7.3 Accounting policies applied to securitizations

(Article 449 letter g CRR)

7.3.1 Recognition methods

(Article 449 letter g CRR)

The accounting treatment of securitizations does not distinguish between the regulatory categories of banking book and trading book. As required by IFRS 9, the DZ BANK banking group's investor exposures are either held in the 'hold to collect' or 'hold to collect and sell' business models or held in the trading book. In general, the holding of debt instruments results in measurement at amortized cost (AC), whereas in the 'hold to collect and sell' business model it leads to measurement at fair value through other comprehensive income (FVOCI). Exercise of the fair value option and assignment to the trading book both result in measurement at fair value through profit or loss (FVTPL).

Drawn liquidity facilities are recognized as loans and advances to customers and measured at amortized cost. Purchased commercial customer assets are recognized as loans and advances to customers and measured at amortized cost. Redemptions and loss allocations during the term to maturity are recognized in accordance with the agreed division into tranches. Undrawn liquidity facilities and loan guarantees are not recognized on the balance sheet; if they give rise to any imminent risks, loss allowances are determined in accordance with IFRS 9 and recognized as provisions in the amount of the expected loss in accordance with IAS 37. Derivative instruments such as swaps that are used to hedge interest-rate or currency risks are assigned to the trading book in accordance with IFRS 9 and measured at fair value.

The special-purpose entities involved in the ABCP programs are unconsolidated structured entities. According to IFRS 10, an investor controls an entity and must consolidate the entity if the investor directs relevant activities, is exposed to variable returns from its involvement, and has the ability to affect those returns through its power over the investee. As at December 31, 2022, the DZ BANK banking group did not exercise control as defined in IFRS 10 over the special-purpose entities involved in the ABCP programs.

Legal asset sales – which are known as true-sale securitizations – are derecognized from the balance sheet to the extent that the opportunities and risks arising from the asset portfolio have been transferred to the buyer. There are currently no true-sale securitizations that have been originated by an entity in the DZ BANK banking group. Consequently, no gains on sale are recognized.

There are no liabilities arising from obligations to support securitized assets.

7.3.2 Measurement methods

(Article 449 letter i CRR)

Securitizations are measured on the basis of externally available market data. The validity of the measurement method used can be verified by regular comparison with the external market prices offered by other market participants. This ensures that an appropriate measurement method based mainly on Level 2 input data in the fair value hierarchy is used to determine the fair value of securitizations.

There are currently no exposures at DZ BANK for which securitization is planned. The valuation methods used for this purpose are therefore not presented in this report.

7.4 Regulatory treatment of securitizations

(Article 449 letters c, h, and i CRR)

7.4.1 Procedure for determining risk-weighted exposures

(Article 449 letter c CRR)

When calculating the RWEAs, DZ BANK generally uses the hierarchy of methods pursuant to article 254 (1) and (2) CRR. Because DZ BANK does not apply the Securitization Internal Ratings-based Approach (SEC-IRBA) pursuant to article 258 CRR, this hierarchy of methods specifies that first the Securitization Standardized Approach (SEC-SA) pursuant to article 261 CRR must be applied, then the Securitization External Ratings-Based Approach (SEC-ERBA) pursuant to article 263 CRR, and finally the deduction from common equity Tier 1 capital must be made. The option pursuant to article 254 (3) CRR, which permits the SEC-ERBA instead of the SEC-SA to be used for rated securitization exposures, is not used.

For exposures in ABCP programs or ABCP transactions for which no external credit ratings exist, the Internal Assessment Approach (IAA) pursuant to article 265 CRR, which has been tested and approved by the supervisory authority, was the main approach used to determine the risk-weighted exposures in connection with sponsor activities. To a lesser extent, the SEC-SA or SEC-ERBA was used in this context. Transactions that did not meet the conditions for the aforementioned measurement approaches were deducted from common equity Tier 1 capital.

In exercise of the aforementioned hierarchy of methods, investor-related exposures in the banking book were subject to the SEC-SA in the first instance, after which SEC-ERBA was applied or a deduction was made from common equity Tier 1 capital.

Pursuant to article 337 (1) CRR, it is a requirement to use the aforementioned regulatory standardized approaches to assess the specific risk of investor-related securitization positions held in the trading book.

A modified Standardized Approach is available for the correlation trading portfolio (CTP) in addition to the Standardized Approach for calculating market risk exposures (recognition of net exposure). For regulatory purposes, only securitizations and nth-to-default credit derivatives must be allocated to the CTP. Under the modified Standardized Approach, the capital requirement for the CTP is always calculated on the basis of the higher of the eligible amounts for long positions or short positions. However, only nth-to-default credit derivatives are currently allocated to the CTP.

7.4.2 External ratings
(Article 449 letter h CRR)

During its securitization activities, the DZ BANK banking group uses the classifications prescribed by the rating agencies Standard & Poor's, Moody's, and Fitch for rating the regulatory asset classes listed below:

- Receivables from residential real estate loans
- Purchased lease receivables (retail and commercial)
- Other receivables from retail loans
- Receivables from loans on wholly or partially commercial real estate
- Other receivables from corporates, e.g. from corporate loans

External credit ratings awarded by these recognized rating agencies are applied to the securitization exposures of the DZ BANK banking group in accordance with the requirements of articles 270b and 270c CRR. Competing external ratings are included in the calculation of risk-weighted exposures in accordance with article 270d CRR. Section 6.1.3 of this report shows a reconciliation of external and internal ratings, while Fig. 59 below shows a reconciliation of external and internal ratings for ABSs.

FIG. 59 – RECONCILIATION OF EXTERNAL AND INTERNAL ABS RATINGS[1]
(Article 449 letter i CRR)

		Asset class					
External rating							
S&P / Fitch	Moody's	ABSs	US RMBSs	Non-US RMBSs	CMBSs	CLOs	CDOs (excl. CLOs)
AAA	Aaa	1A	2D	1A	2B	1C	3D
AA+	Aa1	1A	2E	1A	2C	1E	3D
AA	Aa2	1B	3B	1B	2C	2B	3D
AA–	Aa3	1C	3B	1C	2D	2C	3D
A+	A1	1E	3B	1D	2E	2C	3E
A	A2	2A	3C	1E	3A	2D	3E
A-	A3	2B	3D	2A	3B	2E	3E
BBB+	Baa1	2C	3D	2B	3C	3A	4A
BBB	Baa2	2D	3E	2C	3D	3B	4A
BBB-	Baa3	2E	4A	2D	3E	3C	4A
BB+	Ba1	3A	4A	2E	4A	3D	4A
BB	Ba2	3A	4B	3A	4B	3E	4A
BB-	Ba3	3B	4C	3B	4C	4A	4A
B+	B1	3C	4D	3D	4C	4B	4A
B	B2	3E	4D	3E	4D	4C	4B
B-	B3	4A	4E	4B	4E	4D	4B
CCC+ or lower	Caa1	4D	4E	4E	4E	4E	4C
unrated, no default		4E	4E	4E	4E	4E	4E

[1] The internal credit ratings of the exposures in DZ BANK's internal ABS portfolio are reconciled to the external credit ratings from S&P, Fitch, and Moody's using this credit rating reconciliation table.

7.4.3 Internal ratings

(Article 449 letter i CRR)

The Internal Assessment Approach (IAA) (in accordance with article 265 CRR for new business) is used to determine ratings for liquidity facilities and swaps provided for ABCP programs if such facilities have not been rated by external agencies. This arrangement relates solely to the banking book because the entities in the DZ BANK banking group do not have any such exposures in the trading book.

When used to assess risk in accordance with regulatory requirements, the IAA closely follows the models used by external rating agencies. Depending on the assets securitized in an ABCP transaction, one of a number of submodels within the Internal Assessment Approach (IAA) (in accordance with article 265 CRR for new business) may be used to ensure that the measurement is appropriate to the risk. Lease receivables, trade receivables, and other items are securitized. In compliance with article 265 CRR, the stress factors used to measure the relevant cushions against potential loss and the resulting rating categories are at least as conservative as those used by external rating agencies. The stress factors used for determining internal ratings are used in a similar way by the rating agencies in their procedures. In addition, the IAA is used for portfolios of individually assessed loans and advances. Likewise, the resulting credit ratings in this case are no less conservative than would be expected from the use of credit portfolio models by external rating agencies. Besides being used for determining capital requirements, the IAA is also used for the purposes of internal risk management and pricing.

The IAA is comprehensively validated each year. The employees responsible for this task receive extensive training and are familiar with current developments relating to the area of securitization. Suitable organizational structures are in place to ensure that front office, back office, model development, and model validation are segregated. Credit procedures and rating models are also subject to regular review by both internal and external auditors.

7.5 Securitization exposure and capital requirements

(Article 449 sentence 1 letter k (i) CRR)

7.5.1 Total amount of asset securitizations

(Article 449 sentence 1 letter j CRR)

There are no longer any activities with the DZ BANK banking group as originator. Furthermore, there were no true-sale securitizations in the banking book, neither were there any securitizations of assets associated with market risk exposures in the trading book.

The year-on-year change in sponsor exposures was largely due to new transactions and the expansion of exposures.

7.5.2 Impaired securitizations, past-due securitized loans, and losses realized during the reporting period

(Article 449 sentence 1 letter l CRR)

As there are no longer any activities with the DZ BANK banking group as originator, no disclosures on the portions of the group's own asset securitizations that are past due or at risk of default are provided, nor are the losses on such exposures realized during the reporting year presented.

7.5.3 Securitizations during the reporting period

(Article 449 sentence 1 letter j CRR)

No assets were effectively securitized with the DZ BANK banking group as originator during 2022. There are still no securitization structures with an early amortization approach.

In the reporting period, the DZ BANK banking group did not provide any implicit support within the meaning of article 250 CRR.

7.5.4 Retained, purchased or off-balance-sheet securitization exposures

(Article 449 sentence 1 letter j CRR)

Fig. 60 and Fig. 61 show the securitization exposures in the banking book and trading book, indicating the DZ BANK banking group's role in respect of the securitization exposures (originator, sponsor, or investor).

FIG. 60 – EU SEC1 – SECURITIZATION EXPOSURES IN THE BANKING BOOK
(Article 449 sentence 1 letter j CRR)

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
		Institution acts as originator							Institution acts as sponsor				Institution acts as investor			
		Traditional				Synthetic			Traditional				Traditional			
		STS		Non-STS												
	€ million		of which: SRT		of which: SRT		of which: significant risk transfer (SRT)	Subtotal	STS	Non-STS	Synthetic	Subtotal	STS	Non-STS	Synthetic	Subtotal
1	**Total exposure as at Dec. 31, 2022**	-	-	-	-	-	-	-	1,100	5,110	-	6,210	898	1,139	-	2,037
2	**Retail business (total)**	-	-	-	-	-	-	-	-	4,423	-	4,423	215	836	-	1,051
3	Residential mortgages	-	-	-	-	-	-	-	-	-	-	-	214	591	-	805
4	Credit cards	-	-	-	-	-	-	-	-	3,341	-	3,341	-	237	-	237
5	Other retail exposures	-	-	-	-	-	-	-	-	1,082	-	1,082	1	8	-	9
6	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	**Wholesale (total)**	-	-	-	-	-	-	-	1,100	687	-	1,787	683	303	-	986
8	Loans to corporates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Commercial mortgages	-	-	-	-	-	-	-	-	-	-	-	-	34	-	34
10	Leases and receivables	-	-	-	-	-	-	-	1,100	687	-	1,787	419	81	-	500
11	Other wholesale	-	-	-	-	-	-	-	-	-	-	-	264	188	-	452
12	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Total exposure as at Jun. 30, 2022	-	-	-	-	-	-	-	1,056	4,229	-	5,285	862	1,906	-	2,767

As at the reporting date, the securitization portfolio in the banking book had changed only moderately compared with June 30, 2022 due to two opposing effects. On the one hand, there was an increase in sponsor activities and, on the other, the investor portfolio contracted due to redemptions, primarily in the portfolios of DZ BANK and DZ HYP.

FIG. 61 – EU SEC2 – SECURITIZATION EXPOSURES IN THE TRADING BOOK
(Article 449 sentence 1 letter j CRR)

		a	b	c	d	e	f	g	h	i	j	k	l
		Institution acts as originator				Institution acts as sponsor				Institution acts as investor			
		Traditional				Traditional				Traditional			
	€ million	STS	Non-STS	Synthetic	Subtotal	STS	Non-STS	Synthetic	Subtotal	STS	Non-STS	Synthetic	Subtotal
1	**Total exposure as at Dec. 31, 2022**	-	-	-	-	-	-	-	-	8	200	-	208
2	**Retail business (total)**	-	-	-	-	-	-	-	-	-	196	-	196
3	Residential mortgages	-	-	-	-	-	-	-	-	-	54	-	54
4	Credit cards	-	-	-	-	-	-	-	-	-	134	-	134
5	Other retail exposures	-	-	-	-	-	-	-	-	-	8	-	8
6	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-
7	**Wholesale (total)**	-	-	-	-	-	-	-	-	8	4	-	12
8	Loans to corporates	-	-	-	-	-	-	-	-	-	-	-	-
9	Commercial mortgages	-	-	-	-	-	-	-	-	-	-	-	-
10	Leases and receivables	-	-	-	-	-	-	-	-	8	0	-	8
11	Other wholesale	-	-	-	-	-	-	-	-	0	4	-	4
12	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-
1	Total exposure as at Jun. 30, 2022	-	-	-	-	-	-	-	-	72	554	-	626

As at the reporting date, the securitization portfolio in the trading book had contracted compared with June 30, 2022 due to normal fluctuation in the markets.

7.5.5 Exposure values and capital requirements for retained or purchased securitizations broken down by the approach used to calculate the capital requirement

(Article 449 sentence 1 letter k (i) CRR)

Fig. 62 shows the securitization exposures in the banking book and the related regulatory capital requirements where the institution acts as originator or sponsor.

Disclosure of the quantitative information about using the Securitization Standardized Approach is in line with article 444 letter e CRR.

7.5.6 Securitization exposures and deductions from own funds

(Article 449 sentence 1 letter k (i) CRR)

FIG. 62 – EU SEC3 – SECURITIZATION EXPOSURES IN THE BANKING BOOK AND ASSOCIATED REGULATORY CAPITAL REQUIREMENTS – INSTITUTION ACTING AS ORIGINATOR OR AS SPONSOR
(Article 449 sentence 1 letter k (i) CRR)

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	EU-p	EU-q
		Exposure values (by risk weight (RW) bands/deductions)					Exposure values (by regulatory approach)				RWEA (by regulatory approach)				Capital charge after cap			
	€ million	≤20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1,250% RW	1,250% RW/ deductions	SEC-IRBA	SEC-ERBA (including IAA)	SEC-SA	1,250% RW/ deductions	SEC-IRBA	SEC-ERBA (including IAA)	SEC-SA	1,250% RW/ deductions	SEC-IRBA	SEC-ERBA (including IAA)	SEC-SA	1,250% RW/ deductions
1	**Total exposure as at Dec. 31, 2022**	**1,037**	**1,891**	**3,025**	**257**	-	-	**5,411**	**799**	-	-	**3,234**	**652**	-	-	**259**	**52**	-
2	**Traditional transactions**	**1,037**	**1,891**	**3,025**	**257**	-	-	**5,411**	**799**	-	-	**3,234**	**652**	-	-	**259**	**52**	-
3	Securitizations	1,037	1,891	3,025	257	-	-	5,411	799	-	-	3,234	652	-	-	259	52	-
4	Retail business	1,037	492	2,646	248	-	-	3,624	799	-	-	2,408	652	-	-	193	52	-
5	of which: STS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Wholesale	-	1,399	379	9	-	-	1,787	-	-	-	826	-	-	-	66	-	-
7	of which: STS	-	1,100	-	-	-	-	1,100	-	-	-	387	-	-	-	31	-	-
8	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	**Synthetic transactions**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Retail business	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Wholesale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Total exposure as at Jun. 30, 2022	64	1,687	2,810	724	-	-	5,285	-	-	-	3,171	-	-	-	254	-	-

As at the reporting date, the exposures for sponsor activities had increased compared with June 30, 2022 due to new business. They are primarily calculated using the IAA. A portfolio of purchased receivables is also shown under the Standardized Approach (SEC-SA). The DZ BANK banking group does not use the Securitization Internal Ratings-based Approach (SEC-IRBA). There was a rise in the RWEA for this portfolio owing to new business. There were no capital deductions as at the reporting date.

The figure below shows the securitization exposures in the banking book and the related regulatory capital requirements where the institution acts as investor.

FIG. 63 – EU SEC4 – SECURITIZATION EXPOSURES IN THE BANKING BOOK AND ASSOCIATED REGULATORY CAPITAL REQUIREMENTS – INSTITUTION ACTING AS INVESTOR
(Article 449 sentence 1 letter k (ii) CRR)

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	EU-p	EU-q
		Exposure values (by risk weight (RW) bands/deductions)					Exposure values (by regulatory approach)				RWEA (by regulatory approach)				Capital charge after cap			
	€ million	≤20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1,250% RW	1,250% RW/ deductions	SEC-IRBA	SEC-ERBA (including IAA)	SEC-SA	1,250% RW/ deductions	SEC-IRBA	SEC-ERBA (including IAA)	SEC-SA	1,250% RW/ deductions	SEC-IRBA	SEC-ERBA (including IAA)	SEC-SA	1,250% RW/ deductions
1	**Total exposure as at Dec. 31, 2022**	**1,381**	**194**	**294**	**149**	**19**	**-**	**1,604**	**414**	**19**	**-**	**695**	**102**	**-**	**-**	**56**	**8**	**-**
2	**Traditional securitizations**	**1,381**	**194**	**294**	**149**	**19**	**-**	**1,604**	**414**	**19**	**-**	**695**	**102**	**-**	**-**	**56**	**8**	**-**
3	Securitizations	1,381	194	294	149	19	-	1,604	414	19	-	695	102	-	-	56	8	-
4	Retail business	453	170	293	115	19	-	820	212	19	-	549	80	-	-	44	6	-
5	of which: STS	195	20	-	-	-	-	157	58	-	-	16	9	-	-	1	1	-
6	Wholesale	928	24	0	34	-	-	784	201	-	-	146	22	-	-	12	2	-
7	of which: STS	659	24	0	0	-	-	513	170	-	-	59	17	-	-	5	1	-
8	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	**Synthetic securitizations**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
10	Securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Retail business	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Wholesale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Re-securitizations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Total exposure as at Jun. 30, 2022	1,661	427	321	343	15	-	1,353	1,414	-	-	525	837	-	-	42	67	-

As at the reporting date, the investor portfolio had contracted compared with June 30, 2022 due to changes to the portfolio and sales. This resulted in a fall in the RWEAs. The External Ratings-based Approach (SEC-ERBA) and the Standardized Approach (SEC-SA) are the main approaches used. Here too, the SEC-IRBA is not used.

Template EU SEC5 is not relevant because the DZ BANK banking group does not currently act as an originator.

7.5.7 Re-securitization exposures and collateralization amounts

(Article 449 sentence 1 letter a CRR)

No re-securitization exposures were held as at December 31, 2022.

7.5.8 Planned securitizations

(Article 449 sentence 1 letter a CRR)

As at December 31, 2022, there were no plans for any securitizations.

8 Market risk

(Article 445, article 448, article 455, article 435 (1), and article 438 sentence 1 letter h CRR)

8.1 Definition

(Article 435 (1) CRR)

Market risk in the Bank sector comprises market risk in the narrow sense of the term, and market liquidity risk.

Market risk in the narrow sense of the term – referred to below as market risk – is the risk of loss arising from adverse movements in market prices or in the parameters that influence prices. Market risk encompasses a number of risk subtypes, including interest-rate risk (interest-rate risk in the banking book, interest-rate risk in the trading book), spread risk (constantly monitored component) and migration risk (as intermittent spread risk), currency risk, equity risk, fund price risk, commodity risk, and asset-management risk. Parameters that determine market risk also include a category of risk factors referred to as 'opaque'. These risk factors are parameters that are relevant to measurement but cannot be directly observed and must therefore be derived from quoted market prices using models. For the purposes of measuring and managing risk, market risk is broken down into spread and migration risk, asset-management risk, and general market risk, the last of which encompasses all the other risk subtypes.

Market liquidity risk is the risk of losses that could arise from adverse changes in market liquidity – for example, because of market disruption or a reduction in market depth – such that assets can only be liquidated in markets if they are discounted and that it is only possible to carry out active risk management on a limited basis.

8.2 Market risk management

Table EU MRA: Qualitative disclosure requirements related to market risk
(Article 435 (1) letters a to d CRR)

8.2.1 Business background and risk strategy

(Article 435 (1) letter a CRR)

Business background

The DZ BANK banking group is exposed to considerable market risk. Market risk arises mainly in connection with BSH, DZ HYP, and UMH in addition to DZ BANK. The assumption of market risk by these entities in the Bank sector is primarily attributable to the DZ BANK Group's strategic focus on the cooperative financial network. This strategy means that each entity in the DZ BANK Group specializes in certain types of product with a corresponding impact on the respective entity's risk profile.

Market risk arises in the Bank sector mainly as a consequence of the following business activities:

– DZ BANK: own trading activities; traditional lending business with non-retail customers
– BSH: traditional lending business; building society operations aimed at financing privately owned real estate; securities portfolios
– DZ HYP: financing for real estate and local authorities; portfolios of securities held to manage liquidity and cover assets
– UMH: own-account investing activities; guarantee obligations to customers contained in Riester fund-linked savings plans and guarantee funds

Liabilities and – where present in a group entity – assets related to direct pension commitments are a further source of market risk. Market liquidity risk arises primarily in connection with securities already held in the portfolio as well as funding and money market business.

Risk strategy

The following principles for managing market risk apply to the entities in the **Bank sector**:

- Market risk is only taken on to the extent that it is necessary to facilitate attainment of business policy objectives.
- The assumption of market risk is only permitted within the existing limits.
- Statutory restrictions, provisions in the Articles of Association, or other limitations enshrined in the risk strategy that prohibit the assumption of certain types of market risk for individual management units are observed.

The entities in the Bank sector pursue the following strategies in relation to the individual **types of market risk**:

- Spread and migration risk is assumed.
- Interest-rate risk associated with the original business purpose of the management units is kept within defined limits.
- In contrast, interest-rate risk from pension obligations is accepted and included in the calculation of risk-bearing capacity.
- Virtually all currency risk is eliminated.
- Commodity risk is assumed only to a very small degree.

Market liquidity risk is consciously assumed following an analysis that takes into account the prevailing liquidity.

8.2.2 Management of market risk

(Article 435 (1) letters b, c, and d CRR)

DZ BANK generally manages market risk on a decentralized, portfolio basis. The traders responsible for managing a portfolio bear responsibility for its risk and performance.

Central market risk measurement in the overall portfolio

Various components are used to quantify market risk in the Bank sector from a present value perspective. These components are combined to determine the aggregate risk capital requirement for market risk, taking into account the effects of concentration and diversification. The risks arising in connection with the assets and liabilities associated with direct pension commitments are also factored in. The models are operated centrally by DZ BANK and are fed with input data provided by the management units on each trading day. Sector-wide standards and rules ensure that the modeling is appropriate.

The first component of the measurement approach creates a spread and migration risk model based on a **Monte Carlo simulation**. It determines the combined spread and migration risk over a longer-term (strategic) horizon of one year with a confidence level of 99.9 percent. Whereas spread risk quantifies credit-risk-related losses from financial instruments in a short-term view of value-at-risk, this becomes the combined spread and migration risk in the risk capital requirement over a longer-term perspective.

The second component is a value-at-risk model based on a **historical simulation** in which the general market risk is determined from a short-term (operational) perspective over 1 day and with a unilateral confidence level of 99.0 percent. The model calculated day by day is based on a historical observation period of 250 trading days and includes a number of risk factors. The most important risk factor groups include yield curves, basis and credit spreads, share prices, exchange rates, and commodity prices. The model also includes implied volatility in the risk measurement.

Drawing on the results of the value-at-risk measurement, a transformation model turns the operational key risk indicators (also taking account of stress events) into a strategic perspective in which a one-year holding period and a confidence level of 99.90 percent are assumed.

In the last step, the results from the spread and migration risk model and from the transformation model are then combined to give the **aggregate risk capital requirement** for market risk.

Central market risk measurement for interest-rate risk in the banking book

For internal sector-wide management purposes, the banking book and trading book are treated in the same way in terms of the models and key risk indicators used, the frequency of risk measurement, and the main risk measurement parameters. To supplement this risk measurement approach in which the banking and trading books are analyzed holistically, interest-rate risk in the banking books of the entities in the Bank sector from a regulatory perspective is managed separately using a present-value approach.

On behalf of the other management units in the Bank sector, DZ BANK also operates a partially centralized model for quantifying periodic interest-rate risk. Overall, these methods are used to record the impact from changes in interest rates, both from an economic perspective (based on present value) and from the angle of net interest income.

Concentrations of market risk

Concentrations in the portfolio affected by market risk are identified by classifying the exposure in accordance with the risk factors associated with interest rates, spreads, migration, equities, currencies, and commodities. This incorporates the effects of correlation between these different risk factors, particularly in stress phases.

Decentralized measurement of general market risk and spread risk

The main **management units** operate their own risk models to satisfy ICAAP requirements from the perspective of the individual institution. With the exception of asset-management risk at UMH, the results from these models are not used to manage market risk on a present value basis in the Bank sector and therefore do not form part of this risk report.

Decentralized measurement of asset-management risk

The risk capital requirement for asset-management risk is determined locally by UMH and then added to the risk capital requirement for general market risk and spread risk calculated centrally for the Bank sector. Following the approach used for the central measurement of market risk, the risk capital requirement for asset-management risk is calculated using a one-year holding period and a confidence level of 99.9 percent. The risk calculation makes a distinction between guarantee fund and Riester pension products. In the case of the Riester pension product, which is the most significant product in terms of risk capital requirement, the measurement of the risk is based on a Monte Carlo simulation, taking into account the specific investment selections made in the customer investment account.

Management of spread risk and migration risk

Most of the spread and migration risk in the **Bank sector** arises from non-trading portfolios and is consciously assumed within the established limits in accordance with the associated long-term investment strategy. Hedging instruments are also used in carefully selected trading book portfolios. The central measurement of this risk means that the level of the risk on every trading day is transparent. If there is any indication that the ability to bear the spread and migration risk is in jeopardy, Group Treasury at DZ BANK will initiate corrective measures across the sector.

Management of interest-rate risk

Interest-rate risk arising from operating activities at **DZ BANK** and **DZ HYP** is mitigated primarily by means of hedging using interest-rate derivatives, on the basis of either individual transactions or portfolios. At

BSH, an asset/liability management approach based on the maturities of the securities in the investment portfolio is the predominant method used to manage interest-rate risk arising from the collective building society operations and the traditional lending business, including the interest-rate risk associated with direct pension commitments. Interest-rate derivatives are of minor significance.

DZ BANK is notably exposed to significant **interest-rate risk from direct pension commitments** in addition to the interest-rate risk arising from operating activities. This risk is consciously assumed within the existing limits.

Management of equity risk and fund price risk

Equity risk and fund price risk from the non-trading portfolios are managed first and foremost by directly changing the underlying exposure. Derivative products are also used within the trading portfolios to keep the type of risk involved within the allocated limits. Some funds are broken down into their constituent parts for the purposes of measuring the risk. In such cases, the risk is not treated as part of fund price risk, but is managed within the type of market risk determined for the constituent part concerned.

Management of asset-management risk

Asset-management risk arises from minimum payment commitments given by UMH and/or its subsidiaries for guarantee products. The risks from these guarantee products are managed mainly by using asset allocation. Asset-management risk is reported using a separate internal system and is monitored regularly by UMH.

Management of market liquidity risk

The calculation of general market risk in the Bank sector using the transformation model and the spread and migration risk model takes market liquidity risk into account.

Within the transformation model, stress events are expressly integrated into the analysis when market risk is transferred from an operating perspective to a strategic perspective. The change in risk factors in these events is based on the assumption that it is not possible to make changes to the exposures in the portfolio of the Bank sector over a specified period.

The spread and migration risk model implicitly factors in phases of diminishing market liquidity via the calibration of the credit spread volatility included in the model. The estimation of volatility based on market data from the recent past also uses a lower limit determined from longer-term data. This prevents any low level of credit spread volatility in a calm market environment with normal market liquidity from being transferred directly into the model parameters.

Backtesting and stress tests

The central value-at-risk model is subject to **backtesting**, the purpose of which is to verify the predictive quality of the model. Changes in the value of portfolios on each trading day are usually compared against the value-at-risk calculated using risk modeling.

Risks arising from extreme market situations are primarily recorded using stress tests. The crisis scenarios underlying the stress tests include the simulation of significant fluctuations in risk factors and serve to highlight potential losses not generally recognized in the value-at-risk approach. Stress tests are based on extreme market fluctuations that have actually occurred in the past together with crisis scenarios that – regardless of market data history – are considered to be economically relevant. The crisis scenarios used in this case are regularly reviewed to ensure they are appropriate. The following are deemed to be risk factors: interest-rate risk, spread risk, migration risk, equity risk, currency risk, and commodity risk.

Management of limits for market risk

The starting point for limiting market risk is a limit for the capital requirement for market risk in the **Bank sector** specified as part of operational planning. This limit is broken down into an individual limit for the market risk capital requirement in each management unit.

Within **DZ BANK**, this limit is then further subdivided into a system of limits for the divisions, departments, and groups to appropriately reflect the decentralized portfolio responsibility assigned to these units and the nature of the bank from a regulatory perspective as a trading book institution. Limits are monitored on every trading day.

Mitigating market risk

The entities in the Bank sector use various approaches to mitigate market risk. For example, some market risk from the assets-side business (such as traditional lending business) or from the liabilities-side business (such as home savings deposits) is offset by suitable countervailing liability or asset transactions (such as own issues or securities). These activities are carried out as part of asset/liability management. In other cases, financial derivatives are used for hedging purposes.

As the measurement of market risk is based on the inclusion of the individual items subject to market risk, there is no need to monitor the economic effectiveness of hedges.

8.2.3 Organization, responsibility, and reporting

(Article 435 (1) letters b and c CRR)

Market risk in the **Bank sector** is managed on a decentralized basis by the individual management units within the centrally specified limits for the capital requirement for market risk. Each unit bears responsibility for the risk and performance associated with each portfolio. Responsibility for managing risk within a management unit is normally brought together under a local treasury unit.

One exception is **DZ BANK**, where portfolios are managed at the level of subordinate organizational units (group, department, division). In this case, the relevant traders bear direct responsibility for risk and performance. The organizational units are structured in such a way that the responsibility for the marketing of certain types of product is assigned in each case to a trading division with product responsibility.

Key figures for market risk are reported at sector level and for DZ BANK to the Group Risk and Finance Committee in the quarterly overall risk report.

8.3 Further required qualitative disclosures on market risk

(Article 455 letter c CRR in conjunction with Implementing Regulation (EU) 2021/637 table EU MRB rows EU (a) and EU (b))

For regulatory purposes, DZ BANK is classed as a trading book institution. It conducts trading activities as part of its role as the central institution in the cooperative financial network and – on this basis – as a corporate bank for customers outside the cooperative financial network.

In line with the requirements in articles 102 to 104 CRR, DZ BANK has defined clear rules on the delimitation and the running and management of the trading book. The trading book is defined using criteria relating to the intention to trade and generate returns, maturities, tradability, the ability to mitigate risk, and the characteristics of the financial instruments. A clear decision-making path for the assignment of an exposure to either the trading book or the banking book is also mandatory.

When a transaction is entered into, its purpose must be documented in a verifiable manner by recognizing it in a specific portfolio – trading book or banking book – so that it is clearly assigned. Compliance with the assignment rules is regularly monitored within a defined process. The assignment to the trading book or banking book can only be changed subsequently in accordance with defined rules as part of a reallocation process.

The handling of risk in the trading book is documented in DZ BANK's trading strategy. The rules for running and managing the trading book, the definition of the trading book, and the trading strategy are reviewed and, if necessary, updated at least once a year.

Exposures in the trading book are, where available, measured daily using liquid market prices available in active markets (mark-to-market). These exposures are mainly liquid securities (bonds and equities) and exchange-traded derivatives. If there are no liquid market prices available, the exposures are measured with market-standard valuation models using predominantly observable market data (mark-to-model). Calibration of the valuation models on the basis of observable market data ensures that measurement reflects the market. The extent of unobservable market parameters that influence value is always kept as small as possible in the measurement. Generally, unobservable market parameters are derived from similar instruments or data that is not observable on a daily basis. As a rule, they are included in the calculation of gains and losses with an adjustment to the instrument's measurement that is appropriate to the degree of imprecision in the measurement.

Pursuant to articles 34 and 105 CRR and Delegated Regulation (EU) 2016/101, DZ BANK calculates regulatory write-downs for all exposures recognized at fair value in accordance with the core approach and deducts them from common equity Tier 1 capital. Measurement is based on the methods and models used to measure fair value under commercial law; measurement uncertainties relating to market prices, market parameters, and model selection are reflected by taking the 90 percent quantile into account. Additional write-downs for operational risk, future administrative expenses, and exposure concentrations are recognized in accordance with the prescribed methodology and deducted from Tier 1 capital.

8.4 Market risk under the Standardized Approach

(Article 445 CRR)

Fig. 64 contains disclosures on the risk-weighted exposure amounts for market risk under the Standardized Approach. The RWEAs for specific interest-rate risk relating to securitization exposures pursuant to article 445 sentence 2 CRR are also disclosed here. As at December 31, 2022, the proportion of market risk-weighted assets subject to the Standardized Approach was 7.29 percent (June 30, 2022: 7.77 percent).

FIG. 64 – EU MR1 – MARKET RISK UNDER THE STANDARDIZED APPROACH
(Article 445 CRR)

		Dec. 31, 2022	Jun. 30, 2022
		a	a
€ million		Risk-weighted exposure amounts (RWEAs)	Risk-weighted exposure amounts (RWEAs)
	Outright products		
1	Interest-rate risk (general and specific)	6	28
2	Equity risk (general and specific)	-	1
3	Currency risk	428	563
4	Commodity risk	14	11
	Options		
5	Simplified approach	-	-
6	Delta-plus approach	-	-
7	Scenario approach	-	-
8	Securitization (specific risk)	89	185
9	**Total**	**537**	**788**

Market risk under the Standardized Approach was down compared with June 30, 2022. The decrease of €252 million was due to normal fluctuation in the markets. The dominant risk categories are currency risk and specific securitization risk.

8.5 Internal market risk model

8.5.1 Qualitative information on the internal market risk model

Table EU MRB: Qualitative disclosure requirements for institutions using the internal market risk models
(Article 455 sentence 1 letters a, b, c, and f CRR)

The model approved by BaFin for calculating the regulatory capital requirements for general and specific market risk pursuant to the CRR is used for all portfolios of DZ BANK.

DZ BANK's internal model approved by BaFin for calculating the regulatory capital requirements for general and specific market risk pursuant to the CRR is used to calculate **value-at-risk** and **stressed value-at-risk** (potential risk in stress conditions) on a daily basis with a unilateral confidence level of 99.00 percent over a one-year observation period and a holding period of 10 trading days. A historical simulation is used to generate market data scenarios.

Description of the crisis scenarios used

Risks arising from extreme market situations are primarily recorded using **stress tests**. The crisis scenarios underlying the market risk stress tests include the simulation of significant fluctuations in risk factors and serve to highlight potential losses not generally recognized in the value-at-risk approach. Stress tests are based on extreme market fluctuations that have actually occurred in the past together with crisis scenarios that – regardless of market data history – are considered to be relevant. The crisis scenarios used in this case are constantly reviewed and updated to ensure they are appropriate. Reverse stress tests are also used to identify scenarios that could pose a potential threat to the institution.

Qualitative information about stress tests and information about which portfolios undergo stress tests

Risks arising from extreme market situations are primarily recorded using stress tests. The crisis scenarios underlying the market risk stress tests include the simulation of significant fluctuations in risk factors and serve to highlight potential losses not generally recognized in the value-at-risk approach. Extreme market fluctuations that have actually occurred in the past as a result of crisis events (e.g. September 11, 2001, Lehman insolvency, coronavirus crisis in March 2020) are used for historical stress test scenarios; crisis scenarios are also devised in which individual risk factor groups are exposed to strong hypothetical fluctuation, regardless of market data history. All portfolios of DZ BANK are remeasured in full in respect of all scenarios, taking account of any relevant changes in the risk factors. The crisis scenarios used in this case are constantly reviewed and updated to ensure they are appropriate. Reverse stress tests are also used to identify scenarios that could pose a potential threat to the institution. Changes in the risk factors are determined that would generate losses above a previously defined threshold in the event of a DZ BANK portfolio being remeasured in full.

Additional default and migration risk (incremental risk charge)

Since December 2011, DZ BANK has been using an internal risk model approved by the supervisory authority to determine the capital requirements related to the additional default and migration risk in the trading book (incremental risk charge, IRC). In this model, sudden market changes arising from rating migrations or default by an issuer are specifically factored into the regulatory risk calculation. Potential losses from migrations and defaults are measured on the basis of a one-sided prediction interval with a confidence level of 99.90 percent and a prediction horizon of one year. A factor-based portfolio model is used. Calculations assume a constant risk position over the prediction horizon.

Measurement undertaken independently of the trading function, and model validation

Independently of the trading function, exposures are measured daily using current market parameters. To this end, the market data is largely collected by Risk Controlling itself and the measurement methods and models are developed largely independently of the trading units and validated entirely independently. An independent price verification process takes place where market parameters are not used independently of the trading function. Any discrepancies identified through comparison with data from external suppliers of market data are recognized as a valuation reserve.

The internal market risk model is subject to continuous operational review as part of standard processes. The review is carried out by market risk control using analyses of the value-at-risk and evaluations of the backtesting and stress test results.

An enhanced review of the model (appropriateness test) is carried out at least once a year. It includes a comprehensive analysis of time series, parameterization, stress test scenarios, processes, and a review of the time period for calculating the stressed value-at-risk. As part of the annual appropriateness test, statistical tests are carried out on the predictive quality of the value-at-risk model and procedural aspects are taken into account, such as delivery times and the quality of the value-at-risk figure.

Market risk model validation consists of five key components: daily risk analysis, daily backtesting, monthly validation, risk self-assessment, and the annual appropriateness test.

Validation governance stipulates that the results of the daily risk analysis and backtesting are used to compile a monthly validation report, with additional analysis and validation as required, and communicated to the Board of Managing Directors.

The annual appropriateness test also includes an assessment of the processes connected with the preparation of key risk indicators, analysis of the stress tests implemented, statistical tests to check the predictive quality of the risk model, and portfolio-level examination of anomalies.

The risk self-assessment is carried out once a year, or whenever required, with the aim of creating a standard, structured list of known failings in the market risk model, setting logical validation priorities, and defining and monitoring improvement measures.

In addition, the internal market risk model is examined by internal audit during annual audits.

Required disclosures on the use of value-at-risk (VaR) models and stressed value-at-risk (sVaR) models

Within the DZ BANK banking group, only DZ BANK has a **market risk model** that has been approved by the supervisory authority. The other entities use the **Standardized Approach**.

Portfolio and market data is updated each trading day. Risk is measured using a historical simulation for a 250-day, equally weighted review period. In the context of risk measurement, financial instruments are mostly remeasured in full.

The **VaR model** used for regulatory purposes is also used for internal management, largely using the same methods and processes. The only differences in the VaR model used for internal management are as follows:

– The holding period used is shorter (1 day, 99 percent quantile).
– All asset classes are taken into account, including in the banking book.
– Separate equity event risk is ignored.
– Differences may arise in relation to add-ons or buffers for risks that are not contained in the model.

Risk factor changes are directly derived from 10-day changes observed in the past.

An integrated view of the general and specific risk factors is taken in the historical scenarios.

Risk factors are generally varied on a relative basis unless it is acceptable to assume negative values. That is why all interest-rate and spread risk factors, in particular, are varied on an absolute basis.

The sVaR model uses the same methods and processes as the VaR model. Only the historical market data from the stress period is fed into the sVaR model. The stress period was adjusted in the first quarter of 2021 owing to strong fluctuation in the markets triggered by the coronavirus crisis. Since then, the period January 2, 2020 to December 30, 2020 has been used as the stress period. The stress period is reviewed in the first quarter of each year using a complete historical simulation from October 2007 to the review date in question.

Required disclosures on the use of an IRC model for determining the capital requirement

To determine the additional default and migration risk (IRC), a portfolio model is used in which credit rating changes are determined depending on systematic risk factors and using credit rating transition matrices. The credit rating transition matrices, the factor weightings, and the correlations between the systematic risk factors are derived from detailed data supplied by the major rating agencies on migrations and defaults and using established procedures. A constant risk position up to the prediction horizon of one year is assumed, i.e. no individual liquidity horizon is required. The modeling covers DZ BANK's entire trading book, although securitizations and the CTP are explicitly excluded. The risk measure is the gain and loss distribution of the value-at-risk generated by the model with a confidence level of 99.9 percent.

An extensive program of stress testing is regularly conducted for the model. The stress tests include, but are not limited to, analysis of concentration risk, the correlation parameters, and credit rating transition matrices as well as macroeconomic scenarios and their impact on additional default and migration risk.

An annual appropriateness test is conducted on the model for determining the additional default and migration risk. The main aspects covered by this test are as follows:

– Adequacy of the model design and numerical procedures used
– Influence of single borrower concentrations and systematic risk concentrations

- Appropriateness of the correlation assumptions, the credit rating transition matrices, and the modeling of recovery risk
- Analysis of the stress tests implemented
- Quality of the processes relating to risk reporting
- Appropriateness of the model documentation and compliance with the regulatory requirements

Required disclosures on the use of internal models for correlation activities for determining the capital requirement

The DZ BANK banking group does not use internal models for correlation activities for determining the capital requirement.

8.5.2 Quantitative information on the internal market risk model

(Article 455 sentence 1 letters d, e, and g and article 438 sentence 1 letter h CRR)

The capital requirement for market risk at DZ BANK is determined using the internal market risk model described in section 8.5.1. This is based on a historical simulation with a holding period of 10 trading days and an observation period of one year; the following risk factor classes are examined for all subportfolios of DZ BANK: interest rates, spreads, equities, foreign currencies, and commodities.

Fig. 65 shows the components of the capital requirement under the internal model approach for market risk.

As at the reporting date, the proportion of market risk-weighted assets covered by the internal model was 92.71 percent (June 30, 2022: 92.23 percent).

The decrease in the RWEAs compared with June 30, 2022 was €2,523 million. This was mainly due to the fall in the average daily stressed VaR and in the IRC on each of the preceding 60 business days. In both cases, the reduction was due to portfolio contraction.

FIG. 65 – EU MR2-A – MARKET RISK UNDER THE INTERNAL MODEL APPROACH (IMA)
(Article 455 sentence 1 letter e CRR)

		Dec. 31, 2022		Jun. 30, 2022	
		a	b	a	b
€ million		Risk-weighted exposure amounts (RWEAs)	Capital requirements	Risk-weighted exposure amounts (RWEAs)	Capital requirements
1	**VaR (higher of values a and b)**	**2,112**	**169**	1,880	150
a)	Previous day's VaR (VaRt-1)		30		50
b)	Multiplication factor (mc) x average of previous 60 working days (VaRavg)		169		150
2	**sVaR (higher of values a and b)**	**3,648**	**292**	5,986	479
a)	Latest available sVaR (SVaRt-1)		43		104
b)	Multiplication factor (ms) x average of previous 60 working days (sVaRavg)		292		479
3	**IRC (higher of values a and b)**	**1,072**	**86**	1,485	119
a)	Most recent IRC measure		79		119
b)	Average IRC measure for previous 12 weeks		86		107
4	**Comprehensive risk measurement (higher of values a, b, and c)**	-	-	-	-
a)	Most recent risk measure for comprehensive risk measurement		-		-
b)	Average measure for comprehensive risk measurement for previous 12 weeks		-		-
c)	Comprehensive risk measurement – floor		-		-
5	**Other**	-	-	5	-
6	**Total**	**6,832**	**547**	9,355	748

Fig. 66 is a flow statement designed to explain variations in the RWEAs for market risk, which are based on internal models (e.g. VaR, sVaR) and have to be determined in accordance with Part 3 Title IV Chapter 5 CRR (IMA).

The €2,872 million fall in the RWEAs compared with September 30, 2022 (column f, rows 1 and 8) was largely due to the regulatory adjustment (row 8b) of the sVaR (column b) during the period under review. There were two reasons for the decrease. Firstly, the months of August and September, when risk had been at an elevated level, were no longer included in the 60-day average. Secondly, the sVaR went down owing to exposure changes. The material factors were primarily new business and hedging business in the interest-rate structure portfolio and the reduction in the holdings of bank bonds in fixed-income trading. Furthermore, the quantitative addend for overshooting declined from 1.0 to 0.65 during the period under review.

In addition, the RWEA add-on for market risk not included in the market risk model fell out of the calculation as at December 31, 2022 (September 30, 2022: €7 million).

FIG. 66 – EU MR2-B – RWEA FLOW STATEMENTS OF MARKET RISK EXPOSURES UNDER THE INTERNAL MODEL APPROACH (IMA)
(Article 438 sentence 1 letter h CRR)

		a	b	c	d	e	f	g
€ million		**VaR**	**sVaR**	**IRC**	**Comprehensive risk measurement**	**Other**	**Total RWEAs**	**Total capital requirements**
1	**RWEAs at the end of the previous period**	**2,670**	**5,747**	**1,279**	**-**	**7**	**9,704**	**776**
1(a)	*Regulatory adjustment*	-2,069	-4,519	-18	-	-	-6,606	-529
1(b)	*RWEAs at the end of the previous quarter (end of the day)*	601	1,229	1,261	-	7	3,097	248
2	Movement in risk levels	-229	-672	-274	-	-	-1,175	-94
3	Model updates/ changes	0	-	-	-	-	0	0
4	Methodology and policy	-	-	-	-	-7	-7	-1
5	Acquisitions and disposals	-	-	-	-	-	-	-
6	Foreign exchange movements	7	-19	-	-	-	-13	-1
7	Other	-	-	-	-	-	-	-
8(a)	*RWEAs at the end of the disclosure period (end of the day)*	378	538	987	-	-	1,903	152
8(b)	*Regulatory adjustment*	1,734	3,110	84	-	-	4,929	394
8	**RWEAs at the end of the disclosure period**	**2,112**	**3,648**	**1,072**	**-**	**-**	**6,832**	**547**

Further quantitative disclosures

The value-at-risk for portfolios in the trading book, for which the capital requirement is determined using the internal model approach in accordance with article 363 et seq. CRR, and the potential stressed value-at-risk are disclosed in Fig. 67. It therefore shows the change in the market risk figures for the trading book portfolios.

This figure also shows the extent of the additional default and migration risk measured in relation to the total trading book and in relation to the relevant subportfolios as specified in articles 372 to 376 CRR.

FIG. 67 – EU MR3 – IMA VALUES FOR TRADING PORTFOLIOS
(Article 455 sentence 1 letter d CRR)

€ million		Dec. 31, 2022 a	Jun. 30, 2022 a
VaR (10 days, 99%)			
1	Maximum value	59	47
2	Average value	32	19
3	Minimum value	14	7
4	Period end	30	47
sVaR (10 days, 99%)			
5	Maximum value	135	129
6	Average value	84	85
7	Minimum value	43	60
8	Period end	43	96
IRC (99.9%)			
9	Maximum value	122	120
10	Average value	100	106
11	Minimum value	78	92
12	Period end	79	119
Comprehensive risk measurement (99.9%)			
13	Maximum value	-	-
14	Average value	-	-
15	Minimum value	-	-
16	Period end	-	-

The value-at-risk (10 days, 99 percent) decreased from €47 million to €30 million over the second half of 2022. This fall predominantly occurred in August, November, and December and was primarily attributable to portfolio changes. The reduction in the value-at-risk under stress conditions was also mainly due to portfolio changes.

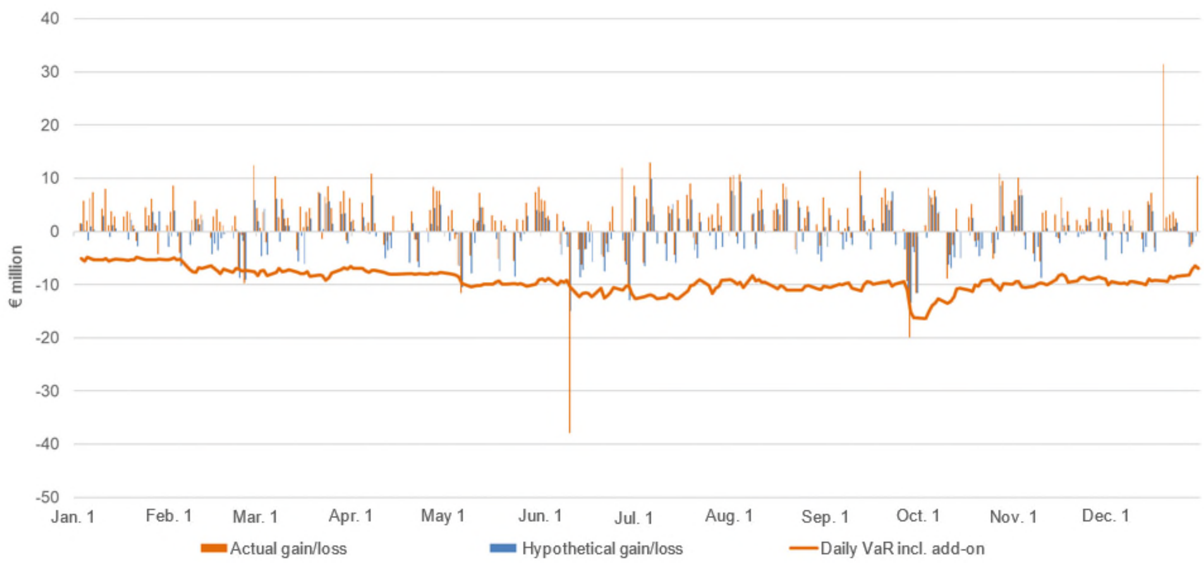
In accordance with article 455 (1) letter a CRR, the VaR and sVaR are allocated to interest-rate, currency, equity, commodity, and credit spread risk as shown below.

FIG. 68 – IMA VALUES FOR EACH SUBPORTFOLIO
(Article 455 sentence 1 letter a CRR)

€ million		Total VaR		Interest-rate VaR		Currency VaR		Equity VaR		Commodity VaR		Credit spread VaR	
		Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2022	Dec. 31, 2021
VaR (10 days, 99%)		25	14	9	10	6	3	4	5	4	3	22	11
1	Maximum value	51	90	28	11	20	11	23	26	6	11	44	137
2	Average value	27	21	13	9	7	5	5	5	4	4	31	28
3	Minimum value	7	6	7	5	2	2	1	1	3	2	10	2
4	Period end	25	14	9	10	6	3	4	5	4	3	22	11
sVaR (10 days, 99%)		39	71	14	11	7	8	4	8	9	10	86	117
5	Maximum value	129	159	26	31	23	20	23	75	14	14	159	147
6	Average value	79	70	11	13	12	11	6	10	11	11	133	116
7	Minimum value	39	31	5	6	2	4	2	1	6	6	86	66
8	Period end	39	71	14	11	7	8	4	8	9	10	86	117

The VaR, the stressed VaR (sVaR), and the incremental risk charge (IRC) are factored into the calculation of the regulatory capital requirement. The disclosures on backtesting pursuant to article 455 sentence 1 letter g CRR are shown in Fig. 69.

FIG. 69 – EU MR4 – COMPARISON OF VAR ESTIMATES WITH GAINS/LOSSES
(Article 455 sentence 1 letter g CRR)



The value-at-risk (1 day, 99 percent) increased from €5 million to €7 million in 2022.

The hypothetical changes in fair value and the actual changes in fair value, in which all reserves are also included, overshot the forecast risk value on four trading days. The forecast was overshot by just the hypothetical changes in fair value on a further three trading days. On another trading day, only the actual changes in fair value overshot the forecast. These incidences of overshooting were due to strong fluctuation in interest rates, interest-rate volatility, and credit spreads on the days in question that was attributable to expectations regarding the central banks' interest-rate decisions, uncertainty created by the war in Ukraine, uncertainty about the economic situation, and high inflation. The considerable overshooting of the forecast by the actual changes in fair value on June 10 and September 28, 2022 was also attributable to an increase in reserves.

The quantitative addend for overshooting pursuant to article 366 CRR stands at 0.65.

8.6 Interest-rate risk on exposures not included in the trading book

(Article 448 CRR)

The strategy for interest-rate risk in the banking book (IRRBB) is a substrategy of the DZ BANK banking group's market risk strategy. This means that IRRBB is covered by the group's overall strategy. All rules in the market risk strategy that relate to interest-rate risk apply analogously to the substrategy. All transactions in the banking book are relevant to IRRBB, i.e. all transactions and exposures that are not part of the trading book as defined for regulatory purposes. DZ BANK's trading book is defined in accordance with the generally applicable definition set out in the 'Definition of the trading book at DZ BANK AG' policy. All principles relating to interest-rate risk in the market risk strategy are generally applied. Notably, it is not permitted to enter into any exposures that are not in line with the business strategy or risk-bearing capacity.

Fundamentally, no unmatched material interest-rate risk is held in the banking book from a present value perspective. Interest-rate risk is mainly hedged using derivatives. No material maturity transformation is undertaken.

Present-value interest-rate risk (economic value of equity, EVE) is calculated daily and periodic interest-rate risk (net interest income, NII) is calculated monthly. They are taken into account in risk-bearing capacity and monitored.

Interest-rate risk from defined benefit obligations is consciously taken on within the specified limits.

At DZ BANK, interest-rate risk in the banking book mainly arises in the cover pool, from loans eligible as cover assets, from funding and money market business, from unsecured issuance activity, the unsecured funding business, and the lending business, in the liquidity pool, in the investment book, from the ABS exposures, and from the management of the Tier 1 and Tier 2 capital of DZ BANK and the banking group.

DZ BANK does not use any approaches for modeling customer behavior – particularly assumptions about early repayment of loans and behavior relating to open-ended deposits – with an impact on interest-rate risk.

DZ BANK consciously takes on these risks, calculates them daily, and takes them into account in its risk-bearing capacity.

When calculating interest-rate risk, the DZ BANK banking group examines the overall portfolio – comprising the trading and banking books – and the banking books in isolation. Interest-rate risk is measured as part of an integrated process. Specific information on the calculation of interest-rate risk in the trading book and banking book in conjunction with article 448 sentence 1 letter a CRR, including the type of interest-rate risk, key assumptions made, and frequency of risk measurement, is disclosed in section 8.2.2 of this report.

Article 448 sentence 1 letter b CRR requires disclosure of the interest-rate risk in the banking book. DZ BANK calculates this risk as a value-at-risk figure at banking group level as part of its internal management of market risk.

Responsibility for establishing the management of IRRBB and monitoring it lies with the Board of Managing Directors of DZ BANK. The task of monitoring and managing this risk has been delegated to the Risk Committee. To this end, regular reports on IRRBB are produced for this committee.

Responsibility for measuring EVE risk lies with the Group Risk Controlling division and is exercised centrally for the DZ BANK Group. NII risk is calculated on a decentralized basis, and the management units' calculations are aggregated centrally by Group Risk Controlling. This provides a consistent view of IRRBB across the group. It also ensures that IRRBB is measured independently of the risk owners, including at DZ BANK (primarily Group Treasury at DZ BANK).

In addition to the centralized management process, the management units are free to use their own methods for managing IRRBB themselves.

The following guidelines apply specifically to IRRBB:

- The focus is on setting limits for economic EVE risk. Accounting effects (NII risk and earnings risk) are of secondary importance.
- EVE risk shows the impact of interest-rate changes on discounted future cash flows (present values). In the DZ BANK Group, limits are set for EVE risk on the basis of a value-at-risk figure; EVE risk is a key factor in terms of management.
- NII risk shows the impact of interest-rate changes on the DZ BANK Group's net interest income. Limits are set for NII risk, which is a subordinate factor in terms of management.

- Earnings risk comprises the aforementioned NII risk plus the risk resulting from changes in fair value in respect of transactions recognized in the income statement or directly in equity (other comprehensive income). The effects of hedge accounting are also examined.
- Highly unlikely interest-rate scenarios are also examined in order to maintain risk-bearing capacity even in adverse scenarios.

In addition, inverse yield curves are examined in EVE. Spread risk is examined separately in the DZ BANK Group. Option risk is also examined separately in order to monitor and manage the impact of asymmetric risk profiles. Basic risk in the banking book is examined and monitored separately. Gap risk is monitored by analyzing and reporting on interest-rate sensitivities.

The reporting to the Risk Committee includes monthly reports on EVE risk and NII risk and on utilization of the related limits. A report on earnings risk is provided each quarter.

The models used to measure risk are validated at regular intervals to ensure that they are appropriate. An appropriateness test is conducted at least once per year.

A distinction is made between present-value interest-rate risk and periodic interest-rate risk for the purposes of the validation. As present-value risk is used for day-to-day management, a more thorough validation process based on daily and monthly validation is carried out along with an annual appropriateness test. Annual validation is carried out for periodic risk.

DZ BANK calculates the economic EVE risk in the banking book as a value-at-risk figure at banking group level as part of its internal management of market risk. Furthermore, interest-rate sensitivities provide an overview of changes in the EVE value in the event of a 1 basis point change in interest rates in a specific maturity band. The interest-rate sensitivities for IRRBB are determined by changing the yield curve.

Some of the entities in the DZ BANK banking group use behavior-based models to measure interest-rate risk. They help to accurately reflect the optionalities in traditional lending business and in building society operations. Examples of these include options for drawing down loans or credit lines, termination options, and special repayment options and other options.

Contractual and statutory termination rights are generally taken into account in the modeling of loans. BSH uses behavior-based modeling in the context of collective simulation for home savings deposits and home savings loans.

Calculating simulated NII involves a 1-year future projection of NII. This is based on assumptions regarding interest-rate changes (swap curves) and an assumption of a constant balance sheet with new business. The difference between the NII simulated in the baseline scenario (constant interest rates) and the NII simulated in an assumed interest-rate scenario is described as the NII risk for the particular interest-rate scenario.

The assumed interest-rate scenarios (NII and EVE) contain extreme changes to the current yield curve, including parallel shifts and rotations of the yield curve.

In EVE, in addition to calculating VaR, there is also a calculation of parallel shifts (-100, -50, -37, -25, -12, +12, +25, +50, +100bp), the BCBS interest-rate scenarios (parallel up, parallel down, flattener, steepener, short rate shock up, and short rate shock down; the down shift scenarios are calculated with a floor), and historical (with and without spreads) and hypothetical interest-rate scenarios (e.g. parallel shift of the yield curve +50bp, rotation at short end (0 years) +100bp without a floor, rotation of the yield curve from 50bp in the short rate to -100bp in the long rate).

NII risk is calculated for the interest-rate scenarios +200bp, -200bp, parallel up, parallel down, flattener, steepener, short rate shock up, and short rate shock down. The down shift scenarios are calculated with and without a floor. All currencies are included.

The DZ BANK Group does not use any approaches for modeling behavior relating to open-ended deposits with an impact on interest-rate risk. To measure interest-rate risk, a holding period of one day is assumed for open-ended deposits in DZ BANK's centralized market risk model and in the decentralized NII risk calculation.

FIG. 70 – EU IRRBB1 – INTEREST-RATE RISK IN THE BANKING BOOK
(Article 448 (1) letters a and b CRR)

Supervisory shock scenarios		a	b	c	d
		Changes in the economic value of equity		Changes in net interest income	
€ million		Dec. 31, 2022	Jun. 30, 2022	Dec. 31, 2022	Jun. 30, 2022
1	Parallel up	-672	-1,229	410	402
2	Parallel down	-144	-73	-508	-161
3	Steepener	-188	-284		
4	Flattener	209	64		
5	Short rates up	-623	-603		
6	Short rates down	362	339		

The data in Fig. 70 includes the DZ BANK banking group's exposures. At the end of 2022, a potential loss of €672 million was calculated for the parallel up scenario (June 30, 2022: potential loss of €1,229 million). As at December 31, 2022, utilization (3.2 percent for the early warning indicator and 2.7 percent for the standard indicator) was still well below the defined regulatory limits of 15 percent of Tier 1 capital and 20 percent of own funds.

The change in the NII risk in the parallel down scenario from minus €161 million to minus €508 million was largely due to ordinary business activities in connection with DZ BANK's management and optimization of the short-term liquidity position in the banking book.

EVE/NII: The floor pursuant to the Guidelines on the management of interest-rate risk arising from non-trading book activities (EBA/GL/2018/02) dated July 19, 2018 is applied. This involves setting a floor of minus 1 percent for the overnight interest rate in the down shift scenarios. The floor rises by 5 basis points per year for maturities of up to 20 years. For maturities of more than 20 years, a 0 percent floor applies. If the basic yield curve is already below the floor, the interest rate of the basic yield curve is used in the simulation (no shift).

EVE: Positive movements in the value of currencies are set at 50 percent. Only material currencies are taken into account. The changes in present value are determined on a risk-free yield curve without spreads.

9 Operational risk

(Article 446, article 454, and article 435 (1) CRR)

Table EU ORA – Qualitative information on operational risk
(Article 446 and article 454 in conjunction with article 435 (1) CRR)

9.1 Definition

(Article 446 and article 454 in conjunction with article 435 (1) CRR)

Operational risk refers to the risk of losses from human behavior, technological failure, weaknesses in process or project management, or external events.

In the reporting year, the following subtypes of operational risk were material for the Bank sector:

– Compliance risk including conduct risk
– Legal risk
– Information risk including ICT risk
– Security risk
– Outsourcing risk
– Project risk

Other subtypes of operational risk that are not material when viewed in isolation are brought together under 'Other operational risk'. This category is used to cover operational risks that cannot be allocated to the other subtypes of operational risk and – measured on the basis of risk profile – are of lesser importance.

9.2 Business background and risk strategy

(Article 446 and article 454 in conjunction with article 435 (1) letter a CRR)

Operational risk can arise in any division of the entities in the Bank sector. DZ BANK as well as DZ PRIVATBANK and UMH are particularly subject to operational risk.

The Bank sector entities aim to manage operational risk efficiently. They apply the following principles:

- Reinforce risk awareness
- Handle operational risk openly and largely without penalties
- Avoid, reduce, transfer, or accept risk as optional courses of action
- Manage operational risk on a decentralized basis but within the limits set out in the framework for operational risk
- Ensure that the impact of corporate policy decisions on operational risk is taken into account

9.3 Central risk management

(Article 446 and article 454 in conjunction with article 435 (1) letters b, c, and d CRR)

Identifying operational risk

The main tools used to manage and control operational risk in the DZ BANK Group's Bank sector are described below.

Loss database

The collation of loss data in a central database allows the Bank sector to identify, analyze, and evaluate loss events, highlighting patterns, trends, and concentrations of operational risk. In particular, data is recorded for operational risk that materializes and results in a gross loss of €1,000 or more.

Risk self-assessment

All management units assess operational risk using a scenario-supported risk self-assessment process in order to identify and evaluate all material operational risks and ensure maximum possible transparency regarding the risk position. The main potential risks for all first-level risk categories as defined by the CRR are calculated and described using risk scenarios. The scenarios also enable risk concentrations to be identified.

Risk indicators

In addition to the loss database and risk self-assessment, risk indicators help the Bank sector to identify risk trends and concentrations at an early stage and detect weaknesses in business processes. A system of warning lights is used to indicate risk situations based on specified threshold values. Risk indicators within the Bank sector are collected systematically and regularly on a wide scale.

Measurement of operational risk

An **economic portfolio model** that takes into account loss data and the results from the risk self-assessments is used to determine the risk capital requirement for operational risk in the Bank sector. The results from the model, combined with the tools used to identify risk, are used to manage operational risk centrally. Alongside the economic risk capital requirement, the model also calculates specific risk contributions for each management unit.

In addition, **risk concentrations** are identified by using separate model-based analyses, taking into account event categories and areas of business specified by regulatory requirements. These risk concentrations could occur in the different areas of business within the entities of the Bank sector.

In addition, a simplified procedure based on the allocation mechanism in the capital model is used to identify **risk drivers**. The risk driver analysis is carried out for all standard scenarios. The list of standard scenarios is maintained for use throughout the group and contains a list of general scenario descriptions that are relevant to operational risk in the Bank sector entities.

Limiting operational risk

The limits for operational risk are used as the basis for central monitoring of the risk capital requirement at the Bank sector level. The risk capital requirement for the Bank sector is broken down into risk contributions for each management unit using a risk-sensitive allocation procedure so that the management units in the Bank sector can be monitored centrally. These risk contributions are then monitored centrally using limits for each management unit.

Mitigating and avoiding operational risk

Continual improvement of business processes is one of the methods used with the aim of **mitigating** operational risk. The transfer of risk by means of insurance or outsourcing as permitted by liability regulations provides further protection.

Operational risk is **avoided**, for example, by rejecting products that can be identified during the new product process as entailing too much risk.

9.4 Organization, responsibility, and reporting

(Article 446 and article 454 in conjunction with article 435 (1) letters b and c CRR)

Each management unit is responsible for managing its operational risk. The principle of **decentralized** responsibility applies equally within the management units.

One of the purposes of the **framework for operational risk** is to harmonize risk management throughout the sector. The sector-wide coordinated approach to operational risk is also managed by a committee assigned to the Group Risk Management working group.

A **DZ BANK** organizational unit responsible for controlling operational risk located within the Group Risk Controlling division develops the management and control methods based on regulatory requirements and business needs applicable to the Bank sector. This organizational unit ensures that operational risk is monitored independently and is responsible for central reporting on operational risk in the Bank sector and at DZ BANK. Similar organizational units are also in place at the other main entities in the **Bank sector**.

Specialist divisions with central risk management functions are also assigned tasks relating to the management of operational risk. As part of their overarching responsibility, these specialist divisions also perform an advisory and guiding function for the matters within their remit in the relevant entities of the Bank sector.

Because operational risk can affect all divisions in the management units, **local operational risk coordinators** are located in each division and they liaise with central Risk Controlling.

Regular reports on loss data, risk self-assessments, risk indicators, and risk capital are submitted to the Board of Managing Directors, the Group Risk and Finance Committee, the Risk Committee, and operational management with the aim of facilitating effective management of operational risk on a timely basis.

9.5 Quantitative information on operational risk

(Article 446 CRR)

For the purposes of determining regulatory capital requirements, the potential loss arising from operational risk was primarily estimated in the DZ BANK banking group as at December 31, 2022 using the Standardized Approach in accordance with article 317 CRR. Due to its definition, the 'gross income' indicator used in this approach enables only very limited risk-sensitive management of operational risk. By contrast, the operational-risk instruments 'internal and external loss data' and 'scenario-based risk self-assessments' used in the economic capital model show historical and future components of operational risk and, in conjunction with a risk-sensitive capital allocation, enable the economic measurement and management of operational risk.

In respect of the economic capital requirements, a statistical model is used for the management units that satisfies the criteria for an Advanced Measurement Approach (AMA). The results from this portfolio model, combined with the materiality limits for collation of loss data, scenario-based risk self-assessments, and risk indicators, are used to manage operational risk.

FIG. 71 – EU OR1 – CAPITAL REQUIREMENTS FOR OPERATIONAL RISK AND RISK-WEIGHTED EXPOSURE AMOUNTS

		a	b	c	d	e	d	e
	Banking activities	Relevant indicator			Capital requirements	Exposure amount	Capital requirements	Exposure amount
€ mill		Dec. 31, 2019	Dec. 31, 2020	Dec. 31, 2021	Dec. 31, 2022		Dec. 31, 2021	
1	Banking activities subject to Basic Indicator Approach (BIA)	-	-	-	-	-	-	-
2	Banking activities subject to Standardized Approach (TSA)/Alternative Standardized Approach (ASA)	5,902	6,009	6,171	858	10,727	839	10,487
3	*Subject to TSA*	*5,902*	*6,009*	*6,171*				
4	*Subject to ASA*	-	-	-				
5	Banking activities subject to Advanced Measurement Approaches (AMA)	-	-	-	-	-	-	-

As at December 31, 2022, the DZ BANK banking group's capital requirements for operational risk amounted to €858 million, which was not materially different from the figure reported a year earlier (December 31, 2021: €839 million).

10 Business risk

(Article 435 (1) CRR)

10.1 Definition

(Article 435 (1) CRR)

Business risk refers to the risk that financial performance is not in line with expectations, and this is not covered by other types of risk. In particular, this comprises the risk that, as a result of changes in material circumstances (for example, economic conditions, product environment, customer behavior, market competitors) or inadequate strategic positioning, corrective action cannot be taken to prevent losses.

10.2 Risk strategy

(Article 435 (1) letter a CRR)

The objective of the business risk strategy is to specify how business risk is to be managed, taking into account the relevant **business drivers**, and thus contribute to achieving the targets set out in the business strategy. The focus is on preventing both an unplanned increase in risk and potential losses arising from a slump in income or from increases in staff expenses or operating costs.

The following **instruments** are used to support the attainment of targets:

- Forward-looking assessment of success factors and specification of targets as part of the strategic planning process
- Groupwide coordination of risk management, capital allocation, and corporate strategy, together with the leveraging of synergies
- Setting of limits and monitoring

10.3 Business risk management

(Article 435 (1) letter b CRR)

The management of business risk is closely linked with the tools used in the strategic planning process. It is based on setting targets for the subsidiaries involved in active management and for the divisions of DZ BANK.

To identify regulatory initiatives with a material impact on the DZ BANK Group and its entities, a **centralized regulation management office** has been set up at DZ BANK. This office establishes direct contact with the relevant units at DZ BANK and the other management units, and organizes regular bank-wide and groupwide dialogue on identified and new strategic regulatory initiatives. It also uses a ‘regulatory map’ to report to the relevant steering committees, the Board of Managing Directors, and the Supervisory Board of DZ BANK.

Business risk in the Bank sector is **quantified** using a risk model operated by DZ BANK and centralized data at the level of the DZ BANK Group. The risk model is based on an earnings-at-risk approach with due regard to the definition of economic available internal capital. A Monte Carlo simulation is used to model a probability distribution for the earnings relevant to business risk, which comprise selected income and expense items from the IFRS income statement, with an analysis period of one year. This distribution produces the risk capital requirement in the amount of the actual loss.

The broad diversification and sustainability of the business models used by the entities in the Bank sector are intended to prevent excessive **concentrations of income**. As part of a groupwide risk concentration analysis, which itself forms part of the risk inventory check, a review is carried out annually, and on an ad hoc basis as required, to identify concentrations of income and assess their materiality. This aims to ensure that income concentrations are appropriately taken into account in risk-bearing capacity.

10.4 Reporting

(Article 435 (1) letter c CRR)

Business risk is **reported** to the Board of Managing Directors quarterly as part of the overall risk report.

The Board of Managing Directors is also updated monthly about the income situation from an HGB perspective.

10.5 Reputational risk

(Article 435 (1) CRR)

10.5.1 Definition and business background

(Article 435 (1) CRR)

Reputational risk refers to the risk of losses from events that damage confidence, mainly among customers (including the cooperative banks), shareholders, employees, the labor market, the general public, and the supervisory authorities, in the entities in the DZ BANK Group or in the products and services that they offer. Reputational risk can arise either as an independent risk (primary reputational risk) or as an indirect or direct consequence of other types of risk (secondary reputational risk).

Reputational risk can arise in connection with any of the business activities in the entities within the Bank sector.

10.5.2 Risk strategy

(Article 435 (1) letter a CRR)

Reputational risk is incorporated into the risk strategy by pursuing the following **objectives**:

- Avoiding loss resulting from reputation-damaging incidents by taking preventive action
- Mitigating reputational risk by taking preventive and responsive action
- Raising awareness of (potential) reputational risk within the Bank sector, e.g. by defining the people responsible for risk and establishing a sector-wide reporting system and set of rules for reputational risk

These objectives are applicable both at the Bank sector level and in the management units. The management units are responsible for complying with the rules and for deciding what suitable preventive and responsive action to take.

The reputational risk strategy is based on the **business strategies** in each management unit and to this end is reviewed at least once a year and adjusted as necessary.

10.5.3 Responsibility and risk management

(Article 435 (1) letter b CRR)

Each management unit is responsible for managing its reputational risk and must comply with the requirements laid down in the set of rules for reputational risk. The principle of **decentralized** responsibility applies equally within the management units. Based on this approach, responsibility for managing reputational risk lies with each division with the involvement of other functions such as communications & marketing, corporate security, and compliance.

Reputational risk in the Bank sector is generally taken into account within **business risk** and is therefore implicitly included in the measurement of risk and assessment of capital adequacy.

At BSH, reputational risk is measured and the capital requirement determined mainly as part of the technical risk of a home savings and loan company.

In addition, the risk that obtaining funding may become more difficult as a consequence of reputational damage is specifically taken into account in liquidity risk management. The management units follow a stakeholder-based approach in which reputational risk is identified and evaluated from a qualitative perspective depending on the stakeholder concerned.

11 Liquidity requirements

(Article 451a CRR)

11.1 Definition

(Article 451a CRR)

Liquidity risk is the risk that cash and cash equivalents will not be available in sufficient amounts to ensure that payment obligations can be met. It is therefore defined as insolvency risk.

11.2 Management of liquidity adequacy

Table EU LIQA – Liquidity risk management
(Article 451a (4) in conjunction with article 435 (1) CRR)

11.2.1 Principles

(Article 451a (4) in conjunction with article 435 (1) CRR)

The management of liquidity adequacy is an integral component of business management in the DZ BANK Group and the management units. Liquidity adequacy is defined as the holding of sufficient liquidity reserves in relation to the risks arising from future payment obligations. It is considered from both an economic and a normative (regulatory) perspective. Whereas the economic perspective takes into account the requirements of MaRisk BA and the ECB Guide to the ILAAP, the normative perspective – while also taking account of the ECB Guide to the ILAAP – additionally applies the requirements from the CRR and the German national requirements for the implementation of the Capital Requirements Directive (CRD) in KWG.

Economic liquidity adequacy is managed on the basis of the internal liquidity risk model, which takes account of the impact on liquidity of other risks when measuring liquidity risk. Liquidity risk is significantly influenced by the risks that are backed by capital and those that are not backed by capital. In particular, reputational risk is relevant to liquidity risk. The DZ BANK Group fulfills the regulatory liquidity adequacy requirements by managing economic liquidity adequacy.

11.2.2 Business background and risk strategy

(Article 451a (4) in conjunction with article 435 (1) letter a CRR)

The activities of DZ BANK and the management units BSH, DZ HYP, DZ PRIVATBANK, TeamBank, and VR Smart Finanz are relevant to the level of liquidity risk in the DZ BANK Group.

A key component of the liquidity risk strategy is the process of specifying and monitoring the risk appetite for liquidity risk. The liquidity risk strategy aims to establish a binding basis for implementing these requirements at operational level.

The operations of the entities in the DZ BANK Group are governed by the principle that liquidity risk must only be assumed if it is in compliance with the **risk appetite** specified by the Board of Managing Directors. Solvency must be ensured, even in times of serious crisis. Risk appetite is expressed in the form of crisis scenarios, and stress tests must demonstrate that there is adequate cover for these scenarios. The crisis scenarios also take into account the specific MaRisk BA requirements for the structure of stress scenarios at capital-market-oriented banks.

However, further **extreme scenarios** are not covered by the risk appetite. The risks arising in this regard are accepted and therefore not taken into account in the management of risk. Examples of such scenarios are a run on the bank, i.e. an extensive withdrawal of customer deposits as a result of damage to the reputation of the banking system, or a situation in which all non-collateralized funding sources on money markets completely dry up over the long term, also encompassing transactions with those corporate customers, institutional customers, and customer banks that have close ties to the entities in the DZ BANK Group. On the other hand, the risk of a short-term and complete loss, or the risk of a medium-term and substantial loss, of unsecured funding from institutional investors is not accepted and this risk is the subject of relevant stress scenarios.

Liquidity reserves in the form of liquid securities are held by the entities so that they can remain solvent, even in the event of a crisis. Potential sources of funding in the secured and unsecured money markets are safeguarded by maintaining a broadly diversified national and international customer base. The local cooperative banks also provide a significant source of funding.

DZ BANK aims to ensure that the liquidity risk strategy is consistent with the **business strategies**. To this end, the liquidity risk strategy is reviewed at least once a year with due regard to the business strategies and adjusted as necessary.

11.2.3 Liquidity risk management

(Article 451a (4) in conjunction with article 435 (1) letters b and d CRR)

Measurement of liquidity risk

DZ BANK uses an **internal risk model** to determine liquidity risk for the DZ BANK Group and DZ BANK over a time horizon of one year. Using this model, four stress scenarios and one risk scenario are simulated on a daily basis. In addition to DZ BANK, all other entities in the DZ BANK Group relevant to liquidity risk are integrated into the groupwide measurement of this risk.

A **minimum liquidity surplus** figure is calculated for each scenario. This figure quantifies the minimum surplus cash that would be available if the scenario were to materialize suddenly within the next 12 months. To carry out this calculation, cumulative cash flow (forward cash exposure) is compared against available liquidity reserves (counterbalancing capacity) on a day-by-day basis. The minimum liquidity surplus expresses economic liquidity adequacy. **Forward cash exposure** includes both expected and unexpected payments.

The **counterbalancing capacity** includes balances on nostro accounts, liquid securities, and unsecured funding capacity with customers, banks, and institutional investors. By including the counterbalancing capacity, the calculation of the minimum liquidity surplus already takes into account the effect on liquidity of the measures that could be implemented to generate liquidity in each scenario. These measures include collateralized funding of securities in the repo market.

The internal liquidity risk model is constantly revised using an **appropriateness test** and adjusted in line with changes in the market, products, and processes. The appropriateness test is conducted for each entity in the DZ BANK Group and aggregated at group level.

Liquidity risk stress tests

Stress tests are conducted for the forward cash exposure and for the counterbalancing capacity using the following four scenarios with defined limits: downgrading, corporate crisis, market crisis, and combination crisis. The stress scenarios are defined as follows:

– **Downgrading**: Long-term ratings awarded by Standard & Poor's, Moody's, and Fitch Ratings to one or more entities in the DZ BANK Group downgraded by one notch. The downgrade is triggered by a deterioration in profitability or in the earnings forecast or by a preceding loss of confidence among customers and banks.

– **Corporate crisis**: Serious entity-specific crisis, for example caused by reputational damage. The main consequences of this scenario could be a considerable negative impact on customer behavior and the downgrading by three notches of the long-term ratings awarded by all of the aforementioned rating agencies.

- **Market crisis**: Turmoil in global money and capital markets. The primary feature of this scenario is a sudden, sharp fall in the value of assets traded in these markets. The scenario assumes, for example, a loss of confidence among money market players, which could lead to a liquidity squeeze.
- **Combination crisis**: Analysis of a combination of bank-specific and market-related factors. However, it does not constitute a mere aggregation of the two stress scenarios arising from a market crisis and a corporate crisis. Instead, the interaction between the two scenarios is taken into account. The combination crisis assumes that the financial sector would be particularly badly affected. The underlying scenario is also based on a deterioration in the reputation of the entities in the DZ BANK Group. It assumes there would only be very limited access to unsecured funding from customers, banks, and institutional investors over the forecast period of one year.

The stress scenario with the lowest minimum liquidity surplus is deemed to be the **squeeze scenario**. Economic liquidity adequacy is determined as the amount of the minimum liquidity surplus in the squeeze scenario.

Further stress scenarios in addition to the scenarios with defined limits are analyzed, and a **reverse stress test** is carried out and reported on a monthly basis. The reverse stress test shows which stress events (changes in risk factors) could still occur without liquidity falling below the limit in a subsequent liquidity risk measurement and triggering the need for a business model adjustment. In addition, **adverse stress tests** are carried out to provide a forward-looking assessment of liquidity risk. They involve analyzing whether the DZ BANK Group would be able to ensure an adequate level of liquidity even in the event of exceptional, but plausible, developments over a medium-term horizon. The adverse stress test scenarios underlying this forecast are also used in ICAAP stress testing.

Management of limits for liquidity risk

Liquidity risk is monitored and managed with the aim of ensuring economic liquidity adequacy at every measurement date. This is based on the minimum liquidity surplus calculated for the four stress scenarios with defined limits. The Board of Managing Directors of DZ BANK has set, at the level of the **DZ BANK Group**, a **limit** (€1.0 billion) for liquidity risk and an **observation threshold** (€4.0 billion) that is higher than the limit. The observation threshold equates to the threshold value for economic liquidity adequacy specified in the risk appetite statement. The observation threshold and limit as at December 31, 2022 were unchanged compared with the end of 2021. The Board of Managing Directors of DZ BANK has also specified a limit for **each management unit**. The observation threshold and the limits are monitored by the liquidity risk control function at DZ BANK both at group level and also for the management units.

The limit system aims to ensure that the DZ BANK Group remains solvent even in serious stress scenarios. **Emergency liquidity plans** are in place so that the group is able to respond to crisis events rapidly and in a coordinated manner. The emergency plans are revised annually.

Liquidity risk mitigation

Within liquidity management activities, measures to reduce liquidity risk are initiated by the treasury units of the management units. Active liquidity risk management is made possible by holding instruments in the form of cash and liquid securities, and by managing the maturity profile of money market and capital market transactions.

Liquidity transfer pricing system

The DZ BANK Group aims to use liquidity – which is both a resource and a success factor – in line with risks. Liquidity costs, benefits, and risks are allocated among the entities in the DZ BANK Group based on the liquidity transfer pricing system using internal prices charged by the units generating liquidity and paid by those consuming liquidity. Care is taken to ensure that the transfer prices are consistent with risk measurement and risk management.

Transfer prices are set for all significant products. The transfer pricing system takes into account the holding period and market liquidity of the products and has an impact on risk/return management.

11.2.4 Organization and responsibility

(Article 451a (4) in conjunction with article 435 (1) letter b CRR)

The strategic guidelines for the management of liquidity risk by the entities in the DZ BANK Group are established by the Group Risk and Finance Committee. At the level of DZ BANK, this is the responsibility of the **Asset/Liability Committee**.

Liquidity risk control in the DZ BANK Group is coordinated by the Group Risk Management working group and carried out in Risk Controlling at DZ BANK independently of the units that are responsible for liquidity risk management. The risk data calculated by the subsidiaries on the basis of intragroup guidelines is aggregated to provide a group perspective.

The **Group Financial Services** division calculates the liquidity ratios reported for supervisory purposes resulting from the CRR and Commission Delegated Regulation (EU) 2015/61 for the liquidity subgroup and, using the corresponding values for the management units, for the DZ BANK banking group.

11.2.5 Reporting

(Article 451a (4) in conjunction with article 435 (1) letter c CRR)

Liquidity up to one year and structural liquidity of one year or more are reported by liquidity risk control at DZ BANK on a daily basis to the **members of the Board of Managing Directors** of DZ BANK responsible for the Group Treasury and Group Risk Controlling divisions. The **Board of Managing Directors** receives a monthly report on liquidity risk. The DZ BANK Group Treasury division and the units in the subsidiaries responsible for the management of liquidity risk also receive detailed daily information showing the contribution from each individual position to the aggregate position.

The **Group Risk and Finance Committee** receives a quarterly report on the liquidity risk of the DZ BANK Group and the individual management units. The entities in the DZ BANK Group have their own corresponding reporting procedures that help to manage and monitor liquidity risk at individual entity level.

Group Treasury is informed on a daily basis of the largest providers of liquidity in the unsecured money markets. This is reported to the **Asset/Liability Committee (ALCo)** and the **Board of Managing Directors** on a monthly basis. These reports make a distinction between customers and banks, ensuring that any possible concentration risk as regards sources of liquidity can be clearly identified at an early stage.

Both the Asset/Liability Committee (ALCo) and the Board of Managing Directors are notified of the LCR and the NSFR each month.

11.3 Adequacy of the level of liquidity

(Article 451a (4) in conjunction with article 435 (1) letter e CRR)

A declaration approved by the Board of Managing Directors on the adequacy of the level of liquidity (liquidity adequacy statement, LAS) is drawn up annually. The LAS contains the liquidity risk statement, which describes the institution's entire liquidity risk profile relating to the business strategy.

The LAS also includes disclosures on the minimum liquidity surplus, which means that it does not just contain the key figures stipulated in template EU LIQ1 (see Fig. 73).

Economic liquidity adequacy is assured if none of the four stress scenarios with defined limits (downgrading, corporate crisis, market crisis, and combination crisis) exhibit a negative value for the key risk indicator 'minimum liquidity surplus'. Fig. 72 shows the results of measuring liquidity risk. The results are based on a daily calculation and comparison of forward cash exposure and counterbalancing capacity. The values reported are the values that occur on the day on which the liquidity surplus calculated over the forecast period of one year is at its lowest point.

FIG. 72 – LIQUIDITY UP TO 1 YEAR IN THE STRESS SCENARIOS WITH DEFINED LIMITS: MINIMUM LIQUIDITY SURPLUSES FOR THE DZ BANK GROUP

	Forward cash exposure		Counterbalancing capacity		Minimum liquidity surplus	
€ billion	**Dec. 31, 2022**	**Dec. 31, 2021**	**Dec. 31, 2022**	**Dec. 31, 2021**	**Dec. 31, 2022**	**Dec. 31, 2021**
Downgrading	-39.1	-22.5	67.8	51.7	28.7	29.2
Corporate crisis	-30.2	-11.0	44.5	32.9	14.3	21.9
Market crisis	-32.9	-13.2	57.6	42.2	24.7	29.0
Combination crisis	-31.8	0.5	51.4	18.9	19.6	19.4

The liquidity risk value measured for the **DZ BANK Group** as at December 31, 2022 for the stress scenario with defined limits with the lowest minimum liquidity surplus (squeeze scenario) was €14.3 billion (December 31, 2021: €19.4 billion). The liquidity risk value attributable to **DZ BANK** as at December 31, 2022 was €4.2 billion (December 31, 2021: €4.5 billion). The decrease in the minimum liquidity surplus for the DZ BANK Group was largely due to a rise in lending business and in purchases of own issues of the local cooperative banks. New issues did not fully cover the funding requirements.

The risk values as at December 31, 2022 for the **DZ BANK Group** were above the internal threshold value (€4.0 billion) and above the limit (€1.0 billion). They were also above the external minimum target (€0 billion). The observation threshold, limit, and external minimum target remained unchanged compared with 2021. Furthermore, **DZ BANK** did not exceed the limit of €700 million (December 31, 2021: €325 million).

The minimum liquidity surplus as at December 31, 2022 for both the DZ BANK Group and DZ BANK was positive in the stress scenarios with defined limits that were determined on the basis of risk appetite. This is due to the fact that the counterbalancing capacity was above the cumulative cash outflows on each day of the defined forecast period in every scenario, which indicates that the cash outflows assumed to take place in a crisis could be comfortably covered.

11.4 Quantitative LCR disclosures

(Article 451a (2) CRR)

The LCR measures the availability of an adequate buffer in the form of liquid assets that enables an institution to independently compensate for a possible imbalance between inflows and outflows of cash in a 30-day stress scenario. The LCR is the ratio of liquid assets held ('liquidity buffer') to net cash outflows.

Since January 1, 2018, a minimum LCR of 100 percent has had to be maintained. DZ BANK reports the LCR of the banking group, calculated in accordance with the CRR in conjunction with Delegated Regulation (EU) 2015/61 dated July 29, 2015 as amended by Regulation (EU) 2018/1620 dated July 13, 2018, to the supervisory authority on a monthly basis.

The presentation of the liquidity coverage ratio for the DZ BANK banking group in Fig. 73 is based on Implementing Regulation (EU) 2021/637 dated March 15, 2021, which requires the liquidity coverage ratio to be disclosed quarterly at consolidated level. The disclosed line items are each calculated as the average of the month-end values for the previous 12 months.

FIG. 73 – EU LIQ1 – QUANTITATIVE INFORMATION ON THE LIQUIDITY COVERAGE RATIO (LCR)
(Article 451a (2) CRR)

		a	b	c	d	e	f	g	h
€ million		Total unweighted value (average)				Total weighted value (average)			
EU 1a	Quarter ending on	Dec. 31, 2022	Sep. 30, 2022	Jun. 30, 2022	Mar. 31, 2022	Dec. 31, 2022	Sep. 30, 2022	Jun. 30, 2022	Mar. 31, 2022
EU 1b	Number of data points used in the calculation of the averages	12	12	12	12	12	12	12	12
High-quality liquid assets									
1	Total high-quality liquid assets (HQLAs)					124,173	120,706	117,389	114,854
Cash outflows									
2	Retail deposits and deposits from small business customers, of which:	68,477	68,378	68,218	67,942	932	900	850	799
3	Stable deposits	610	596	575	559	30	30	29	28
4	Less stable deposits	1,410	1,420	1,399	1,369	206	207	205	201
5	Unsecured wholesale funding	125,080	124,971	122,519	120,530	84,858	82,855	78,294	74,448
6	Operational deposits (all counterparties) and deposits in networks of cooperative banks	40,704	43,984	47,303	50,292	10,176	10,996	11,826	12,573
7	Non-operational deposits (all counterparties)	73,807	69,783	65,261	61,895	64,113	60,655	56,513	53,532
8	Unsecured debt	10,570	11,204	9,955	8,343	10,570	11,204	9,955	8,343
9	Secured wholesale funding					146	109	119	108
10	Additional requirements	46,611	45,140	44,042	43,365	16,977	16,118	15,381	15,020
11	Outflows related to derivative exposures and other collateral requirements	8,632	8,115	7,856	8,004	8,074	7,649	7,316	7,295
12	Outflows related to loss of funding on debt products	158	127	126	104	158	127	126	104
13	Credit and liquidity facilities	37,821	36,899	36,059	35,256	8,746	8,343	7,939	7,621
14	Other contractual funding obligations	2,437	2,693	2,440	2,225	1,991	2,241	1,994	1,801
15	Other contingent funding obligations	33,556	33,075	32,783	32,638	804	806	800	766
16	**TOTAL CASH OUTFLOWS**					**105,709**	**103,030**	**97,437**	**92,942**
Cash inflows									
17	Secured lending (e.g. reverse repos)	13,891	12,629	11,359	9,443	927	841	593	320
18	Inflows from fully performing exposures	20,252	20,381	19,275	17,731	15,475	15,873	15,054	13,871
19	Other cash inflows	4,742	4,612	4,393	4,463	3,694	3,590	3,403	3,494
EU-19a	(Difference between total weighted inflows and total weighted outflows arising from transactions in third countries where there are transfer restrictions or which are denominated in non-convertible currencies)					-	-	-	-

		a	b	c	d	e	f	g	h
€ million		Total unweighted value (average)				Total weighted value (average)			
EU 1a	Quarter ending on	Dec. 31, 2022	Sep. 30, 2022	Jun. 30, 2022	Mar. 31, 2022	Dec. 31, 2022	Sep. 30, 2022	Jun. 30, 2022	Mar. 31, 2022
EU-19b	(Excess inflows from a related specialized credit institution)					-	-	-	-
20	TOTAL CASH INFLOWS	38,885	37,622	35,026	31,637	20,095	20,304	19,050	17,685
EU-20a	Fully exempt inflows	-	-	-	-	-	-	-	-
EU-20b	Inflows subject to 90% cap	245	241	238	235	157	154	151	149
EU-20c	Inflows subject to 75% cap	38,619	37,354	34,757	31,369	19,938	20,150	18,899	17,536
Total adjusted value									
EU-21	LIQUIDITY BUFFER					124,173	120,706	117,389	114,854
22	TOTAL NET CASH OUTFLOWS					85,613	82,726	78,387	75,256
23	LIQUIDITY COVERAGE RATIO					145.25	146.14	150.24	153.08

The average LCR for the DZ BANK banking group as at December 31, 2022 calculated in accordance with this method was 145.25 percent (September 30, 2022: 146.14 percent), based on average liquid assets of €124,173 million (September 30, 2022: €120,706 million) and net liquidity outflows of €85,613 million (September 30, 2022: €82,726 million).

The LCR did not fall below the minimum ratio at any time and, at present, significantly exceeds it.

11.5 Qualitative LCR disclosures

EU LIQB – Qualitative information on the LCR (supplementing template EU LIQ1)
(Article 451a (2) CRR)

The fall in the DZ BANK banking group's LCR over the past 12 months was largely attributable to lower excess cover (calculated by deducting total net cash outflows from the liquidity buffer), which was the result of a greater increase in average net cash outflows relative to the liquidity buffer.

The growth of the liquidity buffer in 2022 was mainly due to higher balances with central banks on the back of an increased volume of unsecured funding from deposits and an increased volume of commercial paper issued.

Operational deposits from the cooperative financial network continued to decline over time and were replaced by non-operational deposits, largely from financial customers. Whereas deposits from financial customers have to be included in cash outflows with a weighting factor of 100 percent, operational deposits from the cooperative financial network are taken into account with a weighting factor of only 25 percent. That is why the replacement of the latter with deposits from financial customers led to an increase in the weighted net cash outflows and thus to a negative contribution to excess cover.

The DZ BANK banking group's main short-term and medium-term funding sources on the unsecured money markets essentially comprise deposits from local cooperative banks, deposits from corporate customers and institutional customers, and commercial paper held by institutional investors.

The DZ BANK banking group also obtains long-term funding through structured and non-structured capital market products that are mainly marketed to local cooperative banks and other institutional customers.

A large proportion of the long-term funding results from the issuance of covered bonds such as Pfandbriefe or DZ BANK BRIEFE, which were issued on a decentralized basis, in other words based on the different cover assets at DZ BANK, DZ HYP, and Bausparkasse Schwäbisch Hall. Another major source of funding is Bausparkasse Schwäbisch Hall's home savings deposits.

Within the LCR, deposits from corporate customers, deposits from local cooperative banks, and deposits from financial customers with a term to maturity of under 30 days have the biggest impact on the liquidity outflows of the DZ BANK banking group.

The liquidity sources included in the liquidity buffer for the LCR at the level of the DZ BANK banking group predominantly consist of balances with central banks and liquid securities. The dominant liquid securities under assets at level 1 (assets that are of extremely high liquidity and credit quality) are government and regional government bonds, bonds of public-sector entities and multilateral development banks, and extremely high-quality covered bonds. The assets at level 2 (assets that are of high liquidity and credit quality) largely comprise high-quality covered bonds and liquid corporate bonds.

Line item 11 in Fig. 73 – outflows related to derivative exposures and other collateral requirements – consists of potential outflows as a result of

- fluctuations in the fair value of derivatives and the related volatility of the collateral;
- subsequent collateral requirements caused by an assumed worsening of an entity's own credit rating by three notches;
- other potential collateral calls.

The biggest contribution to this line item is the simulation – using the historical look-back approach (HLBA) – of the effects of fluctuations in the fair value of derivatives on the collateral. This involves simulating a stress scenario specified by the supervisory authority.

The effects of subsequent collateral requirements owing to a simulated worsening of the credit rating of the entities in the DZ BANK banking group by three notches also have a significant influence on the aforementioned line item. This is because some OTC collateral agreements that entities in the DZ BANK banking group have entered into contain rating-based triggers. A downgrade in an entity's own credit rating would trigger additional collateral calls by counterparties.

At the level of the DZ BANK banking group, the US dollar was the only significant foreign currency in 2022 as the liabilities in this currency exceeded 5 percent of the total liabilities of the DZ BANK banking group. This gives rise to a requirement to disclose the LCR in US dollars on a monthly basis. However, there is no minimum LCR requirement for US dollars.

The currency mismatch in the liquidity coverage ratio for the US dollar, pound sterling, the Swiss franc, the Hong Kong dollar, and the Singapore dollar, which are the most significant currencies for the DZ BANK banking group besides the euro, is calculated and monitored monthly.

Short-term deposits from major corporate customers and financial customers have a big impact on the level of liquidity outflows under the LCR of the DZ BANK banking group. The corresponding line items (Fig. 73, rows 5 and 6) are dominated by deposits from the local cooperative banks. DZ BANK performs the central cash-pooling function for these institutions. Local cooperative banks with available liquidity can invest it with DZ BANK, while those requiring liquidity can obtain it from DZ BANK.

The DZ BANK banking group also has inflows that, contrary to the fundamental eligibility cap of 75 percent pursuant to article 33 (4) of Delegated Regulation (EU) 2015/61, are subject to a cap of 90 percent (Fig. 73, row EU-20b). These are attributable to TeamBank AG, which has been granted approval by the ECB to apply the aforementioned article in conjunction with article 33 (5) of Delegated Regulation (EU) 2015/61. This entity's liquidity inflows are therefore not subject to the usual cap on eligibility for the LCR.

Since December 31, 2021, the DZ BANK banking group has been permitted by the ECB to apply a liquidity waiver pursuant to article 8 CRR. This waiver exempts DZ BANK and DZ HYP from fulfilling the requirements for the LCR at individual institution level. Instead, the requirements for the LCR are to be applied at the level of a single liquidity subgroup consisting of these two institutions.

11.6 Net stable funding ratio (NSFR)

(Article 451a (3) CRR)

The net stable funding ratio (NSFR) is a structural liquidity ratio that is used to measure the degree to which an institution matches the maturities of its funding over a 1-year horizon. It is the ratio of available stable funding (ASF) to required stable funding (RSF). Required stable funding is based on the receivables recognized on the assets side of the balance sheet, whereas available stable funding is derived from the equity and liabilities side of the balance sheet. In the calculation of the NSFR, the individual RSF and ASF items are weighted with the factors specified in the CRR.

The NSFR supplements the regulatory requirements in Pillar 1 for measuring liquidity risk, and its final definition was set out when CRR II was published on May 20, 2019. According to the requirements in CRR II, a minimum NSFR of 100 percent has had to be maintained at all times since June 28, 2021.

The presentation of the net stable funding ratio for the DZ BANK banking group in Fig. 74 is based on Implementing Regulation (EU) 2021/637 dated March 15, 2021, which requires the net stable funding ratio to be disclosed on a half-yearly basis at consolidated level. The disclosed line items are each calculated as unweighted and weighted values.

FIG. 74 – EU LIQ2 – NET STABLE FUNDING RATIO
(Article 451a (3) CRR)

		a	b	c	d	e	e
		Unweighted value by residual maturity				**Weighted amount as at Dec. 31, 2022**	**Weighted amount as at Jun. 30, 2022**
€ million		**No residual maturity**	**< 6 months**	**6 months to < 1 year**	**≥ 1 year**		
Available stable funding (ASF) items							
1	Capital items and instruments	21,079	7	3	4,288	25,367	25,084
2	Own funds	21,079	7	3	3,848	24,927	24,635
3	Other capital instruments		-	-	441	441	449
4	Retail deposits		28,295	32,913	7,501	65,435	65,180
5	Stable deposits		24,798	32,132	7,348	61,432	61,279
6	Less stable deposits		3,498	781	153	4,004	3,901
7	Wholesale funding:		161,043	17,193	125,884	177,471	189,674
8	Operational deposits		3,315	-	-	1,657	1,635
9	Other wholesale funding		157,728	17,193	125,884	175,814	188,040
10	Interdependent liabilities		815	353	76,612	-	-
11	Other liabilities:	3,567	6,798	150	1,132	1,207	1,148
12	NSFR for derivative liabilities	3,567					
13	All other liabilities and capital instruments not included in the above categories		6,798	150	1,132	1,207	1,148
14	**Total available stable funding (ASF)**					**269,480**	**281,086**

		a	b	c	d	e	e
		Unweighted value by residual maturity				Weighted amount as at Dec. 31, 2022	Weighted amount as at Jun. 30, 2022
€ million		No residual maturity	< 6 months	6 months to < 1 year	≥ 1 year		
Required stable funding (RSF) items							
15	Total high-quality liquid assets (HQLAs)					7,797	11,068
EU-15a	Assets encumbered for a residual maturity of one year or more in a cover pool		691	858	45,316	39,835	39,715
16	Deposits held at other financial institutions for operational purposes		277	-	-	138	138
17	Performing loans and securities:		52,658	16,106	164,782	159,020	166,229
18	Performing securities financing transactions with financial customers collateralized by Level 1 HQLAs subject to 0% haircut		12,282	182	79	2,921	9,540
19	Performing securities financing transactions with financial customers collateralized by other assets and loans and advances to financial institutions		17,235	4,752	32,560	36,747	35,196
20	Performing loans to non-financial corporate clients, loans to retail and small business customers, and loans to sovereigns and PSEs, of which:		15,885	8,172	62,474	94,941	95,591
21	With a risk weight of less than or equal to 35% under the Basel II Standardized Approach to credit risk		1,630	1,131	10,916	39,238	39,374
22	Performing residential mortgages, of which:		909	1,016	45,568	-	-
23	With a risk weight of less than or equal to 35% under the Basel II Standardized Approach to credit risk		909	1,016	45,568	-	-
24	Other loans and securities that are not in default and do not qualify as HQLAs, including exchange-traded equities and on-balance-sheet trade finance products		6,347	1,985	24,101	24,411	25,902
25	Interdependent assets		490	351	76,014	-	-
26	Other assets	-	33,769	134	8,865	11,040	11,798
27	Physically traded commodities				0	0	0
28	Assets posted as initial margin for derivative contracts and contributions to default funds of CCPs			4,043		3,437	2,573
29	NSFR for derivative assets			-		-	-
30	NSFR for derivative liabilities before deduction of variation margin posted			22,910		1,145	875
31	All other assets not included in the above categories		10,420	128	5,268	6,457	8,349
32	Off-balance-sheet items		33,855	3,825	29,946	2,661	2,743
33	**Total RSF**					**220,257**	**231,692**
34	**Net stable funding ratio (%)**					**122.35**	**121.32**

The increase in the NSFR from 121.32 percent as at June 30, 2022 to 122.35 percent as at December 31, 2022 was attributable to the NSFR's greater sensitivity in relation to the decrease in funding requirements, which made up for the fall in excess cover.

The small reduction in excess cover was due to a more pronounced fall – relative to the decrease in the funding requirements – in the amount of available stable funding following the partial TLTRO repayment and a reduced volume of own issues. The decrease in the funding requirements from encumbered securities that was due to the partial TLTRO cancellation was partly offset by an increase in loans and therefore led to a negative contribution to excess cover.

Excess cover in relation to the NSFR is the difference between the available stable funding and the required stable funding.

In the DZ BANK Group, development loans are categorized as interdependent assets and liabilities pursuant to article 428f (2) letter b CRR. The development loans at DZ BANK and DZ HYP fall into this category. This product type is highly relevant, particularly for DZ BANK, because of its participation in various development programs and because of its pass-through role for the primary banks. The volume as at December 31, 2022 came to €74,426 million for DZ BANK and €1,878 million for DZ HYP.

In addition, derivative clearing activities for customers are categorized as interdependent assets and liabilities pursuant to article 428f (2) letter d CRR in the DZ BANK Group. This affects DZ BANK and DZ PRIVATBANK, which, in the role of the central institution, perform derivative clearing activities for the primary banks in the Volksbanken Raiffeisenbanken cooperative financial network that do not have direct access to central counterparties (CCPs). This relates to both exchange-traded and OTC derivatives.

Since December 31, 2021, the DZ BANK banking group has been permitted by the ECB to apply a liquidity waiver pursuant to article 8 CRR. As with the LCR, this waiver exempts DZ BANK and DZ HYP from fulfilling the requirements for the NSFR at individual institution level. Instead, the requirements for the NSFR are to be applied at the level of a single liquidity subgroup consisting of these two institutions.

As at the reporting date, both the internal threshold for the DZ BANK banking group's NSFR and the regulatory minimum requirement were exceeded at the level of the DZ BANK banking group and the liquidity subgroup.

12 Leverage ratio

(Article 451 CRR)

12.1 Leverage pursuant to the CRR framework

(Article 451 (1) letters d and e CRR)
(Table EU LRA – Disclosure of LR qualitative information)

The **leverage ratio (LR)** is the ratio of the banking group's Tier 1 capital to its total exposure – comprising on-balance-sheet asset items and off-balance-sheet items (including derivatives). In contrast to risk-based capital requirements, the individual exposures are not given a credit-rating-related risk weight but are generally included in the total exposure without being weighted. Fundamentally, the leverage ratio thus represents a risk-neutral capital ratio. A low ratio therefore indicates a high level of debt in relation to Tier 1 capital. The purpose of the leverage ratio is to prevent the build-up of unsustainable leverage in the banking industry.

In accordance with article 429 (3) CRR, the capital measure is based on Tier 1 capital. The total exposure measure is calculated in accordance with article 429 et seq. CRR.

Pursuant to article 92 (1) letter d CRR, a binding minimum ratio of 3.0 percent applies. Decision (EU) 2021/1074 of the ECB extended the temporary option to exclude certain exposures to central banks (exposures to central banks in the Eurosystem, deposits held in the deposit facility, and balances held in reserve accounts in the Eurosystem, including the funds held to satisfy minimum reserve requirements) from the total exposure measure until March 31, 2022 in view of the ongoing COVID-19 pandemic; the exclusion had originally been due to end on June 27, 2021. This option expired on March 31, 2022, which means that exposures to central banks have had to be included in the total exposure measure in full again since April 1, 2022.

The DZ BANK banking group's leverage ratio pursuant to the CRR transitional guidance was 4.74 percent as at December 31, 2022 (June 30, 2022: 4.48 percent). The updated IFRS 9 transitional provisions were applied pursuant to article 473a CRR. The quantitative effect of these transitional provisions on the leverage ratio is shown in section 5.3.1 (see Fig. 12).

Fig. 75 shows the reconciliation of the total assets of the DZ BANK Group to the leverage ratio total exposure measure of the DZ BANK banking group, applying the CRR transitional guidance.

Fig. 75 – EU LR1 – LRSum – Summary reconciliation of assets on the balance sheet and leverage ratio exposures
(Article 451 (1) letter b CRR)

€ million		a)	a)
		Applicable amount	
		Dec. 31, 2022	Jun. 30, 2022
1	Total assets as per published financial statements	627,041	658,657
2	Adjustment for entities that are consolidated for accounting purposes but are outside the scope of regulatory consolidation	-104,681	-108,976
3	(Adjustment for securitized exposures that meet the operational requirements for the recognition of risk transference)	-	-
4	(Adjustment for temporary exemption of exposures to central banks (if applicable))	-	-
5	(Adjustment for trust assets recognized on the balance sheet pursuant to the applicable accounting framework but excluded from the total exposure measure in accordance with article 429a (1) letter i CRR)	-	-
6	Adjustment for regular-way purchases and sales of financial assets subject to trade date accounting	-	-
7	Adjustment for eligible cash pooling transactions	-	-
8	Adjustment for derivative financial instruments	-839	10,818
9	Adjustment for securities financing transactions (SFTs)	1,784	1,576
10	Adjustment for off-balance-sheet items (i.e. conversion to credit equivalent amounts of off-balance-sheet exposures)	38,056	37,819
11	(Adjustment for prudent valuation adjustments and specific and general provisions that have reduced Tier 1 capital)	-	-
EU-11a	(Adjustment for exposures excluded from the total exposure measure in accordance with article 429a (1) letter c CRR)	-113,209	-112,790
EU-11b	(Adjustment for exposures excluded from the total exposure measure in accordance with article 429a (1) letter j CRR)	-	-
12	Other adjustments	-7,204	-7,384
13	**Total exposure measure**	**440,948**	**479,718**

Fig. 76 shows individual components of the total exposure measure, Tier 1 capital, and the DZ BANK banking group's resulting leverage ratio as at December 31, 2022, applying the CRR transitional guidance.

FIG. 76 – EU LR2 – LRCOM – LEVERAGE RATIO COMMON DISCLOSURE
(Article 451 (1) letters a, b, and c, article 451 (2) (up to row 28), and article 451 (3) (rows 28 to 31a) CRR)

Leverage ratio exposures			
		CRR leverage ratio exposures	
		a)	b)
€ million		Dec. 31, 2022	Jun. 30, 2022
On-balance-sheet exposures (excluding derivatives and SFTs)			
1	On-balance-sheet items (excluding derivatives and SFTs, but including collateral)	488,785	507,230
2	Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the applicable accounting framework	-	-
3	(Deductions of receivables assets for cash variation margin provided in derivatives	-9,520	-9,981
4	(Adjustment for securities received under securities financing transactions that are recognized as an asset)	-	-
5	(General credit risk adjustments to on-balance-sheet items)	-	-
6	(Asset amounts deducted in determining Tier 1 capital)	-499	-530
7	**Total on-balance-sheet exposures (excluding derivatives and SFTs)**	**478,766**	**496,719**
Derivative exposures			
8	Replacement cost associated with SA-CCR derivatives transactions (i.e. net of eligible cash variation margin)	20,961	25,190
EU-8a	Derogation for derivatives: replacement costs contribution under the simplified Standardized Approach	-	-
9	Add-on amounts for potential future exposure associated with SA-CCR derivatives transactions	10,562	11,415

Leverage ratio exposures

€ million		CRR leverage ratio exposures	
		a)	b)
		Dec. 31, 2022	Jun. 30, 2022
EU-9a	Derogation for derivatives: Potential future exposure contribution under the simplified Standardized Approach	-	-
EU-9b	Exposure determined under Original Exposure Method	-	-
10	(Exempted CCP leg of client-cleared trade exposures) (SA-CCR)	-11,470	-8,433
EU-10a	(Exempted CCP leg of client-cleared trade exposures) (simplified Standardized Approach)	-	-
EU-10b	(Exempted CCP leg of client-cleared trade exposures) (Original Exposure Method)	-	-
11	Adjusted effective notional amount of written credit derivatives	13,485	14,321
12	(Adjusted effective notional offsets and add-on deductions for written credit derivatives)	-11,312	-11,985
13	**Total derivatives exposures**	**22,226**	**30,508**
Securities financing transaction (SFT) exposures			
14	Gross SFT assets (with no recognition of netting), after adjustment for sales accounting transactions	25,475	37,604
15	(Netted amounts of cash payables and cash receivables of gross SFT assets)	0	0
16	Counterparty credit risk exposure for SFT assets	1,784	1,576
EU-16a	Derogation for SFTs: counterparty credit risk exposure in accordance with article 429e (5) and article 222 CRR	-	-
17	Agent transaction exposures	-	-
EU-17a	(Exempted CCP leg of client-cleared SFT exposures)	-	-
18	**Total securities financing transaction exposures**	**27,260**	**39,179**
Other off-balance-sheet exposures			
19	Off-balance-sheet exposures at gross notional amount	102,651	102,592
20	(Adjustments for conversion to credit equivalent amounts)	-64,596	-64,790
21	(General provisions deducted in determining Tier 1 capital and specific provisions associated with off-balance-sheet exposures)	-	-
22	**Off-balance-sheet exposures**	**38,055**	**37,802**
Excluded exposures			
EU-22a	(Exposures excluded from the total exposure measure in accordance with article 429a (1) letter c CRR)	-113,209	-112,790
EU-22b	(Exposures exempted in accordance with article 429a (1) letter j CRR (on-balance-sheet and off-balance-sheet))	-	-
EU-22c	(Excluded exposures of public development banks (or units) – public-sector investments)	-	-
EU-22d	(Excluded exposures of public development banks (or units) – development loans)	-	-
EU-22e	(Excluded development loan exposures passed through non-public development banks (or units))	-4	-4
EU-22f	(Excluded guaranteed parts of exposures arising from export credits)	-2,321	-1,940
EU-22g	(Excluded excess collateral deposited at triparty agents)	-	-
EU-22h	(Excluded CSD-related services of CSDs/institutions in accordance with article 429a (1) letter o CRR)	-	-
EU-22i	(Excluded CSD-related services of designated institutions in accordance with article 429a (1) letter p CRR)	-	-
EU-22j	(Reduction of the exposure value of pre-financing or intermediate loans)	-9,826	-9,755
EU-22k	**Total exempted exposures**	**-125,359**	**-124,489**
Tier 1 capital and total exposure measure			
23	**Tier 1 capital**	**20,912**	**21,504**
24	**Total exposure measure**	**440,948**	**479,718**
Leverage ratio			
25	Leverage ratio (%)	4.74	4.48
EU-25	Leverage ratio (excluding the impact of the exemption of public-sector investments and development loans) (%)	4.74	4.48
25a	Leverage ratio (excluding the impact of any applicable temporary exemption of central bank reserves) (%)	4.74	4.48
26	Regulatory minimum leverage ratio requirement (%)	3.00	3.00
EU-26a	Additional capital requirements to address the risk of excessive leverage (%)	-	-
EU-26b	of which: to be made up of CET1 capital	-	-
27	Leverage ratio buffer requirement (%)	-	-
EU-27a	Overall leverage ratio requirement (%)	3.00	3.00

Leverage ratio exposures

€ million		CRR leverage ratio exposures	
		a)	b)
		Dec. 31, 2022	Jun. 30, 2022
Choice of transitional guidance and relevant exposures			
EU-27b	Choice of transitional guidance for the definition of the capital measure	CRR transitional guidance	CRR transitional guidance
Disclosure of mean values			
28	Mean of daily values of gross SFT assets, after adjustment for sales accounting transactions and netted of amounts of associated cash payables and cash receivables	36,676	29,843
29	Quarter-end value of gross SFT assets, after adjustment for sales accounting transactions and netted of amounts of associated cash payables and cash receivables	25,475	37,604
30	Total exposure measure (including the impact of any applicable temporary exemption of central bank reserves) incorporating mean values from row 28 of gross SFT assets (after adjustment for sales accounting transactions and netted of amounts of associated cash payables and cash receivables)	452,148	471,958
30a	Total exposure measure (excluding the impact of any applicable temporary exemption of central bank reserves) incorporating mean values from row 28 of gross SFT assets (after adjustment for sales accounting transactions and netted of amounts of associated cash payables and cash receivables)	452,148	471,958
31	Leverage ratio (including the impact of any applicable temporary exemption of central bank reserves) incorporating mean values from row 28 of gross SFT assets (after adjustment for sales accounting transactions and netted of amounts of associated cash payables and cash receivables)	4.62	4.56
31a	Leverage ratio (excluding the impact of any applicable temporary exemption of central bank reserves) incorporating mean values from row 28 of gross SFT assets (after adjustment for sales accounting transactions and netted of amounts of associated cash payables and cash receivables)	4.62	4.56

The €38,770 million decrease in the DZ BANK banking group's total exposure measure in the reporting period was mainly due to the reduction in the volume of central bank exposures and in the volume of reverse repos on securities of DZ BANK.

Details of the main drivers of the change in Tier 1 capital can be found in section 5.3.1 of this report.

Fig. 77 provides an alternative breakdown by regulatory category of the exposures reported on the balance sheet.

FIG. 77 – EU LR3 – LRSPL – BREAKDOWN OF ON-BALANCE-SHEET EXPOSURES (EXCLUDING DERIVATIVES, SFTS, AND EXEMPTED EXPOSURES)
(Article 451 (1) letter b CRR)

Leverage ratio exposures		a)	
		CRR leverage ratio exposures	
€ million		Dec. 31, 2022	Jun. 30, 2022
EU-1	**Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures), of which:**	**358,213**	**381,805**
EU-2	**Trading book exposures**	**10,409**	**15,095**
EU-3	**Banking book exposures, of which:**	**347,804**	**366,710**
EU-4	Covered bonds	8,008	7,483
EU-5	Exposures treated as sovereigns	129,315	148,459
EU-6	Exposures to regional governments, multilateral development banks, international organizations, and public-sector entities not treated as sovereigns	1,416	1,885
EU-7	Institutions	13,874	13,419
EU-8	Exposures secured by mortgages on immovable property	99,038	97,844
EU-9	Retail exposures	19,859	19,413
EU-10	Corporates	56,735	58,089
EU-11	Exposures in default	1,475	1,500
EU-12	Other exposures (e.g. long-term equity investments, securitizations, and other non-credit-obligation assets)	18,084	18,617

12.2 Description of the process for monitoring the risk of excessive leverage

(Article 451 (1) letter d CRR)

In the strategic planning process, the Board of Managing Directors sets out the bank's overall strategy and the allocation of resources for the individual management units. The risk of excessive leverage is taken into consideration by reflecting the leverage ratio in the planning and management process. This involves monitoring compliance with internally defined thresholds on a monthly basis. Within these guidelines, the Asset/Liability Committee (ALCo) operates with the aim of optimizing the overall portfolio over the course of the year. Detailed plan-versus-actual analysis is carried out for all relevant management units on the basis of the bank's internal target to determine where the actual resource situation has deviated from the original projection. This process also highlights the factors driving these deviations. The latest changes to the leverage ratio and details of its influencing factors are reported on as part of DZ BANK's internal management reporting, which is an integral element of the bank's internal planning and management process. In its management role, the Asset/Liability Committee also identifies the action required and instigates mitigation steps or optimization measures. In this capacity, the Asset/Liability Committee makes decisions directly, issues recommendations or, if necessary, submits proposals on specific management actions to the Board of Managing Directors for adoption of a resolution.

13 Asset encumbrance

(Article 443 CRR)

According to the regulatory requirements in article 430 (1) letter g CRR and the requirements defined in Implementing Regulation (EU) 2021/451 dated March 19, 2021, the encumbered and unencumbered assets of the DZ BANK banking group have to be reported. The disclosure of asset encumbrance in this section is based on the requirements in Implementing Regulation (EU) 2021/637.

The encumbered and unencumbered assets are disclosed for the companies consolidated for regulatory purposes pursuant to article 18 CRR.

However, the disclosure of the quality of the encumbered and unencumbered assets ((E)HQLA) is based on the scope of consolidation used for liquidity purposes pursuant to article 18 (1) CRR. The differences between the scopes of consolidation are set out in section 3 of this report.

For the purposes of the DZ BANK banking group's reporting and disclosure, the carrying amounts of encumbered and unencumbered assets are calculated according to the provisions of International Financial Reporting Standards (IFRS). There are no significant differences between the calculation methods applied to the encumbered assets for the asset encumbrance reporting and to the assets presented in accordance with IFRS in the notes to the financial statements in the Annual Report that have been pledged or transferred.

Accordingly, assets that have been pledged as collateral or are the subject of any agreement to collateralize or credit enhance any on-balance-sheet or off-balance-sheet transaction must be treated as encumbered. In addition to the disclosures in the notes to the consolidated financial statements in the Annual Report, the DZ BANK banking group's cover pools held in trust and the derivative receivables in netting master agreements, for which there are equivalent derivative liabilities, are included as encumbered assets in the asset encumbrance reporting.

FINREP validation also takes place as part of asset encumbrance reporting. This ensures that the totals of the unencumbered and encumbered assets in the asset encumbrance reporting match those of the assets in the FINREP reporting.

The following disclosures are based on the DZ BANK banking group's asset encumbrance reporting in 2022. The carrying amounts and fair values of the encumbered and unencumbered assets are disclosed. The fair value of the (repledged) collateral received is disclosed. The median values of the values at the end of the past four quarters (reporting dates in 2022: March 31, June 30, September 30, and December 31) are presented for each line item. The totals are calculated from the median values of the values at the end of the past four quarters in the asset encumbrance reporting. Consequently, the totals disclosed may vary from the totals calculated from the individual values.

The DZ BANK banking group's asset encumbrance ratio for 2022 was 37.98 percent. This is the ratio of the median values shown for the totals of the encumbered assets recognized on the balance sheet plus collateral received and re-used to the median values for the total assets plus collateral received.

FIG. 78 – EU AE1 – ENCUMBERED AND UNENCUMBERED ASSETS AS AT DECEMBER 31, 2022 AND DECEMBER 31, 2021
(Article 443 CRR)

December 31, 2022

		Carrying amount of encumbered assets		Fair value of encumbered assets		Carrying amount of unencumbered assets		Fair value of unencumbered assets	
			of which: notionally eligible un-encumbered EHQLAs or HQLAs		of which: notionally eligible un-encumbered EHQLAs or HQLAs		of which: EHQLAs and HQLAs		of which: EHQLAs and HQLAs
€ million		010	030	040	050	060	080	090	100
					Dec. 31, 2022				
010	Assets of the disclosing	197,296	17,725			345,36	120,74		
030	Equity instruments	479	-	453	-	3,437	-	3,331	-
040	Debt securities	22,318	17,725	21,892	17,521	30,120	16,433	29,797	16,358
050	of which: covered bonds	6,629	5,952	6,561	5,906	3,153	2,203	3,177	2,210
060	of which: securitizations	499	-	492	-	1,361	1,129	1,235	1,129
070	of which: issued by general governments	8,116	7,536	7,971	7,383	8,671	7,403	7,965	7,245
080	of which: issued by financial corporations	12,730	9,368	12,533	9,318	16,810	7,567	17,850	7,556
090	of which: issued by non-financial corporations	1,472	821	1,387	820	3,820	1,277	3,575	1,280
120	Other assets	177,093	-			311,647	104,307		
121	of which: loans that can be terminated on demand	5,975	-			113,697	104,169		
122	of which: loans and advances other than loans that can be terminated on demand	157,457	-			180,787	-		

December 31, 2021

		Carrying amount of encumbered assets		Fair value of encumbered assets		Carrying amount of unencumbered assets		Fair value of unencumbered assets	
			of which: notionally eligible un-encumbered EHQLAs or HQLAs		of which: notionally eligible un-encumbered EHQLAs or HQLAs		of which: EHQLAs and HQLAs		of which: EHQLAs and HQLAs
€ million		010	030	040	050	060	080	090	100
		Dec. 31, 2021							
010	**Assets of the disclosing institution**	**195,431**	**25,517**			**316,664**	**107,092**		
030	Equity instruments	477	-	501	-	3,362	-	3,153	-
040	Debt securities	31,344	25,517	31,754	25,620	32,619	20,283	33,269	20,408
050	of which: covered bonds	7,949	6,933	8,011	6,940	3,492	2,698	3,518	2,707
060	of which: securitizations	651	-	644	-	1,253	671	1,191	671
070	of which: issued by general governments	12,840	12,061	12,932	12,129	12,182	10,128	11,381	10,224
080	of which: issued by financial corporations	16,084	11,955	16,278	11,989	16,496	8,404	17,956	8,431
090	of which: issued by non-financial corporations	2,354	1,433	2,478	1,435	3,835	1,395	3,786	1,401
120	Other assets	163,651	-			280,555	86,318		
121	of which: loans that can be terminated on demand	3,902	-			95,722	86,163		
122	of which: loans and advances other than loans that can be terminated on demand	146,187	-			163,515	-		

FIG. 79 – EU AE2 – COLLATERAL RECEIVED AND OWN DEBT SECURITIES ISSUED
(Article 443 CRR)

€ million		Fair value of encumbered collateral received or own debt securities issued	of which: notionally eligible unencumbered EHQLAs and HQLAs	Unencumbered – Fair value of collateral received or own debt securities issued available for encumbrance	of which: EHQLAs and HQLAs	Fair value of encumbered collateral received or own debt securities issued	Unencumbered – Fair value of collateral received or own debt securities issued available for encumbrance
		010	030	040	060	010	040
		Dec. 31, 2022				Dec. 31, 2021	
130	Collateral received by the disclosing institution	20,744	18,211	10,660	6,109	17,956	8,634
140	Loans that can be terminated on demand	-	-	-	-	-	-
150	Equity instruments	5	-	2,555	-	16	1,700
160	Debt securities	20,738	18,211	8,066	6,109	17,944	6,912
170	of which: covered bonds	2,013	1,465	1,717	1,142	1,505	1,072
180	of which: securitizations	-	-	-	-	-	-
190	of which: issued by general governments	13,705	13,444	4,380	4,247	14,235	3,320
200	of which: issued by financial corporations	4,735	3,250	3,228	1,806	3,817	3,229
210	of which: issued by non-financial corporations	96	63	438	131	266	407
220	Loans and advances other than loans that can be terminated on demand	-	-	-	-	-	-
230	Other collateral received	1	-	257	-	-	36
240	Own debt securities issued other than own covered bonds or securitizations	-	-	6,535	-	-	6,195
241	Own covered bonds and securitizations issued and not yet pledged			744	-		780
250	Total collateral received and own debt securities issued	215,276	37,123			213,387	

FIG. 80 – EU AE3 – SOURCES OF ENCUMBRANCE
(Article 443 CRR)

€ million		Matching liabilities, contingent liabilities, or securities lent	Encumbered assets, encumbered collateral received, and encumbered own debt securities issued other than covered bonds and ABSs	Matching liabilities, contingent liabilities, or securities lent	Encumbered assets, encumbered collateral received, and encumbered own debt securities issued other than covered bonds and ABSs
		010	030	010	030
		Dec. 31, 2022		Dec. 31, 2021	
010	**Carrying amount of selected financial liabilities**	**185,734**	**210,637**	**185,331**	**207,624**
011	of which: derivatives	12,134	18,944	14,408	17,782
012	of which: deposits	137,606	147,971	137,355	147,479
012a	of which: sale and repurchase agreements	2,183	2,659	8,364	8,808
012b	of which: collateralized deposits excluding repurchase agreements	135,227	145,141	130,292	139,689
013	of which: bonds issued	35,965	46,932	33,240	40,888

The year-on-year increase in encumbrance in 2022 was mainly attributable to collateralized deposits (Fig. 81, row 012b) and was due to a higher volume of development loans and a rise in covered bond issues (row 013). This increase was partly offset by a decline in encumbered sale and repurchase agreements (Fig. 81, row 012a). The increase in unencumbered assets, particularly loans and advances, was more pronounced than the increase in encumbered assets, resulting in a fall in the asset encumbrance ratio.

Table EU AE4 – Accompanying narrative information

(Article 443 CRR)

The business model's influence on the degree of encumbrance and the importance of encumbrance to the DZ BANK banking group's funding model are explained below. The DZ BANK banking group's main sources of encumbrance result from the following business activities:

– DZ BANK and DZ HYP obtain some of their funding by issuing covered bonds. The corresponding cover pools of these institutions led to encumbrance of €75,303 million in 2022. The average weighted overcollateralization ratio for the DZ BANK banking group's cover pools was 32.2 percent in 2022. This overcollateralization comprised the excess cover required by law, the excess cover required by the rating agencies, and the voluntary excess cover; it contributed €18,361 million to the aforementioned total encumbrance.

– The entities in the DZ BANK banking group hold covered bonds issued by other group entities, for which there is a corresponding cover pool volume of €3,339 million. From a consolidated group perspective, these assets do not result in asset encumbrance.

– In addition to the cover pools, development lending business with cooperative banks and end customers represents another material factor in the DZ BANK banking group's encumbrance ratio, with pass-through loan receivables of €76,335 million assigned to development banks. This volume of encumbrance is mainly attributable to business at DZ BANK and DZ HYP and is shown under encumbered loans and advances, which make up the largest share of the other assets in row 120 of template EU AE1 (Fig. 78).

– Securities lending transactions and funding via sale and repurchase agreements are further major sources of encumbrance for the DZ BANK banking group and predominantly result from transactions of DZ BANK, DZ PRIVATBANK, and DZ HYP.

- Both unsecured derivative transactions with netting master agreements (International Swaps and Derivatives Association (ISDA) and Deutscher Rahmenvertrag (DRV) [German Master Agreement]) and derivative transactions backed by collateral agreements (Credit Support Annex to the ISDA Master Agreement and Collateralization Annex to the German Master Agreement for Financial Futures) are considered to be encumbrances.
- The longer-term funding of DZ BANK and DZ HYP in the form of open-market operations via central banks results in additional encumbrance of assets-side business.

There are also assets that are encumbered because they are pledged to entities in the DZ BANK banking group. In particular, they arise from sale and repurchase agreements, derivative transactions backed by collateral agreements, and covered bonds held within the group. The main reason for conducting these transactions is the centralized provision of funding to the individual subsidiaries by DZ BANK (group funding). All transactions between entities in the DZ BANK banking group are recognized on a consolidated basis at group level.

The DZ BANK banking group's own securitizations (asset-backed securities, ABSs) were not relevant to the entities consolidated for regulatory purposes in 2022 and therefore do not represent a source of encumbrance for the purpose of asset encumbrance reporting.

The majority of the DZ BANK banking group's encumbered assets are denominated in euros. There are also encumbered assets denominated in US dollars, which is also deemed a significant currency for the DZ BANK banking group. The encumbered assets denominated in US dollars mainly result from derivatives business and from the issuance of covered bonds. The volume of encumbered assets denominated in US dollars stood at €1,512 million as at December 31, 2022. US-dollar-denominated collateral received and re-used amounted to €76 million. The sources of encumbrance denominated in US dollars came to €779 million.

The majority of the unencumbered securities in the portfolios of the DZ BANK banking group are eligible for central bank borrowing and are available in the normal course of business as collateral for potential encumbrance. The unencumbered other assets line item includes assets such as property, plant and equipment, long-term equity investments and investments in other entities, intangible assets, deferred tax assets, and unencumbered derivatives that are not available in the normal course of business for potential encumbrance.

Within the total encumbered loans and advances (Fig. 78, row 122), which are part of the other assets in row 120 in table EU AE1, the volume of encumbered mortgages amounted to €46,373 million in 2022. Encumbrance predominantly results from the issuance of covered bonds by DZ BANK and DZ HYP.

14 Disclosure of ESG risks

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453)

14.1 Principles and definitions for ESG risks

DZ BANK is a large institution whose securities are admitted to trading on a regulated market in the EU, which means it must satisfy the disclosure requirements on environmental, social and corporate governance (ESG) risks pursuant to article 449a CRR. Article 449a CRR itself does not formulate any specific requirements regarding the content of the disclosure of ESG risks. Instead, it makes reference to the requirements in article 98 (8) CRD, which, in line with article 434a CRR, gives the EBA a mandate to develop an implementing technical standard (ITS). EBA/ITS/2022/01, which was developed by the EBA, forms the basis for Implementing Regulation (EU) 2022/2453[1]. This regulation defines the standard formats for the disclosure of ESG risks under Pillar III and the related instructions for the disclosure information. This includes qualitative information on the integration of environmental, social, and corporate governance risks into the business strategy and business processes, corporate management, and risk management. Quantitative information on climate change transition risk (ESG templates 1 to 4), climate change physical risks (ESG template 5), and mitigating actions (ESG templates 6 to 10) must be disclosed. In addition to the general disclosure requirement for the DZ BANK banking group, which applies for the first time as at December 31, 2022, there are also individual transitional periods for selected topics. Consequently, templates 6 to 9 will only be disclosed for the first time as at future reporting dates in accordance with these transitional periods.

The DZ BANK banking group defines ESG risks in accordance with the Guidance Notice on Dealing with Sustainability Risks issued by BaFin and in line with Implementing Regulation (EU) 2022/2453. ESG risks are defined as events or circumstances in the climate-related and environmental, social, or corporate governance spheres that, if they materialized, would definitely or potentially have an adverse impact on the financial position and financial performance, liquidity situation, and reputation of a company. ESG risks are also referred to as sustainability risks below.

In the climate-related and environmental sphere, this typically comprises both physical climate-related and environmental risks (e.g. acute natural and climate disasters such as floods or irreversible climate change) and transition risks in connection with the switch to more environmentally friendly economic practices with a smaller carbon footprint.

The DZ BANK banking group does not classify ESG risks as a risk type in their own right. In accordance with the regulatory definitions, it instead views them as drivers of the classic financial and non-financial risk types (risk factors/drivers). Risk factors are based on, for example, economic, societal, and (geo)political events and conditions. Sustainability risks have an impact on various risk categories because they bring about a change in the risk factors.

14.2 Qualitative information on ESG risks

14.2.1 Description of governance

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 1 rows e to i, table 2 rows d to g)

ESG risks are managed centrally at the level of the DZ BANK banking group and on a decentralized basis at the level of the subsidiaries. At the level of DZ BANK, the Advancing Sustainability program was initiated in 2022 under the leadership of the Co-Chief Executive Officers (Co-CEOs). The programs consists of six topic-based individual projects that focus on the following:

[1] Commission Implementing Regulation (EU) 2022/2453 dated November 30, 2022 amending the implementing technical standards laid down in Implementing Regulation (EU) 2021/637 as regards the disclosure of environmental, social and corporate governance risks.

- Program management and coordination in the group and cooperative financial network
- Strategic focus topics
- Carbon accounting and risk classification
- Sector strategies and lending processes
- Risk management, including stress tests and reporting
- Data infrastructure and IT infrastructure

The program is continuing in 2023 with an updated project structure.

The central bodies formed to enable the groupwide management of sustainability matters by the members of the Boards of Managing Directors of DZ BANK and the management units are the Group Risk and Finance Committee (GRFC) and, with effect from January 1, 2023, the Group Sustainability Committee (GSC). The GSC replaces the Group Corporate Responsibility Committee (GCRC), which in 2022 served as a platform at head of division level for sharing specialist information throughout the group about the latest sustainability-related trends and activities and identified key issues and joint projects relevant to the whole of the group. Its members also included the subsidiaries' sustainability coordinators.

The responsibilities of the two bodies relevant to the management of sustainability matters in the DZ BANK Group[2] are as follows:

a. Group Risk and Finance Committee: The GRFC is the central committee in the DZ BANK Group responsible for proper operational organization, particularly risk management. It assists DZ BANK with groupwide financial and liquidity management, risk capital management, and recovery and resolution planning. It also supports the Group Coordination Committee (GCC) in matters of principle. The members of the GRFC include the relevant executives at DZ BANK responsible for finance, risk, and treasury, plus an executive from each of the other entities in the DZ BANK Group.
b. Group Sustainability Committee: The GSC is the central committee that manages the implementation of societal, business-policy, and regulatory requirements relating to sustainability matters in the DZ BANK Group. The GSC maintains an overview of all sustainability-specific decision-making of relevance to the group, helps the entities in the DZ BANK Group to manage, communicate, and coordinate sustainability matters, and formulates strategic input. Among its members are DZ BANK's Co-CEOs and the members of the Boards of Managing Directors with responsibility for sustainability at the material subsidiaries. The GSC reports regularly to the Group Coordination Committee, the highest-level management and coordination committee in the DZ BANK Group. The GSC is supported by the sustainability coordination committee, which – under the direction of DZ BANK – prepares the decisions to be made by the GSC.

In the group parent entity, DZ BANK, the coordination of sustainability matters is carried out in the Strategy & Group Development division and is the responsibility of the two Co-CEOs. The risk management function in the group parent entity is managed by the member of the Board of Managing Directors responsible for risk (Chief Risk Officer, CRO), which also involves the short-, medium-, and long-term management of climate-related, environmental, and other sustainability risks as risk factors for the traditional risk types. ESG risks are covered by the risk management processes used to manage and report on traditional financial and non-financial risks.

The governance model for the DZ BANK Group's risk appetite framework (RAF) is the established three-lines-of-defense model, which also applies to ESG risks as they are risk factors for traditional financial and non-

[2] Including R+V Versicherung.

financial risks. The responsibilities and tasks relating to sustainability risks are based on the same allocation of roles as used in the established three-lines-of-defense model. Further details of the DZ BANK Group's three-lines-of-defense model can be found in section 2.1.3.

The first line of defense manages the sustainability risks that it has assumed (see also section 14.2.3). In the second line of defense, ESG risks are taken into account in the risk management processes for the material risk types and in the context of the compliance function.

Internal audit, which is the third line of defense, examines the appropriateness of the arrangements for managing sustainability risks as part of its audit schedule. To this end, a dedicated audit area, 'compliance with sustainability obligations' has been established and is audited regularly. The fulfillment of sustainability obligations is also assessed as part of subject-specific audits. Furthermore, Group Audit monitors ongoing project activities with regard to the implementation of sustainability aspects.

The ESG risk factors are integrated into the reporting process because they are covered within the individual risk types. For the first time as at December 31, 2022, the reporting on ESG risks to senior management – in particular, portfolio information for sectors that are of particular importance with regard to sustainability – was brought together in a sustainability risk report for the DZ BANK Group.

The inclusion of sustainability criteria in the remuneration policy is explained in section 15.2.3.

14.2.2 Description of business strategy and processes

14.2.2.1 Overarching business strategy

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 1 rows a to d, table 2 rows a to c)

For the DZ BANK Group, sustainability is an integral part of the values that it embodies and the activities that it carries out as the central institution in the cooperative financial network. To this end, it updates the groupwide sustainability strategy on an ongoing basis with the aim of contributing to the transition to a sustainable economy. Where possible and depending on their business model, the DZ BANK Group provides its customers with targeted support for their transformation. For example, sustainability aspects are factored into business decisions, both in terms of the positive impact on sustainable business and with regard to potential sustainability risks.

The DZ BANK Group has adopted this role of supporting customers' transformations because the sustainable transformation of the economic system is mostly a time-consuming and expensive, long-term process of change. This positioning also helps to reduce or mitigate potential sustainability transition risks in the DZ BANK banking group's business. To further underline this position, DZ BANK has made voluntary commitments to various initiatives, such as the Principles for Responsible Banking (PRB), the Task Force on Climate-related Financial Disclosures (TCFD), the Net Zero Banking Alliance Germany, and the collective commitment to climate action of the German financial sector.

DZ BANK uses an internal classification tool based on the 17 sustainable development goals (SDGs) of the United Nations to assess the sustainability of the lending business. The tool measures the positive and adverse SDG impacts of DZ BANK's business from an ESG perspective. This primarily relates to the traditional corporate customer lending business in Corporate Banking and Structured Finance, in which the positive impacts outweigh the adverse impacts overall. Building on this, DZ BANK has set itself the target of increasing the positive SDG impacts so that they cover two-thirds of the volume of the aforementioned lending to corporate customers by 2026.

This represents one of the main strategic responses to potential sustainability risks at overarching level because sustainability impacts (in the form of SDG impacts in this context) can be a possible indicator of sustainability transition risks and their mitigation.

Furthermore, DZ BANK's Board of Managing Directors has defined goals that can be tangibly measured on the basis of key performance indicators and are published in the Sustainability Report. This includes quantitative goals as well as improving the quality of every aspect of ESG within the organization. The Board of Managing Directors and the Supervisory Board are updated regularly on progress with the achievement of these goals. The ESG goals were achieved in 2022. In addition to the aforementioned target for positive SDG impact coverage, the overarching goals also include permanently maintaining or improving the positive external ESG ratings awarded by ISS (C+ | prime status) to the DZ BANK Group and by MSCI (AA) to DZ BANK.

As part of the annual strategic planning process (SPP), the group entities define their business strategy including the strategic direction, objectives, and measures. These plans are discussed in strategic dialogue sessions at the level of the Board of Managing Directors and then taken forward to the consolidated group planning stage, which involves the development of the business strategy for the DZ BANK Group. The strategic planning is based on various macroeconomic scenarios that are analyzed in terms of material influencing factors and climate-related parameters and are reviewed regularly.

In the strategic planning process, steps are taken to ensure that the business strategy and the risk strategies are consistent with each other. When these risk strategies are defined, the factors taken into account include material climate-related and environmental risks.

The strategic positioning of the overall bank and the role of the divisions in supporting customers' transformation is discussed at DZ BANK as part of the strategic dialogues with the Corporate Banking, Capital Markets, and Transaction Banking business lines. Important key figures and business environment analyses are also discussed in the context of climate-related, environmental, and social risks.

In terms of the possible time horizons, a distinction is made between short-term (up to one year), medium-term (up to and including four years), and long-term (five years or more) risks. Typically, reputational risk drivers are particularly relevant in the short term, transition risk drivers in the medium term, and physical risk drivers in the long term.

14.2.2.2 Climate-related and environmental risks

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 1 rows a to d)

Climate-related transition risks are important risk factors. They may occur, in particular, if counterparties in industries with particular relevance to climate change do not transition to the necessary extent or with the necessary speed. The causes of such risk include political conditions and transformation targets (e.g. Paris climate agreement, German Climate Change Act (KSG)), resulting measures (e.g. carbon tax, building efficiency guidelines), changes in consumer preferences, and the accompanying technological shift. As a result, climate-related transition risks have a big impact on the DZ BANK Group's customers and, in turn, have an indirect impact on the DZ BANK Group too. The medium-term nature of these effects means that they may be particularly relevant to the lending business. Moreover, business models that are particularly harmful to the climate can create risks for customers. They can also lead to reputational risk for the DZ BANK Group where it provides finance or establishes other types of business relationship. As part of its investment strategy, DZ BANK manages the bonds in its banking book from a sustainability perspective too so as to mitigate climate-related and environmental risks. Further information can be found in the explanations relating to ESG template 10 (Fig. 88) in section 14.3.

In accordance with the Paris climate agreement, DZ BANK is striving to align its portfolio with a net-zero future and the 1.5 degree target in order to address these risks. To this end, DZ BANK carried out sector sprints for sectors of material relevance to climate change in 2022. This involved in-depth analysis of these sectors with regard to market opportunities, climate-related and environmental risks, and decarbonization. This resulted in three main strategic responses:

- Decarbonization targets for the automotive, energy, steel, cement, and aviation sectors. The quantified targets are set out in ESG template 3 (Fig. 84). These targets are aimed at aligning the relevant sector portfolios with the Net Zero Emission 2050 scenario (NZE) of the International Energy Agency (IEA). This is starting from the base year of 2022, when DZ BANK's banking book was well below the IEA NZE's target levels for 2022 in four of the five sectors.[3] The plan for the future is to extend the targets to the banking book of the DZ BANK banking group.
- The existing risk limits in sectors of relevance to climate change were examined and additions were made where required.
- Identification of opportunities for helping DZ BANK's customers in selected (sub-)sectors with their climate transformation. The main focus here is funding for renewable energies. DZ BANK has therefore set itself the target of increasing the volume from the current amount of €6.5 billion[4] to €7.1 billion by 2026.[5]

In addition, potential climate-related and environmental risks resulting from exposures to customers or activities with a particularly adverse impact are excluded from the outset by applying rejection criteria and sectoral rules.

DZ BANK's rejection criteria primarily relate to the following activities and types of business:

- Thermal coal
- Oil or gas extraction by means of fracking or from oil shale or tar sands
- Mining activities using the mountaintop removal method
- Trading of endangered animal or plant species
- Significant threats to the environment

With regard to applying sectoral rules for sectors that are particularly vulnerable from a sustainability perspective, the main focus is on the following aspects:

- Dam construction
- Commodities mining/extraction in general
- Agriculture
- Forestry
- Fishing
- Maritime industry
- Palm oil production

The DZ BANK Group has developed specific rejection criteria for the lending business. The criteria are binding and apply throughout the group. Every lending exposure must be examined from a sustainability perspective. As a result of the greater focus on ESG aspects, the rejection criteria are reviewed on an ongoing basis and are amended and/or expanded as necessary. The 'Rejection criteria of the DZ BANK Group' principles were adopted at the end of 2022 and are very similar to DZ BANK's rejection criteria.

[3] The sole exception was the cement sector, which, at 3 percent in 2022, was only minimally above the reference pathway.
[4] Lending volume, including off-balance-sheet exposures.
[5] A target for Union Investment's asset management portfolio was also defined. Using the new calculation method in line with Union Investment's sustainability objectives, the volume of sustainable assets under management of €81.2 billion as at December 31, 2022 is to be raised to €89.7 billion by December 31, 2023.

By signing up to the UN Global Compact in 2008, the DZ BANK Group committed to ten universally accepted principles of responsible conduct in relation to human rights, labor standards, environmental protection, and the fight against corruption. DZ BANK has also undertaken to comply with other voluntary frameworks, such as the Equator Principles and the Performance Standards of the International Finance Corporation (IFC). All factors of relevance to a financing arrangement are assessed in relation to social, ethical, and environmental risks using a sustainability checklist that is based on the 10 principles of the UN Global Compact. Project finance and eligible project-specific corporate finance transactions are also checked for compliance with the World Bank's IFC Performance Standards using a questionnaire that is aligned with the Equator Principles. This enables possible negative environmental impacts, including on biodiversity, of project finance or trade finance transactions to be identified and the potential resulting risks to be mitigated.

14.2.2.3 Social risks

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 2 rows a to c)

Social risks arise as a result of inadequate standards for upholding basic rights and protecting against discrimination, or unfair, opaque, or improper customer practices. These risks can cause reputational damage that may lead to changes in customer behavior or demand in the long term. They may also have a financial impact as a result of ineffective or even disruptive business processes, the loss of key employees and, ultimately, financial claims and liabilities caused by inappropriate practices.

Social aspects are potential risk factors both at portfolio level and at operational level. At portfolio level, one of the main sources of social risk is disregard for human rights and labor standards by customers of the DZ BANK banking group or its partners in the value chain (e.g. use of child labor, inadequate working conditions, disregard for the rights and interests of local and indigenous communities). These violations could result in legal and reputational risks for the DZ BANK banking group in its capacity as a lender.

Consequently, DZ BANK excludes exposures with a particularly adverse social impact – and the related potential risks – from the outset by applying rejection criteria and sectoral rules. These primarily relate to adverse impacts and potential risks resulting from the following activities:

- Violations of internationally accepted frameworks concerning human rights and labor rights, including the UN Global Compact, the UN Guiding Principles on Business and Human Rights, and the ILO fundamental conventions
- Controversial weapons
- Arms trading in/to certain countries
- Pornography industry or similar sectors and controversial gambling
- (In)direct corruption or other inappropriate acceptance/granting/demanding of advantages
- Disregard for the rights and interests of indigenous or local communities
- Non-compliance with human rights and labor rights in particularly sensitive sectors (e.g. in terms of commodities mining/extraction or activities linked to palm oil or fishing)

Possible adverse social impacts and potential resulting risks are assessed and mitigated by taking account of the principles of the UN Global Compact in the general sustainability checklist and taking account of the Equator Principles and the IFC Performance Standards in the checklist for project-specific finance transactions.

The rejection criteria that were explained in section 14.2.2.2 at the level of the DZ BANK Group also include rejection criteria in respect of possible social risks. Among the groupwide rejection criteria are business activities involving the production or trading of controversial weapons. Examples of controversial weapons are anti-personnel mines as defined by the Ottawa Convention, nuclear/biological/chemical weapons as defined by the Geneva Protocol, and cluster munitions as defined by the Oslo Convention. Furthermore, the DZ BANK

Group does not provide finance in the pornography industry or similar sectors (sex industry) or for controversial forms of gambling. The DZ BANK Group does not provide finance in business relationships with customers where there are indications of significant breaches of human rights or environmental standards. In addition, DZ BANK considers social aspects in its investment strategy for bonds. As at December 31, 2022, the volume of social bonds in its portfolio stood at €345.8 million.

Social risk factors at operational level can arise, for example, from potentially poor employer branding (e.g. due to a lack of continuing professional development (CPD) opportunities, employee dissatisfaction, little support for diversity and inclusivity) and result in insufficient availability of skilled personnel. To counteract these risks, DZ BANK addresses social risk factors in its operations by taking a range of steps, such as:

- Various support and CPD activities for employees
- Code of conduct and processes for avoiding discrimination
- Specific quantitative targets to increase the number of women in management committees at DZ BANK (DZ BANK Board of Managing Directors, Supervisory Board, and other management levels, DZ BANK Group Board of Managing Directors)
- Various measures designed to ensure employee satisfaction (target: Organizational Commitment Index score of over 70 percent)

Social risk factors can also arise in the DZ BANK banking group's supply chain (e.g. labor standards) that may give rise to legal risk and reputational risk. DZ BANK and BSH are addressing potential social risks in their own supply chains and operations by implementing the German Supply Chain Due Diligence Act (LkSG) and have each appointed human rights officers. All entities in the DZ BANK Group require their suppliers to comply with minimum standards as specified in the 'Sustainability requirements for suppliers to the DZ BANK Group'. These are aligned with sources such as the principles of the UN Global Compact, the code of conduct issued by the Bundesverband Materialwirtschaft, Einkauf und Logistik e. V. (BME) [German Association for Supply Chain Management, Procurement and Logistics], and the fundamental conventions of the ILO.

14.2.3 Description of risk management

14.2.3.1 Climate-related and environmental risks

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 1 rows j to r)

ESG risks constitute risk factors for classic financial and non-financial risk types, and these risk factors are subject to a separate materiality assessment in the DZ BANK Group. The ESG risk factors included in the materiality analysis were examined from a risk perspective (e.g. for transition risks and physical risks) and from an impact perspective (e.g. regarding potential reputational risk) as both perspectives may be relevant to the bank.

The assessment of the materiality of risk factors is based on sensitivity analysis that looks at the materiality of potential transmission channels. If a quantitative assessment is not possible, expert appraisals are used. The findings are presented in the form of a materiality matrix (see Fig. 81).

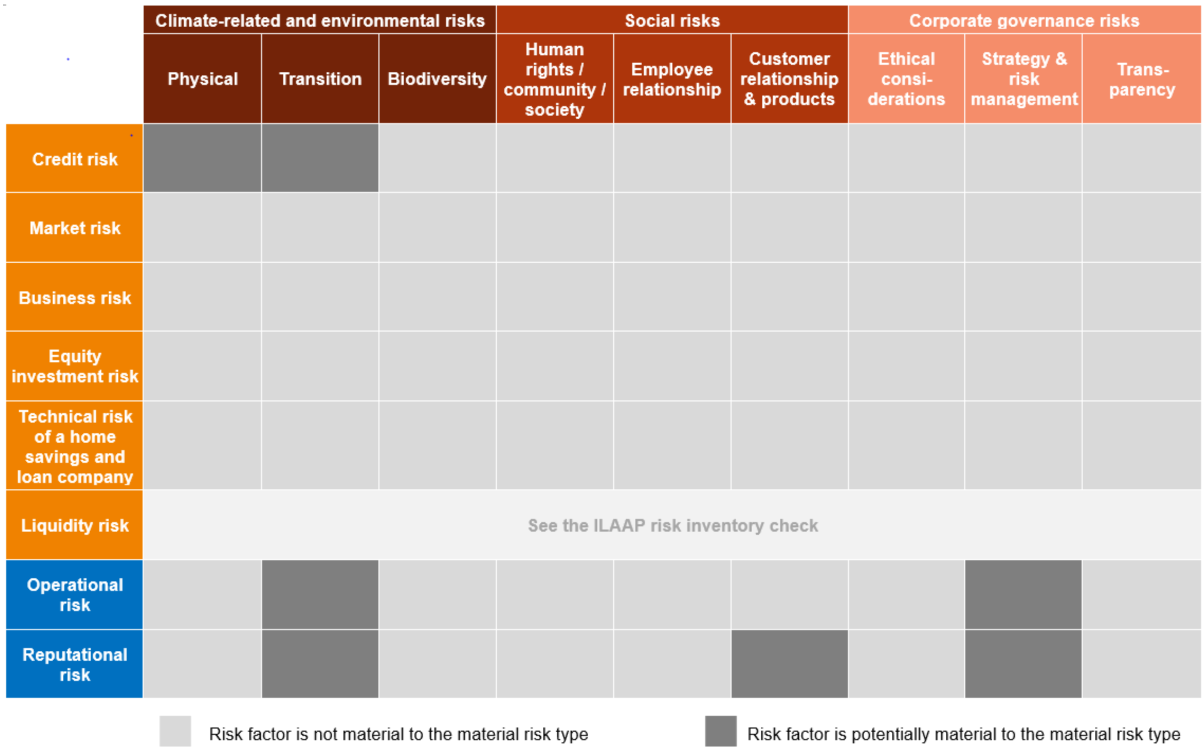
The applicable time horizon is also relevant for sustainability-related risk factors. Whereas some sustainability risk factors can have an effect in the short to medium term (e.g. extreme weather events, such as flooding, or statutory/regulatory changes), others (e.g. permanent climate change) take effect over a much longer time horizon. In line with the ICAAP economic perspective, the DZ BANK Group considers a short-term time horizon to be one year. The DZ BANK Group considers a medium-term horizon to be four years, which is consistent with its planning horizon. It takes account of a baseline scenario and at least one risk scenario for this period. As part of the annual strategic planning process, the scenarios are applied both to the financial planning and to the planning of risk-bearing capacity from an economic perspective. Longer periods are regarded as long term. Strategic risk management is based on long time scales for which strategies and long-term planning are formulated and that focus on risk factors. It is underpinned by the consideration that every (business) strategy-related decision affects the DZ BANK Group's risk profile.

Stress tests and other instruments are used to check the resilience of the strategy to adverse developments. DZ BANK continually updates the data and procedures for climate stress tests and has been progressively introducing internal climate stress tests across the group since 2022. The first internal report on exploratory scenario analysis for assessing selected physical and transition climate-related risks was produced at the end of the year. Further rules for the DZ BANK Group's risk appetite framework, which focuses on decisions about specific transactions, are derived from the strategy. Risk factors and risk types at operational level influence the formulation of these rules. The relevant periods are determined by the term of the customer and own-account transactions carried out.

At operational level, sustainability risks have an effect via the various risk factors (e.g. credit ratings, collateral values, volatility, claims from operational risks, and correlations between risk types). If necessary, models and processes used in operational risk management are further developed with regard to sustainability risks where there are indications that new risks exist or if, within the time horizon in question, the future risk modeling values deviate significantly from the historical values owing to sustainability risks.

The integration of sustainability risks into the strategic and operational risk management framework – and any necessary further development of the DZ BANK Group's related methods and processes – is heavily dependent on whether the ESG risk factor's influence on a risk type is considered material. The potential materiality of ESG risks to the material risk types in the DZ BANK Group is examined by analyzing the ESG risks factors as part of the groupwide ICAAP risk inventory check. This inventory check is backed up by quantitative data. The assessment of materiality is based on concentration analysis at portfolio level; for individual risk types, it is based on expert appraisals from the group's points of contact. For this purpose, the three sustainability dimensions (climate-related and environmental risks, social risks, and corporate governance risks), were divided into three risk factor categories. The following figure shows the results of the analyses for 2022. In addition, ESG risk drivers are examined with regard to the DZ BANK Group's liquidity risk as part of the annual ILAAP risk inventory check.

FIG. 81 – ASSESSMENT OF POTENTIAL MATERIALITY BASED ON THE 2022 ANALYSIS OF THE ESG RISK FACTORS



Customers' greenhouse gas emissions are a relevant input factor for the management of transition risks. For some of DZ BANK's customers, however, this data is not yet obtainable from publicly available information. In 2022, work was started to develop a method for determining a customer's greenhouse gas emissions for various objectives, e.g. as input for calculating the ESG score (see the explanations on the ESG risk scorecard in the following section on credit risk) based on revenue intensity and for the disclosure of financed emissions. This method takes account of general data availability.

The calculation of greenhouse gas emissions (the customer's total emissions (scopes 1–3) for all greenhouse gases specified in the Kyoto Protocol[6] in CO_2 equivalents (CO_2e)) is based on the standards of the Partnership for Carbon Accounting Financials (PCAF). Under the model, the way in which greenhouse gas emissions are determined depends on the availability of data. Preferably, directly collected emissions data or externally published emissions data[7] is used in the calculations. However, if published information is not available, the customer-specific emissions are determined using bottom-up or regression models[8] or using granular sector-specific and country-specific average values.[9]

Relative revenue intensity is used in the ESG risk scorecard and is calculated as the absolute greenhouse gas emissions of a counterparty relative to the entity's emissions. External data sources are used to supplement the revenue data available internally (e.g. S&P CapitalIQ Pro[10] and Orbis[11]).

Credit risk

Climate-related and environmental risks have an effect via various transmission channels and may adversely impact on – and compound – credit-related risks. This is due to underlying generally cross-sectoral or sector-specific risk factors that have a direct or indirect influence on, for example, the borrower's financial

[6] The following greenhouse gases are relevant under the Kyoto Protocol: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
[7] Based on S&P CapitalIQ Pro, Copyright © 2023, S&P Global Market Intelligence.
[8] Based on reported emissions from Refinitiv (part of the London Stock Exchange Group) and revenue figures from Orbis (Bureau van Dijk / Moody's Analytics).
[9] Based on macroeconomic data from Oxford Economics and emissions data from Exiobase.
[10] Copyright © 2023, S&P Global Market Intelligence.
[11] Orbis database from Bureau van Dijk (Moody's Analytics).

circumstances and can thus lead to a higher probability of default, deterioration in the credit rating of the counterparty (borrowers, issuers, other counterparties), or losses in connection with the recovery of loans, advances, receivables, or collateral. The degree to which the different management units are affected depends on their individual business model.

In the DZ BANK banking group, the credit check and credit control processes include an analysis of the climate-related and environmental risks in relation to the borrower, the loan or the item being financed, and the collateral provided. This analysis is based on financial circumstances and thus on the borrower's debt service capacity. For transactions with a total exposure above €10 million, DZ BANK also assesses the borrower's credit risks associated with ESG factors separately in its lending decision.

DZ BANK has developed an ESG risk scorecard for the purpose of identifying, quantifying, and evaluating climate-related and environmental risks in the lending business.[12] The ESG risk scorecard will show a customer's sustainability risk classification and evaluate the customer-specific transition risks and the sector-specific risks from a social and corporate governance perspective. Integration of the ESG risk scorecard into the credit risk management process has been progressively trialed in selected sectors since the end of 2022 and is to be rolled out over the course of 2023. The ESG risk scorecard should be seen as a supplement to the traditional credit ratings and reflects the medium-term strategic rating outlook with regard to climate-related and environmental risks. The individual customer's rating outlook is examined to ascertain whether it is better than, similar to, or worse than the average for the sector in question. ESG risk scores thus add a further dimension to lending decision processes and their management.

In order to incorporate ESG aspects into the lending process, the ESG checklist will address relevant aspects of the risk factor 'climate-related and sustainability risks' going forward, supplementing the sustainability checklist described in section 14.2.2.2. For each question, there are two to four possible answers to reflect varying degrees of response. In the 'environmental' dimension, the questions cover topics such as voluntary undertakings, compliance with environmental laws, and the implementation of sustainable technologies and measures. The answers selected generate an interim score for the 'environmental' dimension. The ESG checklist is also currently being trialed and is due to be integrated into the lending process in 2023.

The real estate finance providers in the DZ BANK Group mainly classify risk at asset level. DZ HYP uses an internal E-score to analyze and assess physical climate-related and environmental risks for all collateral assets. An E-scorecard is also used to determine physical and transition risks for all collateral assets. At BSH, physical and transition (EPC categories) risks in the existing credit portfolio are regularly monitored, in particular because properties with poor energy efficiency are exposed to heightened transition risk, for example due to statutory requirements regarding building renovation.

In line with regulatory requirements, a borrower's material climate-related and environmental risks are listed and taken into account by the market and credit departments in the loan application and lending decision processes at DZ BANK. Loan collateral may potentially be affected by sustainability risks, particularly climate-related and environmental risks. These risk factors can have an adverse impact on a property's LGD in the form of physical risks, such as damage to the building as a result of extreme weather events. Transition risks can also reduce the value of real estate, e.g. due to requirements governing energy efficiency improvements, changes in market preferences (demand for energy-efficient buildings), or the macroeconomic situation (structural change and thus shifts in regional demand for property). Updates to the ESG risk score mean that DZ BANK will have access to information on physical risks in the future, which it will factor into the valuation of immovable collateral. Where appropriate, climate-related and environmental risks are therefore taken into account in the valuation of collateral. At group level, the group credit standard for collateral in the DZ BANK Group requires the written policies and procedures on the valuation of collateral to include appropriate rules on the consideration of climate-related and environmental risks.

[12] Environmental risks also include risks relating to waste and water.

The mortgageable value is based on long-term and sustainability-related characteristics of a property and must be determined in accordance with the level of risk and sustainability aspects. All circumstances that affect this value – including from a future perspective – must be taken into account. Identifiable (future) sustainability risks that may arise due to the property's characteristics or location must also be factored into the valuation (e.g. risks resulting from flooding or rising sea levels and above-average falls in value or investment costs stemming from poor energy efficiency). Climate-related and environmental risks are also taken into account in the valuation by examining the standard and quality of the building and its fixtures (e.g. the type and age of the heating system, building insulation). The group entities that specialize in real estate finance, BSH and DZ HYP, have put suitable processes in place.

Operational risk

ESG risk factors may potentially affect operational risk if they give rise to financial losses, for example as a result of sustainability-related legal claims or, in the event of natural and climate disasters, as a result of disruptions to business operations due to extreme weather events such as drought, flooding, or storms.

The main tools used to manage and control operational risk in the DZ BANK Group's Bank sector are a loss database (internal loss data, ILD), scenario-based risk self-assessments (RSAs), and risk indicators (RIs). Operational risks driven by ESG risk are implicitly included in the framework and are managed and monitored in this way.

To explicitly manage operational risks driven by ESG factors, the plan for the future is to use an ESG-specific label in conjunction with the aforementioned management tools. Using the ESG label will enable reliable statements to be made on the basis of expert assessments that indicate the impact of ESG risk factors on operational risk.

Reputational risk

ESG factors may potentially influence reputational risks where products or business relationships harm the DZ BANK Group's reputation because they have an adverse impact on the climate or environment and are therefore regarded as controversial by its stakeholders. Such reputational risk may also arise as a result of deliberate, non-sustainable action or if the stakeholders believe that the DZ BANK Group is overly passive and fails to act sustainably. Generally, sustainability aspects give rise to financial losses if stakeholders take such a negative view of the approach to sustainability that their response has an adverse impact on the DZ BANK Group's financial position and financial performance through multiple channels of impact (e.g. decrease in new and existing business).

Reputational risk control in the DZ BANK Group follows a stakeholder approach that is based on the principle that the perception of the institution by those stakeholders defined as material is the critical metric for reputational risk. The responses of these stakeholders are evaluated in the context of ongoing reporting using a mood barometer, particularly if a reputation-damaging incident occurs. This is underpinned by indicators for each stakeholder that implicitly and explicitly contain sustainability aspects. To explicitly manage and monitor reputational risks driven by ESG factors, the plan for the future is to use an ESG-specific label for the stakeholder-specific indicators.

Market risk

Various processes have been established for the Bank sector in order to take account of climate-related and environmental risks in the context of market risk. The first step is to provide supplementary ESG-related information for the portfolios exposed to market risk. Examples of such information include ESG key figures used in connection with credit risk, which are primarily based on a quantitative evaluation of individual issuers with regard to climate-related and environmental risks. Based on these details, the materiality of climate-related and environmental risks for market risk is assessed as part of the regular annual inventory check process. Over the course of 2023, selected market risk reports will be expanded to include ESG analyses in order to provide ongoing transparency regarding the exposure of the portfolios to climate-related and environmental risks.

Climate-related and environmental risks are implicitly integrated into the ongoing measurement of risk through a broad range of financial risk factors. In particular, the high granularity of issuer-specific credit spread curves ensures that ESG risks materializing in a counterparty's credit spread are also reflected in key risk indicators.

Liquidity risk

As part of the monitoring and management of liquidity risk (ILAAP), a separate risk identification process takes place to provide a capital and income perspective (ICAAP). This process, which takes the form of an annual risk inventory check, determines which risks have a material impact on the DZ BANK Group's liquidity resources. To supplement this, ESG risk drivers are identified that could fundamentally result in increased liquidity risk.

Any impact on liquidity resulting from sustainability matters is heavily dependent on the period in which the individual ESG risk driver has an effect. Consequently, an analysis is conducted to ascertain whether the full impact on liquidity caused by climate-related and environmental, social, and corporate governance risks materializes as a shock within a twelve-month period or as a gradual process over a period of several years.

Furthermore, the degree to which climate-related and environmental risks have an impact is determined using quantitative analysis. This analysis shows that climate-related and environmental risks do affect liquidity risk. Nonetheless, the magnitude of the effects for liquidity risk with a one-year forecast period is not material.

14.2.3.2 Social risks

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 2 rows h to m)

Please refer to the processes described in section 14.2.3.1 for details of the identification of potentially relevant risk factors in the social risks category and the overall definition and management of sustainability risks in the DZ BANK Group.

Social risks arise as a result of inadequate standards for upholding basic rights and protecting against discrimination, or unfair, opaque, or improper customer practices. Such risks mainly result from reputational damage that may lead to changes in customer behavior or demand in the long term and thus has a financial effect on the borrower or counterparty. Financial risks may also arise as a result of ineffective or even disruptive business processes, the loss of key employees and, ultimately, financial claims and liabilities caused by inappropriate practices. DZ BANK takes these financial risks into account in its analysis of credit risk.

At individual loan level, social risk in DZ BANK's lending business is already assessed as part of the lending processes. Fundamentally, all loans must be checked against the rejection criteria described in detail in section 14.2.2.3; in the case of loan applications from sectors defined as sensitive, they must be checked against the sectoral rules. Moreover, DZ BANK stopped providing project finance for new coal-fired power plants in 2018, partly in view of the negative social impact on local residents. In particular, it is prohibited to maintain business relationships with customers if breaches of human rights or significant breaches of environmental standards in their business practices cannot be ruled out. Individual DZ BANK Group entities may apply additional rejection criteria that apply not just to lending but also to investment.

Since 2021, an ad hoc rejection criteria committee has been available to provide support where risks are identified or where there is a lack of clarity regarding the interpretation of rejection criteria and sectoral rules. In addition, loan applications are systematically assessed for relevant sustainability aspects and risks using a sustainability checklist and a qualitative assessment in the loan application process. Project finance with a total investment volume of more than US$ 10 million and project-specific corporate finance with an investment volume of more than US$ 50 million are also subject to an assessment in accordance with the Equator Principles, which complements the sustainability checklist. Depending on their level of environmental and social sustainability, these funding projects are therefore assigned to one of the following categories: A (potentially significant adverse environmental and social impact), B (potentially limited adverse social and environmental impact), or C (low or no adverse environmental and social impact). This should ensure that environmental and social risks are managed in line with country-specific statutory requirements and that the standards of the World Bank (IFC Performance Standards) are adhered to as a minimum.

The ESG checklist described in section 14.2.3.1 will address relevant aspects of the ‘social risks’ risk factor going forward. In the ‘social’ dimension, the questions cover topics such as compliance with human rights, risks for local communities and minority groups, compliance with labor rights (e.g. German General Equal Treatment Act (AGG)), ban on child labor, discrimination, regard for the right of individuals to privacy, freedom of association, life and security, and social aspects in customers’ supply chains. The answers selected generate an interim score for the ‘social’ dimension. As part of the loan application process, the possibility of the counterparty’s credit rating deteriorating in the medium term as a result of social risks must also be assessed and documented.

Details of social risks as part of the ESG dimension in the liquidity risk inventory check can be found in the information on liquidity risk in section 14.2.3.1.

14.2.3.3 Corporate governance risks

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex II table 3 rows a to d)

Corporate governance risks can arise for a borrower or an asset (project / real estate) if there are indications that the company in question is not being run in an orderly fashion. The relevant factors include suspected corruption, tax evasion proceedings, and ongoing antitrust proceedings. Similarly to social risk, the risk here lies in the effects of possible judicial proceedings and in a potential drop in revenue as a result of declining demand.

At DZ BANK, loan applications are currently assessed for corporate governance risks using the sustainability checklist. This is part of the credit check process. Checks for critical corporate governance aspects, such as in the anti-corruption and competition/tax categories, are conducted and evaluated in a standardized manner.

The ESG checklist described in section 14.2.3.1 also addresses relevant aspects of the 'corporate governance risks' risk factor. It contains five questions that are used to evaluate customers regarding human rights due diligence, anti-corruption, tax avoidance/evasion, competition law, and sustainable corporate development. The answers selected generate an interim score for the 'corporate governance' dimension.

The occurrence of corporate governance risks leads, in particular, to increased reputational risk due to a severe loss of confidence among customers and investors. This can result in lost income, higher funding costs, or penalties and can permanently impair the ability to carry out transactions.

By signing up to the UN Global Compact, the DZ BANK Group has undertaken to respect and comply with the ten principles of corporate responsibility. This includes taking decisive action against corruption in all its forms, including extortion, bribery, and passive corruption. For all entities in the DZ BANK Group, complying with environmental laws and legislation is a matter of course. At the same time, the risk of compliance breaches in this area is low for financial institutions.

To prohibit transactions that do not satisfy the minimum corporate governance requirements defined by the DZ BANK Group, exposures are checked against sector-specific rejection criteria during the lending process. Further information on the rejection criteria can be found in sections 14.2.2.2 and 14.2.2.3.

14.3 Quantitative information on ESG risks

14.3.1 Template 1: Banking book – indicators of potential climate change transition risk: credit quality of exposures by sector, emissions, and residual maturity

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 1)

Template 1 is used to disclose the exposures that are prone to climate-related transition risk as a result of the transition to a climate-neutral economy. The focus is on exposures to non-financial entities operating in carbon-intensive sectors. The details to be disclosed include not only the quality and maturity structure of these exposures and non-performing loans but also, where available, information on the financed emissions of the counterparties.

FIG. 82 – TEMPLATE 1: BANKING BOOK – INDICATORS OF POTENTIAL CLIMATE CHANGE TRANSITION RISK: CREDIT QUALITY OF EXPOSURES BY SECTOR, EMISSIONS, AND RESIDUAL MATURITY
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 1)

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	Sector/sub-sector	Gross carrying amount (€ million)					Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions (€ million)			GHG financed emissions (scope 1, scope 2, and scope 3 emissions of the counterparty) (tonnes of CO_2 equivalents)		GHG emissions as a percentage (column i)*	<= 5 years	> 5 years <= 10 years	> 10 years <= 20 years	> 20 years	Average maturity (years)
			of which exposures to entities **	of which environmentally sustainable (CCM)	of which stage 2 exposures	of which non-performing exposures		of which stage 2 exposures	of which non-performing exposures		of which scope 3 financed emissions						
1	**Exposures to sectors that contribute significantly to climate change***	77,096	8,012	-	23,851	3,407	1,020	258	658				41,383	18,886	8,957	7,870	7.34
2	A – Agriculture, forestry, and fishing	704	-	-	93	306	13	3	7				381	262	34	27	5.58
3	B – Mining and quarrying	675	578	-	178	19	15	4	11				405	207	62	2	4.11
4	B.05 – Mining of coal and lignite	11	11	-	-	11	11	-	11				11	-	-	-	0.50
5	B.06 – Extraction of crude petroleum and natural gas	535	535	-	134	-	3	3	-				283	195	57	-	4.35
6	B.07 – Mining of metal ores	-	-	-	-	-	-	-	-				-	-	-	-	4.52
7	B.08 – Other mining and quarrying	97	-	-	23	8	1	1	-				85	6	4	2	3.31
8	B.09 – Mining support service activities	32	32	-	21	-	-	-	-				26	6	-	-	3.65
9	C – Manufacturing	12,861	474	-	1,880	1,171	401	44	331				9,540	2,641	571	108	3.57
10	C.10 – Manufacture of food products	2,161	-	-	145	113	37	8	21				1,668	383	68	42	3.60
11	C.11 – Manufacture of beverages	221	-	-	13	25	9	-	8				138	77	5	1	3.52
12	C.12 – Manufacture of tobacco products	29	-	-	-	0	0	-	0				29	0	-	-	1.08

	Sector/sub-sector	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
		Gross carrying amount (€ million)					Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions (€ million)			GHG financed emissions (scope 1, scope 2, and scope 3 emissions of the counterparty) (tonnes of CO_2 equivalents)		GHG emissions as a percentage (column i)*	<= 5 years	> 5 years <= 10 years	> 10 years <= 20 years	> 20 years	Average maturity (years)
			of which exposures to entities **	of which environmentally sustainable (CCM)	of which stage 2 exposures	of which non-performing exposures		of which stage 2 exposures	of which non-performing exposures		of which scope 3 financed emissions						
13	C.13 – Manufacture of textiles	316	-	-	32	52	14	1	13				171	143	1	1	4.21
14	C.14 – Manufacture of wearing apparel	71	-	-	3	8	4	0	4				66	3	0	2	2.70
15	C.15 – Manufacture of leather and related products	36	-	-	0	18	2	0	1				34	1	0	1	1.87
16	C.16 – Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	279	-	-	11	31	1	0	0				145	128	2	4	4.57
17	C.17 – Manufacture of pulp, paper, and paperboard	536	-	-	137	36	18	12	5				266	245	25	-	5.22
18	C.18 – Printing and service activities related to printing	84	-	-	6	29	2	0	1				62	14	6	2	4.80
19	C.19 – Manufacture of coke oven products	384	384	-	8	0	0	0	0				108	80	196	-	8.43
20	C.20 – Production of chemicals	1,454	90	-	158	15	9	2	6				960	309	184	1	4.37
21	C.21 – Manufacture of pharmaceutical preparations	495	-	-	11	1	2	1	0				366	129	-	0	3.35

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	Sector/sub-sector	Gross carrying amount (€ million)					Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions (€ million)			GHG financed emissions (scope 1, scope 2, and scope 3 emissions of the counterparty) (tonnes of CO_2 equivalents)		GHG emissions as a percentage (column i)*	<= 5 years	> 5 years <= 10 years	> 10 years <= 20 years	> 20 years	Average maturity (years)
			of which exposures to entities **	of which environmentally sustainable (CCM)	of which stage 2 exposures	of which non-performing exposures		of which stage 2 exposures	of which non-performing exposures		of which scope 3 financed emissions						
22	C.22 – Manufacture of rubber products	790	-	-	136	48	21	1	18				563	210	16	2	3.41
23	C.23 – Manufacture of other non-metallic mineral products	539	-	-	12	37	8	1	6	486,344		14.77	445	81	10	3	3.13
24	C.24 – Manufacture of basic metals	399	-	-	61	46	11	1	10	485,030		11.57	261	116	20	3	4.01
25	C.25 – Manufacture of fabricated metal products, except machinery and equipment	904	-	-	131	270	55	3	50				767	123	7	7	2.81
26	C.26 – Manufacture of computer, electronic, and optical products	696	-	-	97	40	26	1	24				586	91	2	16	3.28
27	C.27 – Manufacture of electrical equipment	291	-	-	34	10	4	1	2				239	51	0	1	2.90
28	C.28 – Manufacture of machinery and equipment	1,615	-	-	122	112	51	4	44				1,455	143	13	5	2.08
29	C.29 – Manufacture of motor vehicles, trailers, and semi-trailers	819	-	-	544	213	112	7	106	30,295		24.72	640	178	1	1	3.11
30	C.30 – Manufacture of other transport equipment	264	-	-	191	10	6	1	5				262	2	0	0	1.13
31	C.31 – Manufacture of furniture	138	-	-	16	13	4	1	3				95	36	2	5	4.64
32	C.32 – Other manufacturing	304	-	-	5	22	1	0	0				194	93	11	6	3.98

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	Sector/sub-sector	Gross carrying amount (€ million)					Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions (€ million)			GHG financed emissions (scope 1, scope 2, and scope 3 emissions of the counterparty) (tonnes of CO_2 equivalents)		GHG emissions as a percentage (column i)*	<= 5 years	> 5 years <= 10 years	> 10 years <= 20 years	> 20 years	Average maturity (years)
			of which exposures to entities **	of which environmentally sustainable (CCM)	of which stage 2 exposures	of which non-performing exposures		of which stage 2 exposures	of which non-performing exposures		of which scope 3 financed emissions						
33	C.33 – Repair and installation of machinery and equipment	36	-	-	5	22	4	0	3				21	7	3	5	7.56
34	D – Electricity, gas, steam, and air conditioning supply	8,894	5,958	-	508	78	83	47	20				2,893	3,307	2,539	155	8.06
35	D35.1 – Electric power generation, transmission, and distribution	6,392	5,523	-	248	57	57	31	13				1,856	2,303	2,108	125	8.63
36	D35.11 – Production of electricity	5,523	5,523	-	246	55	56	31	13	1,268,852			1,594	2,009	1,852	67	8.62
37	D35.2 – Manufacture of gas; distribution of gaseous fuels through mains	435	435	-	165	10	11	10	0				135	160	140	-	8.22
38	D35.3 – Steam and air conditioning supply	47	-	-	0	1	0	0	0				10	21	16	0	8.18
39	E – Water supply; sewerage, waste management, and remediation activities	878	-	-	9	56	4	0	3				414	181	74	210	9.46
40	F – Construction	2,996	-	-	468	437	58	6	44				1,647	436	500	414	7.96
41	F.41 – Construction of buildings	1,386	-	-	331	59	28	2	25				942	92	300	51	5.48
42	F.42 – Civil engineering	443	-	-	6	48	6	0	6				218	101	62	62	8.55
43	F.43 – Specialized construction activities	1,167	-	-	131	330	24	4	14				486	242	138	301	10.68

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	Sector/sub-sector	Gross carrying amount (€ million)					Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions (€ million)			GHG financed emissions (scope 1, scope 2, and scope 3 emissions of the counterparty) (tonnes of CO_2 equivalents)		GHG emissions as a percentage (column i)*	<= 5 years	> 5 years <= 10 years	> 10 years <= 20 years	> 20 years	Average maturity (years)
			of which exposures to entities **	of which environmentally sustainable (CCM)	of which stage 2 exposures	of which non-performing exposures		of which stage 2 exposures	of which non-performing exposures		of which scope 3 financed emissions						
44	G – Wholesale and retail trade; repair of motor vehicles and motorcycles	7,040	957	-	353	695	157	10	129				5,939	742	148	211	3.22
45	H – Transportation and storage	3,836	44	-	407	363	102	23	66				2,470	717	543	105	5.34
46	H.49 – Land transport and transport via pipelines	961	-	-	31	167	6	1	2				525	220	150	66	6.88
47	H.50 – Water transport	1,282	-	-	340	122	82	21	60				904	273	101	4	3.98
48	H.51 – Air transport	145	-	-	14	1	1	0	0	71,631		52.60	77	67	0	1	4.32
49	H.52 – Warehousing and support activities for transportation	1,291	44	-	22	66	12	1	4				919	118	222	32	5.28
50	H.53 – Postal and courier activities	158	-	-	1	7	1	0	0				45	40	70	2	8.27
51	I – Accommodation and food service activities	474	-	-	115	147	23	7	13				255	148	26	45	7.54
52	L – Real estate activities	38,737	-	-	19,841	135	165	115	35				17,440	10,245	4,459	6,594	9.37
53	**Exposures to sectors other than those that contribute significantly to climate change***	10,573	-	-	2,306	786	102	26	53				6,776	1,888	937	972	6.64
54	K – Financial and insurance activities	1,072	-	-	766	3	6	3	3				656	244	98	75	6.23
55	Exposures to other sectors (NACE codes J, M to U)	9,501	-	-	1,540	783	96	23	50				6,120	1,644	839	897	-

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	Sector/sub-sector	Gross carrying amount (€ million)					Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions (€ million)			GHG financed emissions (scope 1, scope 2, and scope 3 emissions of the counterparty) (tonnes of CO_2 equivalents)		GHG emissions as a percentage (column i)*	<= 5 years	> 5 years <= 10 years	> 10 years <= 20 years	> 20 years	Average maturity (years)
			of which exposures to entities **	of which environmentally sustainable (CCM)	of which stage 2 exposures	of which non-performing exposures		of which stage 2 exposures	of which non-performing exposures		of which scope 3 financed emissions						
56	**Total as at Dec. 31, 2022**	87,669	8,012	-	26,157	4,193	1,122	284	710				48,159	20,774	9,894	8,842	7.26

* GHG emissions (column i): Percentage, based on gross carrying amount, of the portfolio derived from entity-specific reporting.
** Of which exposures to entities excluded from EU Paris-aligned benchmarks in accordance with article 12 (1) letters d to g and article 12 (2) of Regulation (EU) 2020/1818.

Also to be disclosed are exposures to counterparties that are excluded from the Paris-aligned benchmarks (PABs) in accordance with article 12 (1) letters d to g and article 12 (2) of Commission Delegated Regulation (EU) 2020/1818. For its disclosures as at December 31, 2022, the DZ BANK banking group used an internal process for identifying counterparties that are classified as excluded in accordance with the PABs. Based on the sector definitions, individual NACE codes that indicate a blanket exclusion were selected for this internal classification in the first step. In view of the statements in article 12 (1) letters d to g of Commission Delegated Regulation (EU) 2020/1818, the DZ BANK banking group drew up a list of the NACE codes to be excluded.

Furthermore, all counterparties that, pursuant to template 4, are among the world's top 20 carbon-intensive firms are also considered to be excluded entities in accordance with the PABs.

Disclosures relating to financed emissions of counterparties are limited to certain focus sectors that, pursuant to recital 6 of Commission Delegated Regulation (EU) 2020/1818, contribute significantly to climate change and that, as a first step, DZ BANK has identified as relevant. The financed scope 1 and scope 2 emissions are disclosed for sectors that are also a focus of climate alignment and whose base data has been validated in detail. The DZ BANK banking group is updating its methodology for calculating scope 3 emissions and for other sectors on an ongoing basis and will publish the results by 2024 at the latest.

DZ BANK has established a groupwide collaboration model for calculating financed emissions. The model incorporates existing centers of excellence covering areas such as real estate finance. DZ BANK calculates the financed emissions in the corporates and project finance asset classes centrally for the banking group, with specialist quality assurance conducted by the group entities. The calculation is based on the total sample and the carrying amounts for the aggregated credit risk data, supplemented with sector-specific and country-specific average values for exposures not included in this aggregated data. Commercial real estate emissions data is calculated and provided by DZ HYP due to this group entity's real estate expertise.

The calculation of greenhouse gas emissions (the customer's total emissions (scopes 1–3) for all greenhouse gases specified in the Kyoto Protocol[13] in CO_2 equivalents (CO_2e)) is based on the standards of the Partnership for Carbon Accounting Financials (PCAF). Under the model, the way in which greenhouse gas emissions are determined depends on the availability of data. Preferably, directly collected emissions data or externally published emissions data[14] is used in the calculations. However, if published information is not available, the customer-specific emissions are determined using bottom-up or regression models[15] or using granular sector-specific and country-specific average values.[16]

The financed portion of the scope 1 and scope 2 emissions of the counterparty are calculated in proportion to the enterprise value[17] based on drawdowns. The basis for calculating the financed emissions consists of all on-balance-sheet transactions of a finance nature, in particular all loans with payments drawn down.

DZ HYP calculates financed emissions for commercial real estate. The financed emissions are calculated as a proportion of the emissions of the real estate based on the outstanding lending volume relative to the market value of the real estate. Scope 1 emissions are those emissions resulting from heating; scope 2 emissions result from electricity consumption.

Emissions data is taken directly from the EPC information[18], where available, or derived from the relevant disclosures on final energy consumption/requirements and/or primary energy consumption/requirements. Where only a building's final energy consumption data is available for electricity and heating, the figures are converted into emissions by multiplying them by emissions factors (depending on the heating technology used and the country-specific electricity mix). If no EPC information is available for a building, proxy values are used instead that depend on the asset type. The comparative figures are taken from the CRREM[19] starting values

[13] The following greenhouse gases are relevant under the Kyoto Protocol: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
[14] Based on S&P CapitalIQ Pro, Copyright © 2023, S&P Global Market Intelligence.
[15] Based on reported emissions from Refinitiv (part of the London Stock Exchange Group) and revenue figures from Orbis (Bureau van Dijk / Moody's Analytics).
[16] Based on macroeconomic data from Oxford Economics and emissions data from Exiobase.
[17] Enterprise value including cash (EVIC); total assets for unlisted entities.
[18] EPC = energy performance certificate (a document certifying a building's energy efficiency).
[19] The Carbon Risk Real Estate Monitor (CRREM) project provides data and strategies for the decarbonization of the real estate sector.

(Carbon Risk Real Estate Monitor) as these are based on empirical data. In addition, the CRREM proxy value is multiplied by a construction-year-specific factor that is derived from the construction year distribution for a sample of EPCs for 2014 to 2019 from the Deutsches Institut für Bautechnik (DIBt) [German Institute for Building Technology].

14.3.2 Template 2: Banking book – indicators of potential climate change transition risk: loans collateralized by immovable property – energy efficiency of the collateral

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 2)

Template 2 is used to disclose information on the transition risk of loans collateralized by commercial or residential real estate and on any pledged or repossessed collateral. The portfolios are mainly held by the real estate finance providers DZ HYP and BSH, by DZ BANK and, on a small scale, by DZ PRIVATBANK. The real estate loans and repossessed collateral are broken down by their (estimated) level of energy efficiency – measured in kWh/m2 of energy consumption – and by their EPC category. Exposures that do not have an EPC category must also be disclosed, along with their percentage and the estimated level of energy efficiency.

FIG. 83 – TEMPLATE 2: BANKING BOOK – INDICATORS OF POTENTIAL CLIMATE CHANGE TRANSITION RISK: LOANS COLLATERALIZED BY IMMOVABLE PROPERTY – ENERGY EFFICIENCY OF THE COLLATERAL
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 2)

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
		Gross carrying amount (€ million)															
			Level of energy efficiency (energy performance score (EPS) of the collateral (kWh/m²))						Level of energy efficiency (EPC category of the collateral)							Collateral without an EPC category	
	Counterparty sector		0; <= 100	> 100; <= 200	> 200; <= 300	> 300; <= 400	> 400; <= 500	> 500	A	B	C	D	E	F	G		of which level of energy efficiency (EPS of collateral (kWh/m²)) estimated (%)
1	**Total EU area**	113,513	39,090	50,047	18,061	365	64	59	1,946	2,650	2,934	2,595	1,375	806	608	100,599	94.21
2	of which loans collateralized by commercial immovable property	32,041	13,263	10,803	3,714	345	58	59	1,168	1,817	1,982	2,081	1,016	571	483	22,923	83.43
3	of which loans collateralized by residential immovable property	81,419	25,827	39,244	14,346	20	6	-	777	833	952	514	359	236	126	77,622	97.46
4	of which collateral obtained by taking possession: residential and commercial immovable properties	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	of which level of energy efficiency (EPS of collateral (kWh/m²)) estimated	96,347	33,426	44,493	16,852	-	-	-								96,347	98.36
6	**Total non-EU area**	1,082	98	143	84	-	-	-	-	-	11	23	4	6	5	1,032	26.74
7	of which loans collateralized by commercial immovable property	284	68	81	83	-	-	-	-	-	11	20	3	5	5	239	78.10
8	of which loans collateralized by residential immovable property	798	30	62	1	-	-	-	-	-	-	3	1	1	-	794	11.30
9	of which collateral obtained by taking possession: residential and commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	of which level of energy efficiency (EPS of collateral (kWh/m²)) estimated	276	95	102	79	-	-	-								276	100.00

DZ HYP has energy consumption data available in its systems for approximately a fifth of the loans collateralized by real estate. If a building's energy consumption is not known, various proxy values are used instead that depend on the asset type. Each asset in the portfolio is assigned to one of the following asset types: hotel, wholesale/retail, office, logistics, single-unit or two-unit residential, multi-unit residential. The asset type numbers are used to assign the assets to one of the six building types in the internally aggregated data.

This assignment to simplified asset type descriptions facilitates the allocation of final energy consumption, which provides the final energy proxy based on an additional scaling factor that depends on the year of construction.

The final energy comparative figures are derived from building-type-specific energy reduction strategies supplied by the EU-funded CRREM project.

A top-down distribution among EPC categories is available for BSH's entire portfolio of loans collateralized by real estate. All existing properties are allocated to homogeneous energy consumption categories. The basis for this allocation is the building typology of the Institut Wohnen und Umwelt (IWU) [Institute for Housing and Environment]. The main characteristics used for the allocation are year of construction, year of modernization, building type, intended use, and scale of rates and charges (e.g. 'Fuchs Energie', which is used only for energy efficiency measures). These categories are used to determine the energy consumption and requirement and then to assign the property to an EPC category. The assignment of energy consumption to a category is based on the provisions of the German Buildings Energy Act (GEG). GEG conversion factors are used to convert the figure for residential floor space used by BSH to the figure for energy reference area used in the GEG.

DZ BANK and DZ PRIVATBANK do not have any EPC data in their systems.

14.3.3 Template 3: Banking book – indicators of potential climate change transition risk: alignment metrics

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 3)

Institutions use template 3 to provide information on their efforts to align with the objectives of the Paris Agreement for selected sectors. For example, the disclosures in template 3 show the extent to which financing contributes to lower greenhouse gas emissions and climate-resilient development. Institutions must take the Net Zero Emissions by 2050 (NZE2050) scenario into account. This normative scenario from the International Energy Agency (IEA) shows how the global economy can achieve net-zero emissions by 2050.

FIG. 84 – TEMPLATE 3: BANKING BOOK – INDICATORS OF POTENTIAL CLIMATE CHANGE TRANSITION RISK: ALIGNMENT METRICS
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 3)

	a	b	c	d	e	f	g
	Sector	NACE sectors (minimum selection)*	Portfolio gross carrying amount (€ million)	Alignment metric**	Year of reference	Distance to IEA NZE2050 (%)***	Target (year of reference + 3 years) ****
1	Power		5,507	PACTA (kgCO2e/MWh)	2022	-26	107.00
2	Fossil fuel combustion		-	-	-	-	-
3	Automotive		85	PACTA (kgCO2/km)	2022	43	0.14
4	Aviation		143	PACTA (kgCO2/pkm)	2022	21	0.09
5	Maritime transport		-	-	-	-	-
6	Cement, clinker, and lime production		148	PACTA (kgCO2e/ kgCement)	2022	36	0.60
7	Iron and steel, coke, and metal ore production		110	PACTA (kgCO2e /kgSteel)	2022	-8	1.05
8	Chemicals		-	-	-	-	-
9	... potential additions relevant to the business model of the institution		-	-	-	-	-

* The list of the NACE sectors to be considered can be found in the annex.
** Parameter examples: See annex 2.
*** PiT distance to 2030 NZE2050 scenario (%, for each parameter).
**** Units according to column d.

In 2022, DZ BANK set specific climate goals for five focus sectors that are particularly relevant for decarbonization: automotive, energy, steel, cement, and aviation. The goals are laid out in the 2022 Sustainability Report and also published with identical wording in template 3.

The underlying methodology is based on the rules in the Paris Agreement Capital Transition Assessment (PACTA). The main principle of the PACTA methodology is the measurement of sector-specific physical emissions intensities, which are then compared with the IEA Net Zero 2050 scenarios. Physical emissions intensity reflects the particular nature of the individual sector and facilitates comparisons between companies in that sector. The specific comparison scenarios in this context are drawn from the updated roadmap for net-zero emissions by 2050 of the World Energy Outlook 2022. To ensure that all the scope 1 and 2 emissions in the steel and cement sectors are included, data on electricity consumption from IEA ETP 2020[20] is also used.

DZ BANK's sectoral goals for its lending and investment portfolio are aligned with the Paris climate agreement. Climate alignment focuses on the parts of the value chain that exert the greatest leverage effect in terms of decarbonization. To comply with the PACTA methodology, template 3 also looks at the particular NACE codes that cover all of the counterparties included in DZ BANK's portfolio that are relevant to climate alignment[21]. In line with internal management and the goals defined in the published Sustainability Report, the portfolio's physical emissions intensity is calculated on the basis of the total sample and the carrying amounts for the aggregated credit risk data.

As well as the focus sectors mentioned above, PACTA also describes methods for the oil and gas sector and for shipping. These sectors are currently being analyzed in detail, and information will be published at a later date.

[20] Energy Technology Perspective (ETP) of the International Energy Agency (IEA).
[21] Power: D.35.1.1 with activity splits for companies in the energy sector in general; automotive: C.29.1 and C.29.1.0; aviation: H.51, H.51.(1–2) and H.51.2.(1–2); cement, clinker, and lime production: C.35 and C.35.(1–2); iron and steel, coke, and metal ore production: C.24.1 and C.24.5.(1-2).

Funding for coal has already been reduced to an immaterial level by applying a rejection criterion.[22] The aim is to analyze the chemicals sector as soon as methodology rules are available from PACTA. Unlike at DZ BANK level, real estate finance plays an important role in the banking group. Working in cooperation with DZ BANK AG, the relevant entities are currently finalizing climate alignment for real estate.

To ensure that the results for its portfolio are consistent, DZ BANK calculates physical emissions intensity on a bottom-up basis at asset level for each customer in the selected focus sectors. Granular production data and emissions factors that are primarily based on external data sources are used for each sector (see the explanations for the sectors below). Intensity is calculated on the basis of the aggregated credit risk data and exclusively for DZ BANK.

In the energy sector, a high degree of portfolio coverage is achieved by using data from S&P CapitalIQ Pro[23] and detailed technological information. For a few customers that are not covered, emissions data can be approximated using country-specific average values.

The calculation of physical emissions intensity for the automotive sector uses data from IHS Markit[24], which also contains forecasts for global automotive production. This makes it possible to carry out reliable modeling, not only for the status quo but also for the portfolio forecast and for management purposes.

Modeling in the steel sector poses significant challenges because manufacturing processes are spread across complex corporate group structures. To this end, production is modeled in steel equivalents throughout all of the corporate groups and process steps of our customers in order to determine total steel production and the associated emissions. Production data from Plantfacts[25] is used for this purpose.

For the cement sector, energy consumption has to be modeled and the process-specific emissions from calcination have to be calculated. Modeling therefore takes account of both the proportion of clinker and the specific energy mix for operation of the rotary kilns for all global production sites. Production data from Cemnet[26] is used for this purpose.

For the aviation sector, all aircraft in a fleet for which granular flight data is available are tracked in order to determine the emissions that they generate. Aircraft-specific data from Cirium[27] is used for modeling purposes. In addition to the calculation of current physical emissions intensity, the waning effect of the COVID-19 pandemic on emissions intensity was also taken into account when the goals were determined.

Sector	**Method-ology**	**Value chain**	**Metric**	**Emissions included**
1. Energy	PACTA	Generation	$kgCO_2e$/MWh	Scope 1
2. Automotive	PACTA	OEMs	$kgCO_2$/km	Scope 3, exhaust emissions
3. Steel	PACTA	Production	$kgCO_2e$/kgSteel	Scopes 1–2
4. Cement	PACTA	Manufacturing	$kgCO_{2e}$/kgCement	Scopes 1–2
5. Aviation	PACTA	Passenger airlines	$kgCO_2$/pkm	Scope 1, kerosene combustion

[22] See rejection criteria of the DZ BANK Group: DZ BANK does not provide funding to any company that generates more than 5 percent of its revenue or of its power from the extraction of or trade in thermal coal unless the company can demonstrate a clear will to transform or can prove that it will not use the funds for these activities. Nor does DZ BANK provide lending for existing coal-fired power plants or to build new ones.
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[24] Copyright © 2023, S&P Global Market Intelligence.
[25] Plantfacts by BCG, Copyright © 2023 The Boston Consulting Group.
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14.3.4 Template 4: Banking book – indicators of potential climate change transition risk: exposures to top 20 carbon-intensive firms

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 4)

Template 4 is used to disclose the aggregate exposure in DZ BANK's banking book to the 20 biggest emitters of greenhouse gases in the world. To identify the biggest emitters of greenhouse gases, the DZ BANK banking group uses information from the Climate Accountability Institute for the period 1965 to 2017.

FIG. 85 – TEMPLATE 4: BANKING BOOK – INDICATORS OF POTENTIAL CLIMATE CHANGE TRANSITION RISK: EXPOSURES TO TOP 20 CARBON-INTENSIVE FIRMS
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 4)

	a	b	c	d	e
	Gross carrying amount (€ million) (aggregate)	**Gross carrying amount of exposures to the counterparties compared to total gross carrying amount (aggregate)***	**of which environmentally sustainable (CCM)**	**Weighted average maturity (years)**	**Number of top 20 polluting firms included**
1	580	0.66%	-	5.47	10

(*) For counterparties among the world's top 20 carbon intensive firms.

The aggregate gross carrying amount is the sum of all exposures to counterparties in the corporate group of the greenhouse gas emitter, including funding activities. This was calculated as a percentage of the total gross carrying amount of the exposures to all non-financial companies, as set out in template 1.

14.3.5 Template 5: Banking book – indicators of potential climate change physical risk: exposures subject to physical risk

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 5)

Template 5 is used to disclose information on exposures to non-financial entities in the banking book, loans collateralized by real estate, and repossessed collateral that are exposed to physical risk resulting from climate change and thus to chronic and acute climate-related risks. The exposures are broken down by NACE sector and by the geographical location of the collateral or activity of the counterparty.

Template 5 is shown separately for exposures in Germany (5a) and exposures outside Germany (5b).

FIG. 86 – TEMPLATE 5A: BANKING BOOK – INDICATORS OF POTENTIAL CLIMATE CHANGE PHYSICAL RISK: EXPOSURES SUBJECT TO PHYSICAL RISK – GERMANY
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 5)

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
		Gross carrying amount (€ million)													
			of which exposures sensitive to impact from climate change physical events												
	Variable: Geographical area subject to climate change physical risk – acute and chronic events		**Breakdown by maturity band**					**of which exposures sensitive to impact from chronic climate change events**	**of which exposures sensitive to impact from acute climate change events**	**of which exposures sensitive to impact from both chronic and acute climate change events**	**of which stage 2 exposures**	**of which non-performing exposures**	**Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions**		
			<= 5 years	**> 5 years <= 10 years**	**> 10 years <= 20 years**	**> 20 years**	**Average maturity (years)**							**of which stage 2 exposures**	**of which non-performing exposures**
1	A – Agriculture, forestry, and fishing	700	47	24	4	7	6.38	41	52	12	11	52	1	0	0
2	B – Mining and quarrying	78	3	3	-	-	5.22	2	4	0	3	1	0	0	0
3	C – Manufacturing	8,600	1,309	214	22	13	2.65	530	1,067	39	372	181	72	16	52
4	D – Electricity, gas, steam, and air conditioning supply	5,523	423	464	270	1	8.07	463	877	181	20	4	4	2	0
5	E – Water supply; sewerage, waste management, and remediation activities	737	246	42	18	21	4.07	231	105	8	1	23	3	0	3
6	F – Construction	2,049	277	37	14	43	5.59	163	241	33	120	98	24	1	21
7	G – Wholesale and retail trade; repair of motor vehicles and motorcycles	5,235	1,095	85	18	34	2.90	642	639	50	37	100	14	1	8
8	H – Transportation and storage	2,417	413	126	31	4	3.89	210	432	67	121	108	51	15	34
9	L – Real estate activities	32,432	2,499	1,886	626	1,000	9.30	2,095	4,066	150	3,279	13	24	22	0
10	Loans collateralized by residential immovable property	79,757	3,917	3,101	3,347	3,584	13.70	6,874	6,641	807	975	73	44	22	12
11	Loans collateralized by commercial immovable property	25,939	2,914	1,972	173	107	4.92	1,692	3,751	277	3,983	42	45	24	19
12	Repossessed collateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Other relevant sectors (breakdown below where relevant)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

FIG. 87 – TEMPLATE 5B: BANKING BOOK – INDICATORS OF POTENTIAL CLIMATE CHANGE PHYSICAL RISK: EXPOSURES SUBJECT TO PHYSICAL RISK – OUTSIDE GERMANY
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 5)

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
		Gross carrying amount (€ million)													
			of which exposures sensitive to impact from climate change physical events												
			Breakdown by maturity band					**of which exposures sensitive to impact from chronic climate change events**	**of which exposures sensitive to impact from acute climate change events**	**of which exposures sensitive to impact from both chronic and acute climate change events**	**of which stage 2 exposures**	**of which non-performing exposures**	**Accumulated impairment, accumulated negative changes in fair value due to credit risk, and provisions**		
	Variable: Geographical area subject to climate change physical risk – acute and chronic events		**<= 5 years**	**> 5 years <= 10 years**	**> 10 years <= 20 years**	**> 20 years**	**Average maturity**							**of which stage 2 exposures**	**of which non-performing exposures**
1	A – Agriculture, forestry, and fishing	5	4	-	-	-	0.25	4	1	1	0	-	0	0	-
2	B – Mining and quarrying	597	133	95	57	-	5.02		64	24	23	-	0	0	-
3	C – Manufacturing	4,260	812	426	296	14	5.44	1,342	325	120	140	140	33	1	31
4	D – Electricity, gas, steam, and air conditioning supply	3,372	350	540	440	57	8.52	1,294	319	226	49	9	11	3	7
5	E – Water supply; sewerage, waste management, and remediation activities	141	34	5	-	35	12.90	54	19	-	-	-	0	-	-
6	F – Construction	947	76	41	100	100	12.97		170	44	30	0	1	1	0
7	G – Wholesale and retail trade; repair of motor vehicles and motorcycles	1,805	886	32	24	41	3.51	820	173	11	0	30	11	0	10
8	H – Transportation and storage	1,419	406	97	87	48	6.07	533	141	36	36	15	16	1	14
9	L – Real estate activities	6,305	1,490	366	106	4	4.25		1,373	271	1,670	-	14	13	-
10	Loans collateralized by residential immovable property	2,459	47	9	6	9	7.93	20	44	8	5	1	0	0	0
11	Loans collateralized by commercial immovable property	6,386	1,744	368	60	0	3.83	956	1,539	322	1,912	12	18	15	3
12	Repossessed collateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Other relevant sectors (breakdown below where relevant)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Three types of sensitivity are shown for each location: sensitivity to exclusively acute physical risk, sensitivity to exclusively chronic physical risk, and sensitivity to both acute and chronic physical risk.

For the determination of sensitivity, a distinction is made between corporate loans and loans collateralized by real estate. Disclosure of sensitivity to physical risk should take account of the regions, i.e. the geo-locations of the counterparty and the legal location of the real estate (*lex loci rei sitae*). As physical risk can be understood as an environmental hazard arising in a specific local area, it is preferable and necessary to determine a counterparty's precise location. In the case of loans collateralized by real estate, the actual addresses of the collateral are used to determine acute and chronic risks. By contrast, the registered offices and their addresses are used to determine the sensitivity of relevant company loans.

In the next step, the addresses for loans are assigned to coordinates (longitude and latitude). For this assignment, known as geo-coding, DZ BANK has developed a proprietary solution for the purposes of ESG credit scoring. Using data from the open-source mapping project, geo-coordinates for any given address can be found with a level of accuracy ranging from house number to postal code. This enables the precise location to be determined so that physical risks can be identified accurately.

Three acute and three chronic risks are used as the basis for ascertaining sensitivity. These result from the following environmental hazards: river flood, coastal flood, and landslide in the case of acute risks; extreme heat, water scarcity, and rising sea levels in the case of chronic risks.

Using information from experts, four scores are calculated for a location's hazard level, e.g. height of river flood or number of days of extreme heat. The scores are based on the results of the World Bank's ThinkHazard! project and indicate a threshold that has to be achieved in order to define a level of risk determined by the expected loss. This results in scoring that shows the following four risk levels for a location and a hazard: very low, low, medium, and high.

For the scoring of a physical risk, which is used to determine sensitivity, both the three acute risks and the three chronic risks are combined to give two aggregate scores on the basis of weighting and subsequent scaling.

A location is deemed to be sensitive as soon as at least one of the three risks is given the second highest score of 3 (medium).

14.3.6 Template 10: Other climate change mitigating actions that are not covered in Regulation (EU) 2020/852

(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 10)

Template 10 contains a summary of further measures to mitigate climate change and includes exposures that support the aim of adapting to and mitigating climate change. These measures and activities encompass bonds and loans that were issued in accordance with standards other than EU standards, for example green loans and bonds, sustainability loans and bonds, and sustainability-linked loans and bonds that are linked to aspects of climate change.

FIG. 88 – TEMPLATE 10: OTHER CLIMATE CHANGE MITIGATING ACTIONS THAT ARE NOT COVERED IN REGULATION (EU) 2020/852
(Article 449a CRR in conjunction with Implementing Regulation (EU) 2022/2453 annex I template 10)

	a	b	c	d	e	f
	Type of financial instrument	**Type of counterparty**	**Gross carrying amount (€ million)**	**Type of risk mitigated (climate change transition risk)**	**Type of risk mitigated (climate change physical risk)**	**Qualitative information on the nature of the mitigating actions**
1	Bonds (e.g. green, sustainability, sustainability-linked under standards other than the EU standards)	Financial corporations	952	Green projects or activities that promote climate change mitigation, climate change adaptation, or other environmental sustainability objectives	-	Green bonds, sustainability bonds, and sustainability-linked bonds as defined by Bloomberg
2		Non-financial corporations	163	Green projects or activities that promote climate change mitigation, climate change adaptation, or other environmental sustainability objectives	-	Green bonds, sustainability bonds, and sustainability-linked bonds as defined by Bloomberg
3		of which loans collater-alized by commercial immovable property	-	-	-	-
4		Other counterparties	21	Green projects or activities that promote climate change mitigation, climate change adaptation, or other environmental sustainability objectives	-	Green bonds, sustainability bonds, and sustainability-linked bonds as defined by Bloomberg
5	Loans (e.g. green, sustainability, sustainability-linked under standards other than the EU standards)	Financial corporations	-	-	-	-
6		Non-financial corporations	5,418	Reduction in carbon emissions	-	Funding of renewable energies (including wind energy, photovoltaics, and biogas)
7		of which loans collater-alized by commercial immovable property	-	-	-	-
8		Households	-	-	-	-
9		of which loans collater-alized by residential immovable property	-	-	-	-
10		of which building renovation loans	-	-	-	-
11		Other counterparties	-	-	-	-

For the first disclosure date of December 31, 2022, the relevant bonds and loans were reported using a manual process. At DZ BANK, the loans were identified from the portfolio of renewable energies funding. The exposures classified in this way are shown in the loans category in template 10 and comprise the on-balance-sheet exposures in the banking book. The bonds at DZ BANK classified as green bonds, sustainability bonds, or sustainability-linked bonds were identified and are shown in the bonds category. Classification was based on the Bloomberg definitions.

15 Remuneration policy

(Article 450 CRR)

15.1 General disclosures

Table EU REMA – Remuneration policy

(Article 450 (1) letters a, b, c, d, e, f, and k and article 450 (2) CRR)

Templates EU REM1 to REM5

(Article 450 (1) letters g to k and (2) CRR)

Pursuant to section 16 of the German Regulation Governing Remuneration at Institutions (InstitutsVergV, new version dated September 25, 2021), DZ BANK is required to disclose information about its remuneration policy and practices. As an (EU) parent institution, DZ BANK must disclose information at consolidated level. Because it is an institution subject to the CRR (Regulation (EU) 575/2013), DZ BANK is subject to the disclosure requirements specified by article 450 CRR in conjunction with Implementing Regulation (EU) 2021/637 dated March 15, 2021 and section 16 InstitutsVergV.

Pursuant to article 450 CRR, DZ BANK must disclose certain qualitative and quantitative information for categories of employees whose activities have a material impact on its risk profile (risk takers).

In 2022, DZ BANK and the following subordinated management units identified the employees whose activities have a material impact on the risk profile:

- Bausparkasse Schwäbisch Hall AG (BSH)
- DZ HYP AG (DZ HYP)
- DVB Bank SE (DVB)
- DZ PRIVATBANK S.A. (DZ PRIVATBANK)
- TeamBank AG Nürnberg (TeamBank)
- VR Smart Finanz AG (VR Smart Finanz)

Risk takers were identified in accordance with sections 1 (21) and 25a (5b) KWG and on the basis of Commission Delegated Regulation (EU) 2021/923 of March 25, 2021 supplementing Directive 2013/36/EU of the European Parliament and of the Council with regard to regulatory technical standards setting out the criteria to define managerial responsibility, control functions, material business units and a significant impact on a material business unit's risk profile, and setting out criteria for identifying staff members or categories of staff whose professional activities have an impact on the institution's risk profile that is comparably as material as that of staff members or categories of staff referred to in article 92 (3) of that Directive.

This disclosure contains detailed information on remuneration in the DZ BANK Group at consolidated level for the 2022 financial year. The information disclosed in this report is subject to the principle of proportionality pursuant to article 450 (2) sentence 2 CRR. The information is disclosed for the DZ BANK Group in a manner that is appropriate to its size, its internal organization, and the nature, scope, and complexity of its activities and without prejudice to Regulation (EU) 2016/679 of the European Parliament and of the Council.

The quantitative information pursuant to article 450 (1) letters g to k and article 450 (2) CRR is published after all bonus payments have been calculated. The information disclosed for 2022 pursuant to article 450 CRR in conjunction with section 16 InstitutsVergV for the institutions in the DZ BANK Group will therefore be updated in a separate report in the second quarter. This report disclosing the remuneration policy can be found on DZ BANK's website in the Investor Relations section under Reports.

15.2 Remuneration governance in the DZ BANK Group

15.2.1 Remuneration strategy of the DZ BANK Group

Section 27 InstitutsVergV requires the senior management of the parent company to define a groupwide remuneration strategy. The Board of Managing Directors of DZ BANK must define a remuneration strategy both for DZ BANK and for the entities in the DZ BANK Group that implements the requirements of InstitutsVergV for the institutions in the DZ BANK Group.

The DZ BANK Group's remuneration strategy sets out uniform rules for the groupwide management of remuneration that apply to the remuneration systems of the entities in the DZ BANK Group. On the basis of this framework, each subordinated entity is obliged to document its subgroup's compliance with the agreed principles and to present this for inspection by DZ BANK.

Decentralized decision-making powers are one of the features of the balanced management approach taken within the DZ BANK Group. Systematic coordination between all entities in the DZ BANK Group is necessary to ensure compliance with InstitutsVergV and other remuneration-related regulatory requirements. Company-law provisions and local rules – especially in relation to the independence of the subsidiaries – are also taken into account.

The remuneration strategy is reviewed and, if necessary, amended at least once a year. The following material changes to the remuneration strategy were made during the year under review.

The transfer of the business of DVB Bank SE to DZ BANK AG on August 12, 2022 meant that DVB's remaining employees were transferred to DZ BANK. The remuneration strategy of DZ BANK has applied to them since the transfer. Any deferred remuneration of the transferred employees resulting from past years will be granted in accordance with the rules previously in place at DVB.

To mitigate the impact of the rise in consumer prices, the German government provided the option to make an inflation compensation payment to employees that was not subject to tax or social insurance contributions. In 2022, the entities in the DZ BANK Group exercised this option in some cases and did make such a payment.

15.2.2 Integration of corporate strategy and remuneration strategy

The integration of the corporate strategy and the remuneration strategy at DZ BANK and in the DZ BANK Group is ensured by defining entity targets on the basis of the strategic planning. During the annual target agreement process, targets are agreed with the members of the Boards of Managing Directors and the managing directors in the subgroups. These targets are based on the DZ BANK Group's strategic planning. The subordinated entities then filter these targets through to the lower hierarchy levels via a cascading structure, ensuring that the DZ BANK Group's strategic objectives can be achieved.

The strategic planning involves drawing up, evaluating, confirming, and/or adjusting the corporate strategy, carrying out the strategic financial and capital planning, and integrating them with the risk strategies and other strategies for a planning horizon of four years. All elements are updated annually. The strategic planning process highlights the interrelationships between the corporate strategy and the strategic financial and capital planning, the risk strategies, and other strategies. Sustainability aspects are also discussed during the strategic planning process, for example with regard to the scenarios and the business environment analyses and KPIs for climate-related and environmental risks. As part of the planning, which constitutes the operationalization of the corporate strategy (including the financial and capital planning and integration with the risk strategies and other strategies), the DZ BANK Group makes sure – taking account of its chosen risk appetite over a medium-term observation period – that it always has an adequate level of capital (including to cover stress test scenarios).

15.2.3 Corporate culture and sustainability

The remuneration strategy is closely linked to the DZ BANK Group's corporate culture. The DZ BANK Group is committed to upholding high ethical and professional standards that are documented in a written set of procedural rules. Its actions are underpinned by the values of the cooperative movement. These values are taken into account when defining the strategic requirements in the business strategy. The DZ BANK Group's code of conduct and risk culture policy lay the foundations for the way in which employees and managers treat each other and customers on a day-to-day basis and the way in which they approach risks.

Sustainability is embedded in the strategy of the DZ BANK Group at several different levels: as a priority topic for the strategic planning process, as a groupwide area of potential, and as a self-contained implementation package under the 'Verbund First 4.0' initiative of DZ BANK.

The sustainability guidelines developed by and for the Volksbanken Raiffeisenbanken cooperative financial network in 2020 provide a framework for all of its sustainability activities. They state that the cooperative financial network derives its strength from shared cooperative roots and values – such as solidarity, partnership, and trust – and from an open and transparent culture.

The idea of forming cooperatives to benefit from collective protection against risks and create a link between financial success and social welfare has been around for more than 170 years, and yet, it has never been more relevant. Cooperatives operate in a sustainable and responsible manner. They help to put innovative ideas into practice, support their members, and are firmly rooted in their region. The cooperative financial network's sustainability guidelines highlight the positive impact of cooperative practices on society in the context of the current challenges of sustainable development and complement the existing body of corporate values that the group entities uphold. This body of values includes the groupwide code of conduct, which requires all executives and employees of the DZ BANK Group to act in compliance with the law and ethical standards.

In 2019, DZ BANK AG defined eight values that serve as guiding principles for the further development of its corporate culture. These include innovation, consistency, performance, courage, partnership, security, cosmopolitanism, and also sustainability as a hallmark of long-term thinking and responsible conduct. Upholding these values means always taking the consequences for the bank and its environment into consideration when making decisions.

Most group entities also have their own corporate principles and values that are typically rooted in the cooperative values and take account of sustainability. Further details can be found in the sustainability reports and on the websites of the individual group entities.

The DZ BANK Group's remuneration systems are designed in a way that supports its sustainability-oriented culture and strategy. The remuneration does not incentivize excessive risk-taking in any way.

15.2.4 Remuneration structure

The remuneration of employees in the DZ BANK Group comprises fixed remuneration and, as a rule, variable remuneration.

The level of fixed remuneration is determined by the importance of the employee's role, market conditions, and the employee's personal abilities. Further remuneration components may also be granted, depending on the entity. Examples include an occupational pension scheme, an employer-funded capital-formation scheme, travel subsidies, and subsidized travel cards.

The level of variable remuneration reflects – depending on the remuneration system – the employee's personal performance, the entity's success, and the success of the division in which the employee works.

Depending on local custom, the DZ BANK Group offers additional non-cash benefits besides the salary payments.

As a rule, variable remuneration does not exceed fixed remuneration at the institutions in the DZ BANK Group. The exception is DVB, where a resolution adopted by the Annual General Meeting in 2014 capped the variable remuneration for defined sites and positions at 200 percent of fixed remuneration. This resolution remained in force until DVB was wound up in August 2022.

In some cases, variable remuneration has been capped at well below fixed remuneration. In the institutions, the variable remuneration of employees in control units may not exceed 50 percent of their fixed remuneration.

In accordance with section 5 (5) InstitutsVergV, variable remuneration is guaranteed for no more than the first twelve months after an employee has joined the DZ BANK Group.

Severance pay is granted only within the scope of section 5 (6) InstitutsVergV. Principles governing severance pay have been defined in the institutions in the DZ BANK Group.

In accordance with the provisions of InstitutsVergV, the remuneration systems includes a ban on hedging in relation to variable remuneration.

Variable remuneration is subject to the requirements of InstitutsVergV. In accordance with section 18 (1) sentence 3 InstitutsVergV and article 94 (3) CRD, variable remuneration of risk takers that does not exceed €50 thousand is exempted from the special requirements in InstitutsVergV. Moreover, since the introduction of the new version of InstitutsVergV dated September 25, 2021, these special requirements in InstitutsVergV have not had to be applied to the variable remuneration of risk takers provided that it does not constitute more than a third of their total annual remuneration.

In accordance with section 7 InstitutsVergV, the total amount of variable remuneration at DZ BANK AG and in the DZ BANK Group must be determined in such a way that takes due regard of risk-bearing capacity, multi-year capital planning, and financial performance and, moreover, must ensure that the adequacy of own funds and liquidity along with the combined capital buffer requirements pursuant to section 10i KWG are permanently maintained or restored. At DZ BANK, these requirements are fulfilled through the use of checklists containing criteria that have to be met in order for variable remuneration to be paid. All of the criteria have to be met. One of the key figures used is risk-bearing capacity in the form of capital adequacy. The remuneration systems in the DZ BANK Group thus take account of current and future risks.

The DZ BANK Group ensures fair remuneration and implements the requirements of the German Remuneration Transparency Act. The entities that are subject to the Remuneration Transparency Act published a report on fair remuneration for the first time in 2017. Under this legislation, reporting is required every five years from 2018. The next report, covering the period 2017 to 2021, will be published with the 2022 management report.

15.2.5 Remuneration decision-making processes

Various committees and functions in the institutions in the DZ BANK Group are involved in designing and monitoring the remuneration systems.

The design and implementation of the remuneration system for the Board of Managing Directors of a particular institution in the DZ BANK Group are decided upon by the Supervisory Board of the institution in question. The Supervisory Boards also check that the employee remuneration systems are appropriate.

Each Supervisory Board is assisted in its work by its Remuneration Control Committee, in particular with regard to the appropriate design and monitoring of the remuneration systems and their conformity with the business and risk strategies, remuneration strategy, and corporate culture of the DZ BANK Group.

Each Board of Managing Directors decides on the design and implementation of the employee remuneration systems. The individual members of the Boards of Managing Directors contribute to the implementation of and compliance with InstitutsVergV in the institutions in the DZ BANK Group through their membership of the Supervisory Boards of the subsidiaries.

In each entity, a remuneration officer assists the Remuneration Control Committee and Supervisory Board with their monitoring activities and is involved in deployment of the remuneration systems, the development of new systems, and the refinement of existing systems on a regular basis.

In each entity, the HR division carries out HR-related preparations for the design of the remuneration systems and the decisions of the Board of Managing Directors, which it also puts into practice. As part of their leadership and management role, managers deploy the performance management and remuneration tools provided to them.

The control units as defined by section 2 (11) InstitutsVergV are involved in the design and monitoring of the remuneration systems on an ongoing basis. Each institution in the DZ BANK Group has defined its control units. The institutions make sure that employees in the control units are remunerated independently of the divisions that they oversee. Pursuant to section 5 (4) InstitutsVergV, this is the case if the amount of variable remuneration of employees in the control units and of employees in the organizational units overseen by them is not predominantly determined by the same remuneration parameters and there is no risk of a conflict of interests.

At DZ BANK, the following divisions are defined as control units: Credit, Group Risk Management & Services, Group Risk Controlling, Compliance, and Group Audit.

At BSH, it is the Internal Audit, Risk Controlling, and Compliance divisions.

DVB defined its control units as follows: Credit Shipping, Credit Quality Assessment, Group Audit, Group Compliance Office, Group Controlling, Group Risk Management, and Operational Services.

The following divisions at DZ HYP are defined as control units: Back Office Corporate Clients, Back Office Treasury and Public Sector, Risk Controlling, Compliance, Internal Audit, and Finance.

At DZ PRIVATBANK, it is the Risk Controlling, Internal Audit, and Compliance divisions.

15.2.6 Remuneration Control Committee

Section 25d KWG requires the supervisory bodies of major institutions to appoint a remuneration control committee. The Remuneration Control Committee (RCC) checks that the remuneration systems for members of the Board of Managing Directors and for employees are designed appropriately. In particular, it checks that remuneration is designed appropriately for the heads of the risk control and compliance functions and for those employees who have a material influence on the institution's overall risk profile. The RCC also assists the Supervisory Board with checking that the remuneration systems for the entity's employees are designed appropriately and it evaluates the impact of the remuneration systems on the management of risk, capital, and liquidity.

The RCC prepares the Supervisory Board's resolutions on the remuneration of the members of the Board of Managing Directors, taking particular account of the impact of the resolutions on the entity's risks and risk management. It also considers the long-term interests of shareholders, investors, and other stakeholders as well as the wider public interest.

The RCC helps the Supervisory Board to check that the internal control units and all other relevant divisions are duly involved in designing the remuneration systems.

The RCC is required to cooperate with the Risk Committee.

The Supervisory Board's RCC, in cooperation with the remuneration officer, monitors the appropriateness of the remuneration systems.

In 2022, the RCC at DZ BANK held four meetings. The Supervisory Board was notified of the findings. The RCC is made up of members of the Supervisory Board. DZ BANK's RCC comprises a chairman, deputy chairman, and four other members.

The RCC at BSH met twice in 2022. BSH's RCC comprises a chairman and five other members.

The RCC at DVB met twice in 2022. It comprised a chairman, deputy chairman, and one other member. DVB's RCC ceased to exist when DVB was merged with DZ BANK AG.

DZ HYP's RCC comprises four Supervisory Board members. It has a chairman and three other members, one of whom is an employee representative. In 2022, the RCC at DZ HYP held three meetings and the Supervisory Board received reports on these meetings.

At DZ PRIVATBANK, the role of the RCC is performed by the Chairman's Committee. In the reporting year, the Chairman's Committee held three meetings, with RCC matters being discussed at all of them. The Chairman's Committee at DZ PRIVATBANK comprises a chairman, deputy chairman, and two other members.

15.2.7 Remuneration officer

In accordance with the requirements of section 23 InstitutsVergV, a remuneration officer and a deputy remuneration officer have been appointed by the Board of Managing Directors in all entities in the DZ BANK Group that are deemed major pursuant to section 1 (3c) KWG.

The main tasks of these remuneration officers include the ongoing verification and monitoring of the appropriateness of the remuneration systems, regular and close coordination with the chairman of the Remuneration Control Committee, and preparation of an annual remuneration control report. To this end, they work closely with the other control and monitoring functions.

15.2.8 Relevant stakeholders

When it comes to defining remuneration policy, the relevant stakeholders are the owners and the central employees' council. The owners are represented on the Supervisory Board by the shareholders elected by the Annual General Meeting. This ensures that the owners are involved in the design of the remuneration systems and receive information about employee remuneration annually. The central employees' council is involved in the design of the remuneration systems within the framework of the rights of participation that exist under the German Works Council Constitution Act (BetrVG).

15.2.9 External consultancy

In 2022, all entities in the DZ BANK Group that are deemed major pursuant to section 1 (3c) KWG engaged external consultants to examine how the remuneration of the Board of Managing Directors compared with the market standard.

In addition, external consultants were engaged as follows:

Entity	Organizational unit that engaged the consultants	Aspects of remuneration covered by the engagement
DZ BANK	/	/
BSH	HR division	Remuneration benchmark
DVB	/	/
DZ HYP	/	/
DZ PRIVATBANK	/	/

15.2.10 Appropriateness of the remuneration systems

According to section 12 InstitutsVergV, the appropriateness of the remuneration systems must be reviewed at least once a year. The related internal audit reports, the audit report from the auditor of the annual financial statements, and the remuneration officer's remuneration control report have to be used as the basis for this review.

DZ BANK

DZ BANK's Board of Managing Directors confirmed the appropriateness of the remuneration systems in November 2022. Overall, DZ BANK's remuneration systems are deemed appropriate in accordance with the requirements in InstitutsVergV and are consistent with the business and risk strategies. The design, application and, in particular, the outcome of the remuneration systems show that there are no incentives for employees to take on disproportionately high risks. The remuneration systems do not run counter to the control units' monitoring function. Moreover, the remuneration systems of DZ BANK are consistent with the group remuneration strategy.

The most recent audit report from the auditor of the annual financial statements did not contain any indications that DZ BANK's remuneration systems – including the remuneration strategy – were not suited to supporting the institution's strategic objectives or its strategic development or that the remuneration parameters were not aligned with the business strategy and risk strategy. The bank's remuneration systems are appropriate and transparent. In particular, the institution met the requirements pursuant to section 25a (5) KWG regarding the determination of an appropriate balance between the variable and fixed annual remuneration. There were no indications that the special requirements for the remuneration systems of major institutions had not been met. With the exception of insufficient written process documentation, there were no indications that the requirements regarding the definition of a groupwide remuneration strategy and the groupwide implementation of the regulatory requirements for remuneration systems had not been met.

The DZ BANK remuneration officer's remuneration control report for 2022 found that the remuneration systems were designed appropriately.

In 2022, Internal Audit did not audit DZ BANK's implementation of InstitutsVergV.

BSH

The review of the appropriateness of BSH's remuneration systems was based on the internal audit reports, the audit report from the auditor of the annual financial statements, and the remuneration officers' remuneration control report. This review found that BSH's remuneration systems complied with the requirements of InstitutsVergV. The Board of Managing Directors confirmed the appropriateness of the remuneration systems.

DVB

The report from the auditor of DVB's annual financial statements for 2022, the audit by Internal Audit, and the remuneration control report of the remuneration officers found that the remuneration systems were designed in accordance with the requirements of InstitutsVergV.

DZ HYP

DZ HYP's Board of Managing Directors confirmed the appropriateness of the remuneration systems in accordance with the requirements in InstitutsVergV in May 2022. The DZ HYP remuneration officer's remuneration control report for 2022 found that the remuneration systems were designed appropriately. At its second meeting, DZ HYP's RCC reviewed the remuneration policy of DZ HYP and found that the remuneration systems for the managing directors and employees – particularly senior managers, the head of the risk control function, the compliance function, and risk takers – were designed appropriately. This also applied when taking the impact on the bank's management of risk, capital, and liquidity into consideration. The RCC also examined the remuneration of employees in the control units and found that it complied with the requirements in InstitutsVergV. The most recent audit report from the auditor of the annual financial statements found that DZ HYP's remuneration systems were appropriate and transparent.

DZ PRIVATBANK

At DZ PRIVATBANK, the appropriateness of the remuneration systems is verified annually by the institution's remuneration officer in preparation for the annual remuneration control report to the Supervisory Board. In addition, Internal Audit carries out an audit every three years (most recently in 2021) as part of DZ BANK's group internal audit of the implementation of InstitutsVergV. The review of appropriateness found that DZ PRIVATBANK's remuneration systems complied with the requirements of InstitutsVergV and with the local regulatory requirements. The remuneration systems are appropriate and aligned with the business and risk strategies. They do not incentivize employees to take on disproportionately high risks. The remuneration systems do not run counter to the control units' monitoring function and are aligned with the corporate culture.

15.3 Design of the remuneration systems at DZ BANK

15.3.1 General principles

This report describes DZ BANK's remuneration system. Section 15.3.2 describes systems with variable components and other non-cash benefits that apply to employees in the collectively-negotiated (CN) and non-collectively-negotiated (NCN) wage sectors alike. A description of the remuneration model for employees in the CN wage sector is then provided (see section 15.3.3), followed by a description of the remuneration systems for employees in the NCN wage sector. There are differences between regular NCN remuneration (see section 15.3.4), the remuneration of risk takers below the level of head of division (see section 15.3.5), and the remuneration system for heads of division (see section 15.3.6). The remuneration systems for the foreign branches are presented in section 15.3.7. Section 15.3.8 contains a description of the remuneration system for members of the Board of Managing Directors and section 15.3.9 describes the remuneration of the members of the Supervisory Board.

DZ BANK ensures fair remuneration and implements the requirements of the German Remuneration Transparency Act. Internal analysis is carried out every year as part of the bonus and pay review in order to uncover any discrimination at an early stage and enable corrective action to be taken. The analysis looks at criteria such as age and period of service, as well as gender. The employee representatives are informed of all pay rises in advance, in accordance with the company agreement, and are given the opportunity to comment if they suspect arbitrary decisions or discrimination.

At the level of the members of the Board of Managing Directors, 25 percent of the targets relate to sustainability criteria. These targets, which are generally qualitative in nature, can be broken down into environmental (10 percent), social (10 percent), and corporate governance (5 percent) topics. For heads of division, at least 12.5 percent of the targets relate to sustainability (ESG). Sustainability is also taken into account when setting the AG factor, which means it is relevant to all employees in the NCN wage sector. Consequently, sustainability plays a part in the remuneration of all such employees. In addition, managerial staff are advised and trained to agree personal targets with their employees that promote sustainable practices at DZ BANK.

15.3.2 Systems with variable components and other non-cash benefits

Inflation compensation payment

To mitigate the impact of the rise in consumer prices, the German government provided the option to make an inflation compensation payment to employees that was not subject to tax or social insurance contributions. In 2022, DZ BANK AG exercised this option in some cases and did make such a payment.

Manager allowance

Pursuant to section 2 (6) sentence 3 no. 2 InstitutsVergV, employees who temporarily assume a more demanding duty, function, or organizational responsibility may receive an allowance for this. The manager allowance amounts to 10 percent of the employee's reference salary. The allowance is paid monthly in addition to the fixed salary in the form of a non-pensionable allowance. If an employee works part time, the allowance is paid pro rata in line with the number of hours worked.

Performance recognition bonus

The bank grants monetary bonuses – known as performance recognition bonuses – in order to reward outstanding performance, creative or innovative ideas, and particularly exemplary engagement or action to support the corporate culture.

The performance recognition bonuses are distributed on a discretionary basis by the relevant head of division. They are awarded for outstanding performance that is not already covered by the employee's individual target agreement. Risk takers cannot be awarded a performance recognition bonus.

To underline the exceptional nature of this reward, no more than 5 percent of the employees in a division can receive the bonus in any one year. The individual payments range from €500 to €5,000 gross.

No variable remuneration in the form of shares or options is granted.

15.3.3 Remuneration system for employees in the collectively-negotiated wage sector

The remuneration system for employees in the collectively-negotiated CN) wage sector generally applies to any employee in the CN wage sector who is in an active employment relationship at any of DZ BANK's offices in Germany. The remuneration for such employees is governed by a company agreement.

Remuneration structure

The annual salary of employees in the CN wage sector consists of the following:

- Twelve monthly salaries (plus any CN or non-collectively negotiated (NCN) allowances)
- Bonus equal to one month's salary in April
- Bonus equal to one month's salary in November

Monthly salary and bonuses

The monthly salary is determined by the applicable remuneration group (A1 to C3) and the number of years of service. The monthly salary is paid twelve times a year. It may also include CN and/or NCN allowances.

The level of the bonuses in April and November is determined by the monthly salary in the month of payment according to the CN remuneration table.

There are also financial and non-financial remuneration components that are designed to promote staff loyalty, such as an occupational pension scheme.

15.3.4 Remuneration system for employees in the non-collectively-negotiated wage sector

DZ BANK's NCN remuneration systems are aimed at providing appropriate rewards and additional performance incentives in the form of fixed salaries and an additional variable remuneration component. The idea is that good performance should pay off.

The remuneration for employees in the NCN wage sector is governed by a company agreement and applies to all such employees at DZ BANK in Germany (excluding senior managers). The majority (76.7 percent) of employees are in the NCN wage sector.

In addition to the fixed salary paid as twelve monthly salaries, the remuneration structure for employees in the NCN wage sector includes a contractually agreed performance- and results-based remuneration component (bonus) and a process for rating role importance (responsibility levels).

There are also financial and non-financial remuneration components that are designed to promote staff loyalty, such as an occupational pension scheme.

System of responsibility levels

Each role at DZ BANK that is not covered by a CN pay agreement is rated according to knowledge/ability, problem-solving, responsibility, and strategic importance and then assigned to one of five responsibility levels. The percentage share represented by the target bonus and the lower and upper limits for the employee's remuneration depend on the responsibility level to which his or her role is assigned. The upper limits for variable remuneration are derived from the contractually agreed target bonuses and the upper limits for the bonus factors. Reflecting the market situation, DZ BANK may define special markets (e.g. the capital markets) for specific divisions, departments, groups, or roles. In these special markets, the target bonus may be agreed as a larger percentage share relative to the fixed salary. Under no circumstances may variable remuneration exceed fixed remuneration. The salary bands for each responsibility level are reviewed regularly and adjusted if necessary. The adjustments are based on the bank's market position and financial performance as well as on the wider economic situation.

The following terms are used with regard to the NCN remuneration system at DZ BANK:

Fixed salary:
The contractually agreed basic salary and any existing special allowances

Target bonus:
Amount agreed by the employee and his or her manager that provides the basis of calculation for the bonus

Reference salary:
Fixed salary plus target bonus

Fixed allowance:
The fixed allowance is derived from the lower limits of the bonus factors (AG factor of 0.8, divisional factor of 0.8, IPF of 0.8). When deducted from the target bonus, it equates to 51.2 percent of the target bonus (0.8 x 0.8 x 0.8 = 0.512). This share of the target bonus is fixed and is paid monthly with the fixed salary.

Fixed remuneration:
Total of fixed salary plus fixed allowance

Bonus factors:
The AG factor and divisional factors reflect the results of the bank/group and divisions. The IPF indicates the employee's rate of target achievement.

Bonus:
Variable remuneration component calculated from the bonus factors and the target bonus less the fixed allowance

The factors fall to below 1.0 if performance and success targets of the DZ BANK Group, DZ BANK, or the divisions and/or individual performance and success targets are not achieved. This reduces the amount of variable remuneration.

Target agreement and target achievement

The basis for a transparent and clearly documented performance appraisal, and thus for determination of the individual performance factor (IPF), is a target agreement process that is applied throughout the bank. 'Management by objectives' is the target agreement system used at DZ BANK and constitutes a key element of the variable remuneration system. The employee and his or her manager together agree on three to five specific, challenging, and measurable individual targets by March 1 of the respective year. These targets are given weighting factors and deadlines. They consist of qualitative targets and quantitative targets based on profitability KPIs. The agreed targets must be derived from the business, risk, and sustainability strategies.

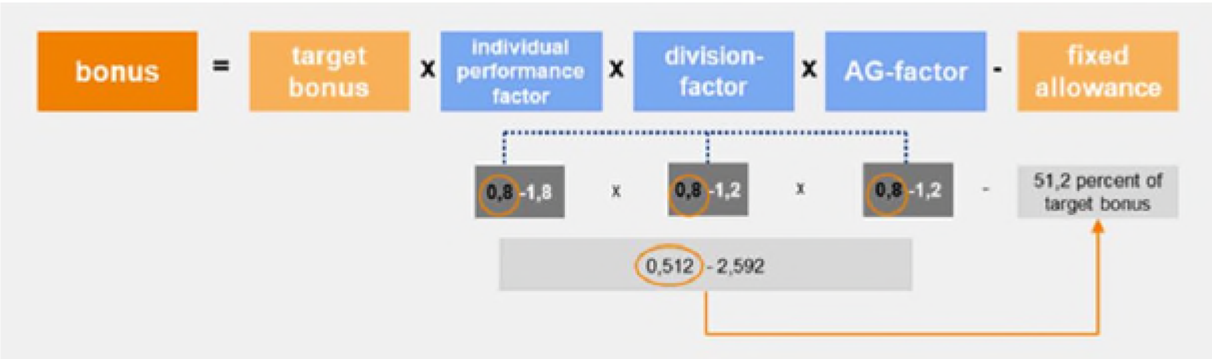
When calculating the bonus, the aim is to both recognize employees' high level of dedication and enable them to share in the success of their division and of DZ BANK as a company. That is why the bonus is determined using further performance factors in addition to the AG factor and divisional factors.

The IPF ranges from 0.8 to 1.8 and is set on the basis of the employee's personal target achievement during the annual performance review with his or her manager. The breadth of the IPF range enables employees to have a direct influence on their bonus. The divisional factor ranges from 0.8 to 1.2 and is set by the responsible member of the Board of Managing Directors in consultation with the rest of the Board of Managing Directors on the basis of the head of division's suggestion and the division's results. The AG factor also ranges from 0.8 to 1.2 and is set by the Board of Managing Directors on the basis of the bank's and group's results. This structure also ensures that employees in the control units are remunerated independently of the employees in the divisions that they oversee. Because the divisional factor and the individual performance factor of employees in the control units and of employees in the organizational units overseen by them are subject to different parameters, the amount of variable remuneration is not predominantly determined by the same remuneration parameters. Fundamentally, there is also no risk of a conflict of interests because the divisional factors and individual target agreements are determined in accordance with the divisions' individual strategies, which pursue different objectives.

Calculation of the variable component

The IPF is set during the annual performance review by no later than March 1 of the following year on the basis of target achievement. The divisional factor and AG factor are determined by no later than March 31 of the following year. The following formula is used to calculate the bonus:

VARIABLE REMUNERATION = TARGET BONUS X IPF X DIVISIONAL FACTOR X AG FACTOR LESS FIXED ALLOWANCE (51.2 PERCENT OF THE TARGET BONUS)



The variable remuneration (less the fixed allowance) is paid with the April salary in the year following the year to which it applies. The fixed salary and the fixed allowance are paid in twelve equal monthly installments.

The variable remuneration may be paid only if the risk-bearing capacity, the multi-year capital planning, and the financial performance of DZ BANK and the DZ BANK Group permit.

15.3.5 Remuneration system for risk takers below the level of head of division

For the year under review, risk takers were identified in accordance with sections 1 (21) and 25a (5b) KWG and on the basis of Commission Delegated Regulation (EU) 2021/923 of March 25, 2021 supplementing Directive 2013/36/EU of the European Parliament and of the Council with regard to regulatory technical standards setting out the criteria to define managerial responsibility, control functions, material business units and a significant impact on a material business unit's risk profile, and setting out criteria for identifying staff members or categories of staff whose professional activities have an impact on the institution's risk profile that is comparably as material as that of staff members or categories of staff referred to in article 92 (3) of that Directive. The regulatory technical standards and KWG define binding qualitative and quantitative criteria that must be used to identify risk takers.

Using these criteria, 153 risk takers were identified at DZ BANK for the reporting period. A further 113 group risk takers from subordinate entities were identified for the DZ BANK Group.

The remuneration structure and, in particular, the bonus calculation for all employees below the level of head of division who have been identified as risk takers for DZ BANK are governed by the remuneration system for employees in the NCN wage sector (see section 15.3.4).

In accordance with the provisions of InstitutsVergV, some of a risk taker's variable remuneration is deferred and subject to a retention period if the variable remuneration exceeds €50 thousand or constitutes more than a third of his or her total annual remuneration. Of the total variable remuneration, 30 percent of the calculated bonus amount is paid to the employee with the April salary in the following year. A further 30 percent is subject to a one-year retention period. The other 40 percent of the calculated bonus is deferred over a period of four years. The deferred variable remuneration is split into four (each amounting to a quarter of the 40 percent). 50 percent of the deferred variable remuneration is subject to a retention period. During the deferral period, 50 percent of the level of deferred variable remuneration depends on the bank's long-term performance. During the retention periods, this percentage rises to 100 percent. The change in the value of DZ BANK's shares between April 15 and the applicable valuation date (April 14) is used to measure long-term performance. If the share price drops by more than 25 percent, the deferred portion of the bonus amounts to zero. If the share price falls by between 20 percent and 25 percent, the deferred portion of the bonus amounts to 50 percent; if the share price falls by 15 percent to 20 percent, the deferred portion of the bonus amounts to 75 percent. If the share price drops by less than 15 percent, the deferred portion of the bonus is 100 percent. None of DZ BANK's shares are traded on the market. Once a year, an external auditing firm calculates the value of the shares in accordance with the principles for conducting enterprise valuations pursuant to standard 1 (IDW S1) of the Institut der Wirtschaftsprüfer in Deutschland e.V. (IDW) [Institute of Public Auditors in Germany]. An increase in the share price does not result in higher variable remuneration.

Above a certain bonus amount, 40 percent of the variable remuneration is paid to the employee and 60 percent is deferred and subject to retention periods.

If the contribution to profits of an employee, his or her division, or DZ BANK falls short of the agreed targets, the employee's variable remuneration is reduced. In these cases, the IPF, divisional factor, or AG factor is set at below 1.0. If all factors are set at 0.8, the variable remuneration is cancelled. Before it becomes vested, deferred variable remuneration can be reduced or cancelled if the bonus factors that were originally set no longer appear appropriate when reviewed (backtesting).

Variable remuneration is forfeited in full if the risk taker has played a significant part in, or was responsible for, conduct that led to substantial losses, material regulatory sanctions, or a material supervisory measure for the institution, or if the risk taker was in serious (grossly negligent or intentional) breach of relevant external or internal rules regarding suitability and conduct. If, in exercising his or her role, the risk taker exhibits conduct that is immoral or in breach of duty, the IPF is reduced. The IPF can be lowered to zero in individual cases where a reduction of the IPF to 0.8 appears insufficient in view of the significance of the conduct that is immoral or in breach of duty. It is not possible to compensate for conduct that is immoral or in breach of duty by making a positive contribution to profits. Conduct that is immoral or in breach of duty must always lead to a reduction in the employee's variable remuneration. In cases where the variable remuneration is forfeited in full, the bank is also entitled to claw back any variable remuneration already paid to the risk taker.

15.3.6 Remuneration system for heads of division

All heads of division at DZ BANK are senior managers and have been identified as risk takers. Because they are senior managers, they are not covered by the company agreement for NCN remuneration. Their remuneration is governed by their employment contracts. In addition to a fixed salary, the remuneration system for heads of division includes a variable remuneration component (bonus). The variable remuneration of the heads of division is set with reference to a maximum achievable bonus. Targets derived from the corporate strategy in the form of group, bank, divisional, and individual targets are used to determine the bonus level. The maximum bonus is set in the event of full achievement of each individual target. The DZ BANK Board of Managing Directors is responsible for determining the remuneration system.

Some of the variable remuneration of heads of division is deferred and subject to a retention period. Of the total variable remuneration, 20 percent of the calculated bonus amount is paid to the head of division with the April salary in the following year. A further 20 percent is subject to a one-year retention period. The other 60 percent of the calculated bonus is deferred over a period of five years. The deferred variable remuneration is split into five (each amounting to a fifth of the 60 percent). The deferred variable remuneration is also subject to a one-year retention period. During the deferral period and retention periods, 100 percent of the level of deferred variable remuneration depends on the bank's long-term performance. The change in the value of DZ BANK's shares between April 15 and the applicable valuation date (April 14) is used to measure long-term performance. If the share price drops by more than 25 percent, the deferred portion of the bonus amounts to zero. If the share price falls by between 20 percent and 25 percent, the deferred portion of the bonus amounts to 50 percent; if the share price falls by 15 percent to 20 percent, the deferred portion of the bonus amounts to 75 percent. If the share price drops by less than 15 percent, the deferred portion of the bonus is 100 percent. None of DZ BANK's shares are traded on the market. Once a year, an external auditing firm calculates the value of the shares in accordance with IDW S1. An increase in the share price does not result in higher variable remuneration.

Unlike in the system for risk takers below the level of head of division, the greater responsibility of heads of divisions means that 100 percent rather than 50 percent of their variable remuneration is pegged to the value of DZ BANK's shares.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferred bonuses, which may cause the variable remuneration to be reduced or cancelled. Variable remuneration is not vested during the deferral and retention periods. For a period of seven years after they have been set, all bonus installments that are already subject to a retention or deferral period can be cancelled, and those that have already been paid can be clawed back, if the head of division has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution, or if the head of division was in serious breach of relevant external or internal rules regarding suitability and conduct.

Negative contributions to profits are determined using a list of criteria in the following categories:

- Personal conduct
- Significant deterioration in DZ BANK's financial situation during the deferral period
- Missed targets that are ascertained only subsequently

15.3.7 Remuneration systems for foreign branches

At DZ BANK's offices outside Germany, various variable components that differ from the systems used in Germany are paid along with a fixed salary in accordance with local custom and additional benefits.

Depending on the location, non-cash benefits that are typical for the particular market are also paid, for example housing allowances and healthcare contributions.

The heads of the foreign branches were identified as risk takers for the reporting year. The remuneration system described above for heads of division is also used for the heads of the four foreign branches.

The individual bonus amounts for employees at the offices outside Germany are calculated on the basis of the local systems. The remuneration of risk takers in the offices outside Germany is subject to the same principles as the remuneration of risk takers in Germany.

At the offices outside Germany, the provisions in InstitutsVergV are applied and, if stricter than the InstitutsVergV provisions, the provisions of local remuneration legislation are also applied.

FIG. 89 – OVERVIEW OF CURRENT BONUS ARRANGEMENTS IN THE FOREIGN BRANCHES

New York	For Group Treasury: target bonus system; calculated in the same way as in the German system on the basis of individual performance and the results of the division and bank For all other divisions: discretionary bonus payment; proposed bonuses reflect individual performance, the results of the branch and bank, the business unit in which the employee works, the employee's experience and seniority, market standards, and market benchmarks
London	For Group Treasury: target bonus system; calculated in the same way as in the German system on the basis of individual performance and the results of the division and bank For all other divisions: discretionary bonus payment; proposed bonuses reflect individual performance, the results of the branch and bank, the business unit in which the employee works, the employee's experience and seniority, market standards, and market benchmarks; a target bonus system continues to apply to employees of the former DVB
Singapore	For Group Treasury and for capital markets divisions: target bonus system; calculated in the same way as in the German system on the basis of individual performance and the results of the division and bank For all other divisions: discretionary bonus payment; proposed bonuses reflect individual performance, the results of the branch and bank, the business unit in which the employee works, the employee's experience and seniority, market standards, and market benchmarks
Hong Kong	For Group Treasury and for capital markets divisions: target bonus system; calculated in the same way as in the German system on the basis of individual performance and the results of the division and bank For all other divisions: discretionary bonus payment; proposed bonuses reflect individual performance, the results of the branch and bank, the business unit in which the employee works, the employee's experience and seniority, market standards, and market benchmarks

15.3.8 Remuneration system for members of the Board of Managing Directors

As well as a fixed salary, the remuneration system for the members of the Board of Managing Directors includes variable remuneration (bonus) that makes up no more than 20 percent of the total salary. The variable remuneration of the members of the Board of Managing Directors is set with reference to a maximum achievable bonus. Quantitative and qualitative targets derived from the corporate strategy in the form of group, bank, area of board responsibility, and individual targets are used to determine the bonus level. The basis of measurement for the bonus covers a period of several years. The maximum bonus is set in the event of full achievement of each individual target. The Supervisory Board of DZ BANK is responsible for determining the remuneration system for the members of the Board of Managing Directors.

Some of the variable remuneration of members of the Board of Managing Directors is deferred and subject to a retention period. Of the total variable remuneration, 20 percent of the calculated bonus amount is paid to the member of the Board of Managing Directors with the April salary in the following year. A further 20 percent is subject to a one-year retention period. The other 60 percent of the calculated bonus is deferred over a period of five years. The deferred variable remuneration is split into five (each amounting to a fifth of the 60 percent). The deferred variable remuneration is also subject to a one-year retention period. During the deferral period and retention periods, 100 percent of the level of deferred variable remuneration depends on the bank's long-term performance.

DZ BANK uses the change in the value of its shares between April 15 and the applicable valuation date (April 14) to measure long-term performance. If the share price drops by more than 12.5 percent, the deferred portion of the bonus amounts to zero; if it drops by between 12.5 percent and 7.5 percent, the deferred portion of the bonus is 50 percent. If the share price drops by less than 7.5 percent, the deferred portion of the bonus is 100 percent. None of DZ BANK's shares are traded on the market. As appropriate, the Supervisory Board can take account of movements in the share price that are attributable to exogenous factors (e.g. changes to the regulatory environment) when setting the deferred portion of the bonus. Once a year, an external auditing firm calculates the value of the shares in accordance with IDW S1. An increase in the share price does not result in higher variable remuneration.

Unlike in the system for risk takers below the level of head of division, the greater responsibility of members of the Board of Managing Directors means that 100 percent rather than 50 percent of their variable remuneration is pegged to the value of DZ BANK's shares.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferred bonuses, which may cause the variable remuneration to be reduced or cancelled. Variable remuneration is not vested during the deferral and retention periods. For a period of seven years after the initial payment, all bonus installments that are already subject to a retention or deferral period can be cancelled, and those that have already been paid can be clawed back, if the member of the Board of Managing Directors has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution, or if the member was in serious breach of relevant external or internal rules regarding suitability and conduct.

Negative contributions to profits are determined using a list of criteria in the following categories:

- Personal conduct
- Significant deterioration in DZ BANK's financial situation during the deferral period
- Missed targets that are ascertained only subsequently

A new type of defined contribution (DC) pension plan was introduced for newly appointed members of the Board of Managing Directors in 2022. Members of the Board of Managing Directors can choose to have the amount of the DC premium paid in cash, to be used however they wish ('cash option').

15.3.9 Remuneration system for members of the Supervisory Board

The Annual General Meeting of DZ BANK approved the adjustment of the remuneration and attendance fees for the Supervisory Board with effect from June 1, 2018. Each member of the Supervisory Board receives fixed annual remuneration, the level of which varies depending on whether they are a chairperson, deputy chairperson, or member of a committee. The members of the Supervisory Board committees also receive an attendance fee for each committee meeting that they attend. There is no variable remuneration.

15.3.10 Determination of the total amount of variable remuneration at DZ BANK

In accordance with section 7 InstitutsVergV, the total amount of variable remuneration at DZ BANK and in the DZ BANK Group is determined in such a way that takes due regard of risk-bearing capacity, multi-year capital planning, and financial performance and, moreover, ensures that the adequacy of own funds and liquidity along with the combined capital buffer requirements pursuant to section 10i KWG are permanently maintained or restored.

A detailed process has been adopted for this process and the various documents required have been submitted to the relevant decision-making bodies (Board of Managing Directors, Remuneration Control Committee, and Supervisory Board) for approval.

The performance-based variable remuneration is set at individual level in accordance with the company agreements concerning the remuneration systems or, where these agreements do not apply, on the basis of individual contracts.

15.4 Remuneration systems of the management units regarded as major pursuant to section 1 (3c) KWG

15.4.1 Relevant subsidiaries according to section 27 in conjunction with section 16 InstitutsVergV

DZ BANK, BSH, DZ HYP, DVB, and DZ PRIVATBANK are major institutions according to section 1 (3c) KWG. They must fulfill the disclosure requirements pursuant to section 16 (1) InstitutsVergV.

Under the current business model of DZ BANK and the DZ BANK Group, business risk is limited because earnings are broadly diversified across various customer groups and products. This is thanks to the combination of different customer groups (retail customers, corporate customers, institutional customers), a broad customer base (almost 800 cooperative banks and their approximately 30 million customers), a nationwide branch network (over 8,000 branches), and a comprehensive range of services (including asset management, retail and private banking, insurance, real estate finance/home savings, corporate banking, capital markets business). The overarching concept of a network-oriented central institution/financial services group shapes the actions and core business of the DZ BANK Group and is thus a central pillar of the remuneration strategy as well.

Remuneration is one of the DZ BANK Group's key HR management tools. The aims of the DZ BANK Group's remuneration structure are to

- give each employee an incentive to contribute personally to the sustainable implementation of the strategic objectives of the DZ BANK Group and the individual divisions on the basis of targets that are derived from the corporate strategy and cascaded down through the organization;
- reward performance without encouraging employees to take unwanted risks;
- attract talented employees, motivate them, and encourage them to remain in the DZ BANK Group;
- award equal pay to all employees who are doing the same job, are of equal merit, and have the same level of experience, irrespective of gender, age, origin, or other characteristics.

The DZ BANK Group is committed to the principles of sustainable, incentivizing, and risk-oriented remuneration. The remuneration systems also take account of statutory and regulatory requirements.

The remuneration systems of DZ BANK's subordinated entities that are deemed major pursuant to section 1 (3c) KWG are described below.

15.4.2 Remuneration systems at BSH

This section describes the remuneration systems in the BSH management unit. In addition to the building society, the BSH management unit includes Schwäbisch Hall Kreditservice (SHK) in Germany. The managing directors of Fundamenta-Lakáskassza Lakástakarékpénztár Zrt. (FLK) in Hungary are also included as group risk takers.

There are differences between the way in which the remuneration systems of managing directors are structured and the way in which those of employees in the CN wage sector, employees in the NCN wage sector, and risk takers below the level of the managing directors are structured. These remuneration systems are described below.

Besides the remuneration components listed below, there is no other remuneration in the form of shares, options, or other components of variable remuneration at BSH, SHK, and FLK.

At BSH and SHK, the Supervisory Board has resolved that the variable remuneration of all employees and the managing directors – at 100 percent target achievement – may not make up more than 25 percent of the total remuneration. Under no circumstances may variable remuneration exceed fixed remuneration.

To mitigate the impact of the rise in consumer prices, the German government provided the option to make an inflation compensation payment to employees that was not subject to tax or social insurance contributions. In 2022, BSH and SHK exercised this option and did make such a payment.

In addition to monetary remuneration, there are non-financial remuneration components at BSH, SHK, and FLK that are designed to promote staff loyalty, such as skills training, services from the health management team, and working arrangements that help employees to balance work and family life.

Hungarian remuneration legislation applies to FLK and its subsidiaries Fundamenta-Lakáskassza Pénzügyi Közvetitö Kft. and Fundamenta Erteklanc Ingatlanközvetitö es Szolgaltato Kft.

FLK applies the provisions of the German InstitutsVergV because it is a subordinated entity of BSH. And because it is a Hungarian building society, it is also subject to European rules that have been implemented in Hungarian law. FLK applies whichever provisions are the strictest. FLK's remuneration policy is based on the legal requirements.

Target agreement and target achievement

Company performance, as derived from the business, risk, and sustainability strategies, forms the basis for determining the variable remuneration of employees in the CN and NCN wage sectors. This is done using management-related KPIs that are important to a building society and reflect current and future risks. By taking RORAC, profit before taxes, and administrative expenses into account, the remuneration is linked to earnings figures, key risk indicators, and the liquidity situation.

The entity targets apply across the BSH and SHK entities and are set by the Board of Managing Directors or the managing directors. Target achievement ranges from 50 percent to 120 percent. The lower limit of 50 percent ensures payment of the 13th monthly salary guaranteed in the collectively negotiated wage settlement.

For risk takers, company performance is factored into target achievement at 75 percent and the achievement of group targets is factored in at 5 percent. The risk taker's individual targets and the targets of the organizational unit are each factored into target achievement at 10 percent. Target achievement ranges from 0 percent to 120 percent.

The individual targets and the targets of the organizational unit are discussed during the annual review, which includes a transparent and clearly documented performance appraisal and the setting of targets. Employees and managers jointly agree on targets and tasks derived from the business and risk strategies. The targets must be specific and ambitious, and measurement criteria and deadlines must be defined. Target achievement is then evaluated. Remuneration-relevant targets are factored into the determination of variable remuneration. If an employee's remuneration was deferred in the past, the original level of target achievement is reviewed.

Taking account of the individual targets and the targets of the organizational unit ensures that risk takers in the control units are remunerated independently of the employees in the divisions that they oversee. In the control units, the first, second and, in some cases, third management levels are classified as risk takers. The variable remuneration of employees in the CN wage sector and of some employees at the lower management level is based entirely on the achievement of entity targets. It was decided that this group of people do not have a material impact on the risk profile because decisions are generally made at a higher level or are made collectively within committees. The control mechanisms implemented mean that the employees have little possibility of influencing the achievement of entity targets and one individual employee would not have any influence. In view of the low proportion of variable remuneration relative to total remuneration and the fact that criminal intent would be needed in order to influence the entity targets, there is no conflict of interests for employees in the control units when the chance of higher variable remuneration is weighed up against the risk of criminal activity and its consequences.

The variable remuneration of employees in the control units at FLK is not determined by the same remuneration parameters as those applicable to the employees whom they oversee. The remuneration of employees in the control functions is independent of the remuneration in the organizational units that they oversee and is linked to the achievement of targets that have been set in respect of their tasks. In other words, remuneration parameters relating to risk management, compliance, security management, and internal audit have to be chosen in such a way that they do not jeopardize the objectivity and independence of these employees.

The remuneration of employees who perform internal control functions at FLK must predominantly consist of basic remuneration in order to underline the nature of their responsibilities. Where variable remuneration is decided upon for employees in internal control functions, performance must be determined separately from the performance of the divisions that they oversee.

Remuneration system for employees in the collectively-negotiated wage sector

The remuneration system for employees in the CN wage sector generally applies to any employee in the CN wage sector who is in an active employment relationship at any of BSH's or SHK's offices in Germany.

The remuneration of employees in the CN wage sector at BSH is based on the applicable collective pay agreements for the private banking sector and the number of years working in the profession. The annual salary consists of the following:

- 12 x monthly salary (plus any CN or NCN allowances)
- 2.1 x target achievement bonus (1 monthly salary in November, difference relative to the total amount of the target achievement bonus in April of the next year)

The remuneration of employees in the CN wage sector at SHK is based on the collective agreement for SHK. The annual salary consists of the following:

- 12 x monthly salary (plus any CN or NCN allowances)
- 2.0 x target achievement bonus (1 monthly salary in November, difference relative to the total amount of the target achievement bonus in April of the next year)

The performance-based remuneration includes the 13th monthly salary guaranteed in the collectively negotiated wage settlement. The variable proportion can be up to 1.2 monthly salaries. The process is governed by a company agreement.

Outstanding performance of employees in the CN wage sector can be rewarded by assigning them to an appropriate CN pay category and by means of allowances.

Remuneration system for employees in the non-collectively-negotiated wage sector

The remuneration of employees in the NCN wage sector comprises a pensionable basic salary plus a fixed remuneration component (not pensionable) and a target achievement bonus. Outstanding performance is recognized by means of salary increases.

The level of remuneration is oriented to external benchmarks that are collated for BSH regularly.

The target achievement bonus is determined as follows:
Amount paid as a target achievement bonus = target achievement x (target achievement bonus + fixed remuneration)/100 – fixed remuneration

Remuneration of risk takers below the level of managing director at BSH

The remuneration of risk takers below the level of managing director at BSH and SHK (including managing directors at SHK) comprises a pensionable basic salary, a fixed non-pensionable remuneration component, and a target achievement bonus.

Target achievement ranges from 0 percent to 120 percent. Target achievement, which is used to determine the level of variable remuneration, is broken down as follows: 75 percent entity targets, 5 percent DZ BANK Group target, 10 percent targets for the organizational unit, and 10 percent individual targets. The breakdown for the managing directors of SHK is the same as for the members of the Board of Managing Directors of BSH; all targets are measured over a one-year period. In accordance with the provisions of InstitutsVergV, the remuneration system for risk takers includes a ban on hedging.

Because the target system, which reflects the change in enterprise value, is combined with the deferral and retention of some of the remuneration, the remuneration is also linked to the entity's long-term performance.

Where the currently applicable exemption threshold of €50 thousand is reached or exceeded, the arrangements regarding deferrals, retention periods, and malus criteria are the same as in the system for the managing directors. For a period of two years after the end of the final deferral period, a bonus installment already paid can be clawed back, and the entitlement to bonus payments can be cancelled, if the risk taker has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution or if the risk taker was in serious breach of relevant external or internal rules regarding suitability and conduct.

The Board of Managing Directors is responsible for determining the remuneration system for risk takers below the level of the Board of Managing Directors. The control units (Internal Audit, Risk Controlling, Compliance) and the remuneration officer were involved in designing the remuneration systems.

Remuneration of managing directors

The remuneration of the BSH Board of Managing Directors consists of a basic salary, a non-pensionable basic salary, and a bonus. Variable remuneration – at 100 percent target achievement – is not more than 25 percent of the total remuneration.

Target achievement ranges from 0 percent to 150 percent. Target achievement, which is used to determine the level of variable remuneration, is broken down as follows: 65 percent entity targets, 15 percent sustainability targets (including HR targets), and 20 percent individual targets, factoring in the contribution to profits of the managing director's area of responsibility and group targets. All of the targets are measured over a period of several years and include the main targets in the corporate strategy. The parameters factored into the remuneration are management-related KPIs that are important to a building society.

In accordance with the provisions of InstitutsVergV, some of a risk taker's variable remuneration is deferred and subject to a retention period if the variable remuneration exceeds €50 thousand. 20 percent of the bonus is paid immediately in the following year and 20 percent after a one-year retention period. 60 percent of the bonus is deferred over a period of up to five years, with each payment made after a subsequent retention period of one year. All amounts earmarked for deferred payment are pegged to the long-term change in the enterprise value as measured by the change in the notional share price of the building society. The change in the value of the BSH Group's shares and in its enterprise value between April 16 and the applicable valuation date (April 15) is used to measure long-term performance. None of BSH's shares are traded on the market. Once a year, an external auditing firm calculates the value of the shares in accordance with IDW S1. An increase in the share price does not result in higher variable remuneration.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferrals and at the end of the retention period, which may cause the variable remuneration to be reduced or not be paid.

Negative contributions to profits are determined using a list of criteria in the following categories:

– Personal conduct
– Significant deterioration in the BSH Group's financial situation during the deferral period
– Missed targets that are ascertained only subsequently

Variable remuneration is not vested during the deferral period or retention period.

For a period of two years after the end of the final deferral period, a bonus installment already paid can be clawed back, and the entitlement to bonus payments can be cancelled, if the managing director has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution or if the managing director was in serious breach of relevant external or internal rules regarding suitability and conduct.

The Supervisory Board is responsible for determining the remuneration system for the members of the Board of Managing Directors. The remuneration systems were designed in consultation with DZ BANK; the legal affairs division was involved in drafting the employment contracts for the members of the Board of Managing Directors. The Remuneration Control Committee of the Supervisory Board monitors the appropriateness of the remuneration systems.

The remuneration of the Board of Managing Directors of FLK in Hungary consists of basic remuneration and a bonus. Variable remuneration accounts for 33 percent of the basic remuneration.

Target achievement ranges from 0 percent to 150 percent. Target achievement, which is used to determine the level of variable remuneration, is broken down as follows: 80 percent entity targets, 10 percent targets for the area of responsibility of the member of the Board of Managing Directors, and 10 percent individual targets. Some of the entity targets are measured over a period of several years. The criteria for target achievement are derived from the rules specified in a regulation of the Hungarian government.

A risk taker's variable remuneration is deferred and subject to a retention period if the variable remuneration exceeds HUF 15 million. 20 percent of the bonus is paid immediately in the following year and 20 percent after a one-year retention period. 60 percent of the bonus is deferred over a period of up to five years. Half of each deferred amount is subject to a subsequent retention period of one year. All amounts earmarked for deferred payment are pegged to the change in the average profit before taxes for the last five financial years. Negative contributions to profits are taken into account when setting bonuses and amounts earmarked for deferred payment and at the end of the retention period, which may cause the variable remuneration to be reduced or forfeited in full. In cases where the variable remuneration is forfeited in full, the bank is also entitled to claw back any variable remuneration already paid to risk takers.

Variable remuneration is not vested during the deferral period or retention period.

The Supervisory Board is responsible for determining the remuneration system for the members of the Board of Managing Directors. The remuneration systems were designed in consultation with BSH. The Remuneration Committee of the Supervisory Board monitors the appropriateness of the remuneration systems.

15.4.3 Remuneration systems at DZ HYP

There were no significant changes to the remuneration systems in the year under review.

Remuneration strategy at DZ HYP

Within the framework of the groupwide remuneration strategy of the DZ BANK Group, the Board of Managing Directors of DZ HYP drew up a remuneration strategy for DZ HYP that is oriented to achievement of the targets defined in the bank's business and risk strategies. The corporate culture is also taken into account.

DZ HYP's strategy applies to all of the bank's sites and divisions in Germany. DZ HYP has no subsidiaries and no branch offices in third countries.

The remuneration strategy is reviewed and, if necessary, amended at least once a year. There were no material changes to DZ HYP's remuneration strategy during the year under review.

DZ HYP's remuneration systems are designed in a way that is geared to the achievement of DZ HYP's targets and are in line with the bank's risk appetite. The main risks at DZ HYP are credit risk and market risk. Other material risks are operational risk, liquidity risk, equity investment risk, business risk, reputational risk, and actuarial risk. Because the capital waiver pursuant to section 2a (5) KWG in conjunction with article 7 (1) CRR applies to DZ HYP, DZ HYP is included in the methods and models used by the DZ BANK Group to measure and manage risk. DZ HYP's risk-bearing capacity on a standalone basis is not calculated. Instead, contributions to profits are included in the DZ BANK Group's consolidated profit and affect the group's risk-bearing capacity.

DZ HYP strives for robustness, a focus on values, and sustainability. The remuneration systems take account of these aims by not offering any incentives to take on disproportionately high risks. They encourage conduct that is in line with DZ HYP's system of values. The remuneration models therefore help to strengthen a robust, values-oriented, and sustainable risk culture.

The integration of the business and risk strategies with the remuneration strategies is ensured by deriving entity targets from the strategic planning. The strategic planning involves drawing up, evaluating, confirming, and/or adjusting the corporate strategy, carrying out the strategic financial and capital planning, and integrating them with the risk strategies and other strategies for a planning horizon of four years. All elements are updated annually.

During the annual target agreement process, targets are agreed with the members of the Boards of Managing Directors. These targets are based on the DZ BANK Group's and DZ HYP's strategic planning. These targets are then filtered through to the lower hierarchy levels via the cascading structure initiated by the Board of Managing Directors, helping to ensure that the DZ BANK Group's and DZ HYP's strategic objectives can be achieved.

Sustainability targets

In its sustainability strategy, DZ HYP makes a commitment to the UN sustainable development goals (SDGs), the Paris climate agreement, and the German government's sustainability strategy. Through its sustainability efforts, DZ HYP aims to maintain prime status in the ISS ESG rating, which it has held since 2014, and to develop sustainability-oriented products, such as the green Pfandbrief that was successfully issued at the start of 2022. To achieve this, DZ HYP developed various targets in the key areas of action – sustainable banking business, operational environmental protection, employees, and corporate citizenship – and defined the related levels of ambition for achieving them. In addition, KPIs for portfolio composition and for the climate-related and environmental risks in the portfolio are being determined and will also be assigned an ambition level.

Of the variable remuneration of the members of the Board of Managing Directors, 15 percent is linked to sustainability targets, i.e. environmental, social, and corporate governance (ESG) targets. The sustainability targets are generally qualitative in nature for all members of the Board of Managing Directors. Where it appears appropriate, sustainability targets can also be agreed as part of their area of board responsibility targets and individual targets. The cascading structure means that corresponding sustainability targets are also included in the target agreements of a number of heads of division. The sustainability targets at the level of head of division filter through to the lower hierarchy levels via a cascading structure. Managerial staff are advised and trained to agree personal targets with their employees that promote sustainable practices at DZ HYP. This is helping sustainable thinking and behavior to become embedded at DZ HYP. Consequently, the groupwide remuneration strategy and DZ HYP's remuneration strategy comply with the provisions concerning the integration of sustainability risks in article 5 of Regulation (EU) 2019/2088.

Fair pay

DZ HYP ensures fair remuneration and implements the requirements of the German Remuneration Transparency Act. DZ HYP's remuneration systems are gender-neutral, thereby excluding the possibility of gender discrimination in terms of pay for equal or equivalent work.

Risk takers at DZ HYP

DZ HYP conducted an analysis as at March 1, 2022 in order to identify the risk takers within the meaning of section 25a (5b) sentence 2 KWG that was based on the criteria set out in section 1 (21) and section 25a (5b) sentence 1 nos. 1 to 3 KWG and articles 5 and 6 of Delegated Regulation (EU) 2021/923. The members of the Supervisory Board, the members of the Board of Managing Directors, and all heads of division at DZ HYP were identified as risk takers. Below the level of head of division, further employees were identified as risk takers on the basis of the qualitative criteria in article 5 of Delegated Regulation (EU) 2021/923. The bank's risk analysis as at March 1, 2022 identified a total of 105 risk takers.

Design of the remuneration systems at DZ HYP

The remuneration of employees at DZ HYP comprises fixed remuneration and, as a rule, variable remuneration that is partly dependent on the bank's success.

The level of fixed remuneration is determined by the collective pay agreement or by the importance of the employee's role, market conditions, and the employee's personal skills.

The level of variable remuneration fundamentally reflects the employee's personal performance or, depending on the remuneration system, is based solely or partly on the bank's success and sometimes partly on the success of the division in which the employee works.

There is no remuneration in the form of shares or options at DZ HYP. Variable remuneration is not guaranteed.

Severance pay is granted in compliance with the provisions in section 5 (6) InstitutsVergV and DZ HYP's severance pay framework. This framework defines gross monthly salary, period of service, and age as the basic criteria. It allows additional criteria to be applied on a case-by-case basis.

In March 2022, the bank granted variable remuneration in the form of a one-off and voluntary bonus to its employees in order to mitigate the additional burden they faced due to the coronavirus crisis in 2021. The bonus is based on the statutory provision introduced for this purpose in section 3 no. 11a EStG.

Variable remuneration is subject to the requirements of InstitutsVergV concerning major institutions pursuant to section 1 (3c) KWG. In accordance with section 18 (1) sentence 3 InstitutsVergV and article 94 (3) letter b of Directive 2013/36/EU, the variable remuneration of risk takers at DZ HYP that does not exceed €50 thousand and does not constitute more than a third of the risk taker's total annual remuneration is exempt from the special requirements in sections 20 and 22 InstitutsVergV applicable to risk takers, which implement article 94 (1) letters l, m, and o (2) of Directive 2013/36/EU into German law.

The differences and unique features in the design of the remuneration systems for individual employee groups are described below.

Remuneration system for employees in the collectively-negotiated wage sector

The fixed remuneration of employees in the CN wage sector is based on the collective pay agreement for the private banking sector. It comprises 12 monthly salaries and a collectively negotiated bonus in the form of one gross monthly salary (13th monthly salary). On the basis of an overall commitment, all employees in the CN wage sector who are not eligible for a target bonus also receive an annual bonus in the amount of half of one gross monthly salary in December of each year.

In addition to the collectively negotiated remuneration, the employees in the CN wage sector receive variable remuneration based on the 'Principles of variable performance-based remuneration' company agreement, which is applicable with identical content. Under this agreement, employees in the CN wage sector generally receive variable remuneration under a profit-sharing scheme that depends solely on the achievement of entity targets. The profit-sharing scheme is based on the KPIs return on equity (ROE), cost/income ratio (CIR), and risk-weighted assets (RWAs) and amounts to no more than 0.8 x one gross monthly salary in the event that the bank's target achievement exceeds 130 percent. If the bank's target achievement is between 90 percent and 110 percent, the variable remuneration under the profit-sharing scheme amounts to half of one gross monthly salary. If the bank's target achievement is less than 50 percent, the variable profit-sharing scheme is cancelled.

As an alternative under the 'Principles of variable performance-based remuneration' company agreements, employees receive variable remuneration in the form of a target bonus that depends on the achievement of individual and entity targets. The target bonus must not exceed three gross monthly salaries. This form of variable remuneration is usually only available to employees in the NCN wage sector. Please refer to the relevant information on variable remuneration for employees in the NCN wage sector.

Remuneration system for employees in the non-collectively-negotiated wage sector

Employees in the NCN wage sector at the Hamburg office receive twelve monthly salaries. On the basis of an overall commitment, all employees in the NCN wage sector at the Hamburg office who are not eligible for a target bonus additionally receive an annual bonus in the amount of half of one gross monthly salary in December of each year. The employees in the NCN wage sector at the Hamburg office who are eligible for a target bonus also receive an annual bonus in the amount of half of one gross monthly salary on the basis of an individual agreement, which means that all employees in the NCN wage sector at the Hamburg office receive 12.5 monthly salaries as fixed remuneration.

The fixed salary of the employees in the NCN wage sector at the Münster office consists of 12 monthly salaries and, in some cases, a fixed bonus in December amounting to an average of two monthly salaries on the basis of an individual agreement. Since August 2018, new employment contracts with employees in the NCN wage sector at the Münster office have no longer included a fixed bonus.

The 'Principles of variable performance-based remuneration' company agreements for the Hamburg and Münster offices also apply to employees in the NCN wage sector who are not senior managers. The agreements distinguish between those employees who receive a target bonus and those who do not. Managers, employees with quantitative sales targets, and employees who are risk takers but not in the aforementioned groups are eligible for a target bonus. Each year, target agreements are reached with the employees eligible for a target bonus. These agreements set out qualitative and quantitative criteria as well as divisional and individual targets. The level of variable remuneration for employees eligible for a target bonus depends on the individual's performance and target achievement, on the success of his or her division, and the entity's results (measured on the basis of return on equity (ROE), the cost/income ratio (CIR), and risk-weighted assets (RWAs)). The target bonus must not exceed three gross monthly salaries. Employees eligible for a target bonus can receive a maximum of 1.5 x the contractually agreed target bonus or a maximum of around 27 percent of their total annual remuneration as variable remuneration.

The variable remuneration for employees in the NCN wage sector who are not eligible for a target bonus is based on the same rules as the variable remuneration for employees in the CN wage sector who are not eligible for a target bonus; please refer to the relevant information.

The variable remuneration is paid with the April salary in the year following the year to which it applies.

Remuneration system for employees in control units

For employees in control units within the meaning of section 2 (11) InstitutsVergV, employment contract provisions or, where applicable, company agreements governing variable performance-based remuneration ensure that their variable remuneration cannot exceed a third of the total remuneration, thereby placing the emphasis on fixed remuneration (section 9 (2) InstitutsVergV).

There are also safeguards in place to ensure that employees in control units are remunerated independently of the divisions that they oversee (section 5 (4) InstitutsVergV). The company agreements governing variable performance-based remuneration stipulate that, in respect of target agreements for employees in control units who are eligible for a target bonus, there is no overwhelming correlation between their targets and the targets of the organizational units that they oversee and that conflicts of interest must be avoided.

Remuneration system for risk takers below the level of head of division

With regard to the remuneration systems for risk takers who are not members of the Supervisory Board or Board of Managing Directors, a distinction is made between the level of head of division and risk takers below the level of head of division.

The remuneration structure and, in particular, the bonus calculation for all employees below the level of head of division who have been identified as risk takers are governed by the remuneration system for employees in the NCN wage sector who are eligible for a target bonus.

They receive twelve (Hamburg office: twelve and a half) fixed monthly salaries plus variable remuneration that is based on the 'Principles of variable performance-based remuneration' company agreement.

The variable remuneration for risk takers below the level of head of division is set by the Board of Managing Directors on the basis of the relevant head of division's suggestion with reference to a contractually agreed target bonus. The level of the contractually agreed target bonus is limited to a maximum of three gross monthly salaries.

Quantitative and qualitative targets derived from the corporate strategy in the form of overall bank, divisional, and individual targets are used to determine the actual bonus level. Target achievement, and thus the variable remuneration, depends on the entity's success (derived from ROE, CIR, and RWAs; target/actual comparison = success of the bank), on the contribution made by the division, and on the individual target achievement of the risk taker. New divisional and individual targets are agreed upon and set during a target agreement meeting each year between the risk taker and head of division. The variable remuneration to be paid to risk takers eligible for a target bonus equates to a maximum of 1.5 x the contractually agreed target bonus, which means that the variable remuneration may account for a maximum of around 27 percent of their total annual remuneration.

Besides the aforementioned overall bank, divisional, and individual targets, group targets are agreed with any risk takers at DZ HYP who are also group risk takers.

The variable remuneration for a particular year is paid in April of the following year.

If the variable remuneration for a year amounts to or exceeds €50 thousand or a third of the total annual remuneration of a risk taker, the same arrangements as for the heads of divisions apply with regard to deferral, entitlement requirements, and payment requirements.

Remuneration system for the level of head of division

All heads of division are senior managers and have been identified as risk takers. Because they are senior managers, they are not covered by the company agreements governing variable performance-based remuneration. Their remuneration is governed by their employment contracts. The bank has set the following remuneration parameters for measuring the remuneration of heads of division:

They receive fixed remuneration in the form of twelve monthly salaries and variable remuneration that is based on individual contractual arrangements.

The Board of Managing Directors sets the variable remuneration for the heads of division with reference to a contractually agreed target bonus. Quantitative and qualitative targets derived from the corporate strategy in the form of group, overall bank, divisional, and individual targets are assessed during the annual target achievement process and used to determine the actual bonus level.

Target achievement, which is calculated on the basis of ROE, CIR, and RWAs for group and overall bank targets, ranges from 0 percent to 130 percent; it ranges from 0 percent to 150 percent for divisional and individual targets. The group and overall bank targets are set by the Board of Managing Directors and are given a 40 percent weighting; the divisional and individual targets are agreed upon by the responsible member of the Board of Managing Directors and head of division and are given a 60 percent weighting. This means that the variable remuneration may account for a maximum of 142 percent of the target bonus. The amount of variable remuneration of heads of division may not exceed the sum of their fixed gross annual salary.

The variable remuneration for a particular year is paid in April of the following year.

If the variable remuneration exceeds €50 thousand or a third of the total annual remuneration of a head of division, some of it is paid immediately, some is deferred, and some is subject to a retention period:

- 20 percent of the calculated bonus is paid immediately in cash in April of the following year.
- 20 percent of the calculated bonus is subject to a one-year retention period. The amount paid after the retention period has ended depends on the bank’s long-term performance during the retention period.
- 30 percent of the calculated bonus (risk amount) is deferred over a period of five years from the end of the financial year in question. After the end of each of the five years following the financial year in question, one-fifth of the risk amount is paid, provided that there are no negative contributions to profits. A malus event may lead to a reduction or even cancellation of the risk amount.
- 30 percent of the calculated bonus is deferred over a period of five years from the end of the financial year in question and, during an additional one-year retention period, is pegged to the bank’s long-term performance.

The relevant portion of the variable remuneration is vested during the aforementioned retention periods.

Long-term performance is calculated on the basis of the change in the value of the shares in the calendar year in question. If the share price drops by more than 25 percent, the deferred portion of the bonus amounts to zero; if it drops by between 15 percent and 25 percent, the deferred portion of the bonus is 50 percent. If the share price drops by less than 15 percent, the deferred portion of the bonus is 100 percent of the calculated amount.

Negative contributions to profits are taken into account when setting bonuses and calculating pro rata deferral payments. These are determined using a list of criteria in the following categories:

- Personal conduct

- Significant deterioration in the bank's or the DZ BANK Group's financial situation during the deferral period
- Missed targets or conduct that results in sanctions or losses

Negative contributions to profits may cause the variable remuneration to be reduced or cancelled. Variable remuneration can be clawed back in particularly serious cases.

Remuneration system for members of the Board of Managing Directors

The remuneration for members of the Board of Managing Directors is definitively agreed with the Supervisory Board in writing. The members of the Board of Managing Directors receive twelve fixed monthly salaries plus variable remuneration.

The variable remuneration of the members of the Board of Managing Directors depends on the achievement of quantitative and qualitative targets. Target achievement is measured using the average of the past three financial years for the bank or the DZ BANK Group. The targets are derived from the corporate strategy in the form of group, bank, area of board responsibility, and individual targets and are agreed between the Supervisory Board and the members of the Board of Managing Directors.

The remuneration system for the members of the Board of Managing Directors does not run counter to the monitoring function of the member of the Board of Managing Directors responsible for risk management. When agreeing on the targets with the member of the Board of Managing Directors responsible for risk management, the Supervisory Board makes sure that there is no significant correlation between the targets of this member of the Board of Managing Directors and the targets of the organizational units that he or she monitors.

There is no right to a guaranteed minimum bonus. If all agreed targets are achieved in full, the contractually agreed, maximum achievable bonus is set. Target achievement for each individual target ranges from 0 percent (target not achieved) to 150 percent (target exceeded).

Some of the variable remuneration is deferred and subject to a retention period:

- 20 percent of the bonus amount is paid in April of the following year.
- A further 20 percent is subject to a one-year retention period. During the retention period, this bonus installment depends on the bank's long-term performance.
- The remaining 60 percent is deferred for five years and split into five parts. After each year of the five years following the financial year in question, one-fifth of the deferred amount is calculated on the basis of the change in enterprise value and a one-year retention period is applied. These bonus installments are also pegged to the bank's long-term performance during the retention period.

Variable remuneration is not vested during the deferral period or retention period because there is merely an entitlement during these periods to the accurate calculation of each bonus installment. The change in the value of DZ HYP's shares between April 15 and the applicable valuation date (April 14) is used to measure the bank's long-term performance. If the share price drops by more than 25 percent, the deferred portion of the bonus amounts to zero; if it drops by between 15 percent and 25 percent, the deferred portion of the bonus is 50 percent. If the share price drops by less than 15 percent, the deferred portion of the bonus is 100 percent.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferral payments, which may cause the variable remuneration to be reduced or cancelled. The list of criteria used to determine negative contributions to profits comprises a list of types of personal misconduct and factors that resulted in the significant deterioration of DZ HYP's financial situation during the deferral period. Missed targets (individual targets or targets for the area of board responsibility) that are ascertained only subsequently also count as negative contributions to profits.

For a period of two years after the end of their deferral and retention periods, bonus installments already paid can be clawed back, and the entitlement to payment of deferred bonus installments can be cancelled, if the member of the Board of Managing Directors has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution or if the member was in serious breach of relevant external or internal rules regarding suitability and conduct.

Remuneration system for members of the Supervisory Board of DZ HYP

Each Supervisory Board member's remuneration consists of fixed annual remuneration, the level of which varies depending on whether they are a chairperson, deputy chairperson, or member of a committee. The members of the Supervisory Board committees also receive an attendance fee for each committee meeting that they attend. There is no variable remuneration.

15.4.4 Remuneration systems at DVB

General principles

The DVB Group's remuneration system is based on a remuneration strategy ('Remuneration strategy and principles of the DVB Group') that sets out uniform rules for the groupwide management of remuneration and applies in all companies and at all sites. These groupwide rules governing the remuneration strategy, the remuneration systems, and the annual setting of targets ensure that the requirements of InstitutsVergV are met by all subordinated companies. Stricter local requirements do not have to be applied.

In 2022, the following units were defined as control units at DVB: Credit Shipping, Credit Quality Assessment, Group Audit, Group Compliance Office, Group Controlling, Group Risk Management, and Operational Services. In terms of the remuneration in control units, DVB makes sure that employees in the control units are remunerated independently of the employees in the divisions that they oversee by ensuring that their variable remuneration is not determined to a significant extent by the same remuneration parameters. The remuneration for risk takers is based on individual targets, team targets, and bank targets; other employees' variable remuneration is based solely on individual targets. This means that there are targets at bank level that apply both to risk takers in control units and to risk takers in the units overseen by the control units; the targets are different at the other two levels (individual and team), so 2 out of the 3 factors are ultimately independent of each other. Because employees other than risk takers only have individual targets, there is no correlation between the targets of such employees in the control units and those in the units overseen by the control units.

All employees receive a fixed salary, the installments of which vary depending on location and local custom. Employees also have the possibility of a variable payment in the form of an annual performance-based bonus.

In connection with the merger of DVB Bank SE with DZ BANK AG in August 2022, a number of special arrangements for the variable remuneration for 2022 were agreed. For all employees at the Frankfurt office and for all employees outside Germany who left the bank as a result of the merger, targets were agreed only for the period up to the merger. The target achievement of these employees was measured for this period, and the variable remuneration was paid during the year.

Variable remuneration is generally subject to the requirements of InstitutsVergV. In accordance with section 18 (1) sentence 3 InstitutsVergV and article 94 (3) CRD, variable remuneration of risk takers that does not exceed €50 thousand for a financial year and does not constitute more than a third of their total remuneration is exempted from the special requirements in InstitutsVergV.

Remuneration system for employees in the collectively-negotiated wage sector

The remuneration of employees in the CN wage sector in Germany is governed by collective pay agreements for the private banking sector and for public-sector banks in Germany. Fundamentally, the remuneration of these employees comprises 13 fixed monthly salaries (including bonuses pursuant to clause 10 of the collective pay agreement for the private banking sector and the agreements in DVB's company agreement). A discretionary bonus may also be granted depending on the success of the bank's business and the employee's personal performance.

Remuneration system for employees in the non-collectively-negotiated wage sector

Employees covered by this remuneration system receive a fixed salary paid in regular installments plus a contractually agreed performance- and results-based remuneration component (target bonus).

The fixed salary installments vary depending on location and local custom.

The variable remuneration component can be tailored to the individual on the basis of a target bonus agreement. The target bonus is set by the Board of Managing Directors and the HR division.

The proportion of target income (basic salary + target bonus) accounted for by variable remuneration is kept to a level at which the employee does not become financially dependent on it. The fixed component has an even higher weighting in the control units.

In addition to departmental targets for the Credit Asset Solution Group (CASG), the bonus calculation reflects individual performance. Employees' individual targets consist of not only financial metrics but also non-financial factors, such as process-oriented targets, involvement in projects, and conduct. The individual targets can be given different weightings and, like the departmental targets, are documented in writing.

These target levels can vary in terms of weighting. They are currently weighted as follows:

	CASG	All other divisions
Departmental targets	40%	-
Individual targets	60%	100%

The performance factors at departmental level are determined on the basis of management reporting. The individual factor and any qualitative departmental targets are set during the annual performance review with the employee's manager.

Target achievement is calculated independently for each level/for each target. The individual results are aggregated and then multiplied by the target bonus to give the payment amount.

The Board of Managing Directors has a number of options at its disposal for adjusting the formula-based bonus calculation in the event of exceptional circumstances and/or achievements or if achievements have not yet been reflected in the targets:

- Granting of an additional discretionary bonus pool at departmental or team level
- Granting of a discretionary bonus to individual employees
- Adjustments due to personal misconduct

Remuneration system for risk takers (below the level of head of division)

The remuneration system for risk takers is fundamentally the same as the remuneration system for employees in the NCN wage sector.

When the bonus for risk takers is calculated, the entity targets (DVB Group targets) and the departmental targets are taken into consideration.

	All divisions
DVB Group targets	30%
Departmental targets	35%
Individual targets	35%

The performance factors at bank and departmental level are determined on the basis of management reporting. The individual factor and any qualitative departmental targets are set during the annual performance review with the employee's manager.

Target achievement is calculated independently for each level. The individual results are aggregated and then multiplied by the target bonus to give the payment amount.

The Board of Managing Directors has a number of options at its disposal for adjusting the formula-based bonus calculation in the event of exceptional circumstances and/or achievements or if achievements have not yet been reflected in the targets:

- Adjustment of target achievement at group level using a modifier of plus or minus 20 percentage points (prerequisite: unforeseeable events outside the bank's sphere of influence)
- Granting of an additional discretionary bonus pool at departmental or team level
- Granting of a discretionary bonus to individual employees
- Adjustments due to personal misconduct

However, the bonus is paid as follows in accordance with InstitutsVergV:
The risk taker becomes entitled immediately (in the following year) to 40 percent of the achieved bonus, once it has been set by the Board of Managing Directors (immediate bonus). Only 50 percent of this amount is paid immediately; the remaining 50 percent is subject to a one-year retention period, during which it is pegged to the change in the DVB Bank Group's enterprise value.

60 percent of the achieved bonus is deferred (deferred bonus) and allocated in five tranches (each equating to 12 percent) over a period of five years. 50 percent of each tranche is subject to a further retention period of one year and is pegged to the change in the DVB Bank Group's enterprise value during both the deferral period and the retention period.

After each deferral period and after the individual tranche's additional retention period, the risk taker becomes entitled to payment of the particular bonus installment.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferrals.

Each deferred bonus tranche undergoes a malus process before payment, which involves reviewing the relevant risk situation and financial performance, compliance with internal policies (e.g. compliance policies, lending policies), and personal conduct. However, the malus process cannot increase an individual deferred bonus tranche; it can merely reduce or cancel it.

In the event of serious misconduct on the part of an employee, the Board of Managing Directors will initiate a clawback process, leading to the variable remuneration being forfeited in full (not only outstanding installments but also installments already paid).

The DVB Board of Managing Directors is responsible for determining the remuneration system.

Remuneration system for heads of division (below the level of the Board of Managing Directors)

The remuneration system for heads of division is the same as the remuneration system for risk takers below the level of head of division.

Remuneration system for the Board of Managing Directors

In addition to a fixed salary, the remuneration system for the Board of Managing Directors includes a variable remuneration component (bonus). The variable remuneration of the Board of Managing Directors is set with reference to a maximum achievable bonus. Quantitative and qualitative targets derived from the corporate strategy and strategic planning are used to determine the bonus. Targets are set at group, bank, divisional, and individual level and are all measured over a period of several years. The maximum bonus is set in the event of full achievement of each individual target.

The member of the Board of Managing Directors becomes entitled immediately (in the following year) to 40 percent of the achieved bonus, once it has been set by the Supervisory Board (immediate bonus). Only 50 percent of this amount is paid immediately; the remaining 50 percent is subject to a one-year retention period, during which it is pegged to the change in the DVB Bank Group's enterprise value.

60 percent of the achieved bonus is deferred (deferred bonus) and allocated in five tranches (each equating to 12 percent) over a period of five years. After the deferral period, 50 percent of each tranche is subject to a further retention period of one year and is pegged to the change in the DVB Bank Group's enterprise value during both the deferral period and the retention period.

After each deferral period and after the individual tranche's additional retention period, the member of the Board of Managing Directors becomes entitled to payment of the particular bonus installment.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferrals, which may cause the variable remuneration to be reduced or cancelled. Variable remuneration is not vested during the deferral period.

Each deferred bonus tranche undergoes a malus process before payment, which involves reviewing the relevant risk situation and financial performance, compliance with internal policies (e.g. compliance policies, lending policies), and personal conduct. However, the malus process cannot increase an individual deferred bonus tranche; it can merely reduce or cancel it. For a period of two years after the end of its deferral period, a bonus installment already paid can be clawed back, and the entitlement to bonus payments can be cancelled, if the member of the Board of Managing Directors has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution or if the member was in serious breach of relevant external or internal rules regarding suitability and conduct.

The full DVB Supervisory Board is responsible for determining the remuneration system for the members of the Board of Managing Directors. Since 2014, the appropriateness of the remuneration systems has been ensured, primarily by the Remuneration Control Committee of the Supervisory Board.

15.4.5 Remuneration systems at DZ PRIVATBANK

At DZ PRIVATBANK, the remuneration of employees in the CN wage sector is governed by the prevailing collective pay agreement. There is also a remuneration system for employees in the NCN wage sector and a remuneration system for risk takers. The Supervisory Board of DZ PRIVATBANK decides on the remuneration of the members of the Board of Managing Directors of DZ PRIVATBANK on the basis of individual contractual arrangements.

The remuneration systems generally apply at all locations while taking country-specific aspects into consideration, for example national legislation and provisions in a collective pay agreement. All offices in Luxembourg and abroad are included in a points system that is based on a systematic assessment of the importance of a role; remuneration is paid in accordance with this system. All aspects of the remuneration systems at DZ PRIVATBANK are designed to be gender-neutral.

There is a collective pay agreement for employees in the financial sector in Luxembourg. Employees in the CN wage sector receive a 13th monthly salary payment at the end of the year and a loyalty bonus linked to their length of service at the bank that is paid in June. It ranges from 20 percent to 85 percent of the basic monthly salary and is capped at a maximum amount.

In the context of corporate health management, DZ PRIVATBANK offers its employees non-cash benefits that are designed to promote staff loyalty. These include extensive services run by the health management team, such as free flu vaccinations, an exercise room, and sports activities.

Certain groups of employees receive an allowance on top of their fixed remuneration that is linked to their role. The allowance stops if the employee changes role or moves to a different organizational unit. As a rule, allowances are not pensionable and the amounts are static. Allowances are not based on a statutory obligation but are granted on a voluntary basis.

None of DZ PRIVATBANK's shares are traded on the market.

DZ PRIVATBANK is required to comply with the requirements in local legislation, the regulatory requirements applicable at its sites, and the German InstitutsVergV. Although InstitutsVergV does not apply directly to banks headquartered in Luxembourg, section 27 requires the management body of the parent company (DZ BANK, Frankfurt) to ensure compliance with the requirements of InstitutsVergV in subordinated entities and thus in group companies outside Germany, provided that this does not conflict with any company-law provisions or national rules.

DZ PRIVATBANK is therefore subject to the uniform rules for the management of remuneration derived from the DZ BANK Group's remuneration strategy and submits the related documentation about its compliance with the agreed principles to DZ BANK for review. As a result of this procedure, DZ PRIVATBANK applies the strictest remuneration rules at the location.

Remuneration system for employees in the non-collectively-negotiated wage sector

The Board of Managing Directors is responsible for determining the remuneration system for employees in the NCN wage sector. In accordance with the provisions of InstitutsVergV, the remuneration system for employees in the NCN wage sector includes a ban on hedging, rules on the 1:1 ratio of fixed to variable remuneration, an explicit ban on guaranteed bonuses (except in the first year of employment, provided that the employee did not transfer from another entity in the DZ BANK Group), and specific rules on remuneration arrangements for employees in control units.

The remuneration system for employees in the NCN wage sector includes not only a fixed monthly salary (12 or 12.5 salary payments in Luxembourg, 12.5 in Germany, and 13 in Switzerland) but also a performance- and results-based remuneration component (reference bonus).

System of responsibility levels

Each role at DZ PRIVATBANK that is not covered by a CN pay agreement is rated according to knowledge/ability, problem-solving, responsibility, and strategic importance and then assigned to one of four responsibility levels. The percentage share represented by the reference bonus and the lower and upper limits for the employee's remuneration depend on the responsibility level to which his or her role is assigned. This share ranges from 5 percent to a maximum of 40 percent of the annual fixed salary. The remuneration of employees in control units is more oriented toward annual fixed salary. Their possible reference bonus therefore ranges from 5 percent to a maximum of 20 percent of the annual fixed salary. The total variable remuneration of employees in control departments must not exceed a third of their total annual remuneration.

Calculation of the variable component

The following formula is used to calculate the variable component as part of the annual bonus process:

Bonus = (reference bonus x individual performance factor x segment factor x location factor)

When calculating the bonus, the aim is to both recognize employees' high level of dedication and enable them to actively share in the success of their segment and of DZ PRIVATBANK as a company. That is why the bonus is determined using further performance factors in addition to the segment and overall bank targets. The level of these factors is as follows:

- Individual performance factor: 0.5 to 1.8
- Segment factor: 0.8 to 1.2
- Location factor: 0.8 to 1.2

The Board of Managing Directors sets the segment factors and the location factor. The bank can set an individual performance factor and the location factor in a particular country (so that it differs from the location factor in other countries) at zero, if required under local regulatory and statutory provisions. This ensures that it is possible to cancel an employee's bonus. The segment factors for the variable remuneration of employees in control units are not based on the same remuneration parameters as for the employees in the segments overseen by the control units.

Remuneration system for risk takers (maximum bonus scheme)

The Board of Managing Directors is responsible for determining the remuneration system for risk takers. The remuneration system for risk takers is fundamentally derived from the remuneration system for employees in the NCN wage sector.

The remuneration system for risk takers also includes a ban on hedging, rules on the 1:1 ratio of fixed to variable remuneration, an explicit ban on guaranteed bonuses (except in the first year of employment, provided that the employee did not transfer from another entity in the DZ BANK Group), and specific rules on remuneration arrangements for employees in control units.

As is the case in the remuneration system for all employees in the NCN wage sector, risk takers are assigned to salary brackets. Based on categorization in accordance with Delegated Regulation (EU) 2021/923, they are generally assigned to responsibility levels 1 and 2. In the remuneration system for risk takers, variable remuneration is designed as a maximum bonus scheme. The target agreement system includes quantitative and qualitative targets. The quantitative targets are derived from the operational planning of DZ PRIVATBANK and of the relevant segment. There are also additional individual quantitative and qualitative targets.

60 percent of the targets are measured over a period of three years; the other targets are measured over a one-year period. Because the maximum bonus scheme is based on aggregation, target achievement for the individual targets ranges from 0 percent to 180 percent, whereas overall target achievement is limited to 100 percent of the maximum bonus. If target achievement for a particular target is below 50 percent, the share of the bonus for this target is zero percent.

Deferral and retention rules have also been established for risk takers whose bonus exceeds €50 thousand. If the variable remuneration exceeds this threshold, 20 percent of the bonus achieved is paid immediately in the following year. Payment of the remaining 80 percent of the bonus set for the previous year is spread out over a period of at least five years, taking into account deferral and retention periods for risk takers below the level of head of segment. For employees at the level of the Board of Managing Directors at subsidiaries of DZ PRIVATBANK and for managers below the Board of Managing Directors at DZ PRIVATBANK (heads of segment, risk takers required to report directly to the Board of Managing Directors, and defined high earners) whose bonus exceeds the threshold of €50 thousand, the deferral period is at least six years (including retention periods). The deferred bonus is split into four or five pro rata deferrals (each amounting to a quarter or a fifth of the 60 percent). All amounts earmarked for deferred payment are linked to the long-term performance of DZ PRIVATBANK because they are pegged to the value of its shares.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferrals, which may cause the variable remuneration to be reduced, cancelled, or clawed back in a period lasting no more than two years after payment of the final deferred installment. Variable remuneration is not considered to be vested during the deferral and retention periods.

Remuneration system of the Board of Managing Directors

The Supervisory Board of DZ PRIVATBANK is responsible for determining the remuneration system for the members of the Board of Managing Directors. The remuneration of the Board of Managing Directors is set on the basis of individual contractual arrangements. As well as a pensionable fixed salary, the remuneration includes a bonus and contributions to an occupational pension.

Depending on target achievement, the bonus for the Board of Managing Directors of DZ PRIVATBANK ranges from 0 percent to a maximum of 150 percent of the reference bonus. Quantitative and qualitative targets derived from the corporate strategy in the form of group, bank, area of board responsibility, and individual targets are used to determine the bonus level. All targets for the Board of Managing Directors have a historical multi-year measurement period of three years.

Only 20 percent of the bonus achieved is paid immediately in the following year after the annual financial statements have been adopted and the bonus has been set by the Supervisory Board. Another 20 percent is subject to a retention period of one calendar year and depends on the long-term changes in the enterprise value of DZ PRIVATBANK. 60 percent of the bonus set by the Supervisory Board for the previous financial year is deferred over a period of five calendar years. To this end, the deferred bonus is divided into five equal installments. They are paid after taking into account deferral and retention periods. All amounts earmarked for deferred payment are linked to the long-term performance of DZ PRIVATBANK because they are pegged to its enterprise value.

Negative contributions to profits are taken into account when setting bonuses and pro rata deferrals by means of backtesting, which may cause the variable remuneration to be reduced or cancelled. Variable remuneration is not considered to be vested during the deferral and retention periods. For a period of two years after the end of its deferral period, a bonus installment already paid can be clawed back, and the entitlement to bonus payments can be cancelled, if the member of the Board of Managing Directors has played a significant part in, or was responsible for, conduct that led to substantial losses or material regulatory sanctions for the institution or if the member was in serious breach of relevant external or internal rules regarding suitability and conduct.

Remuneration for supervisory bodies

The Annual General Meetings of the individual companies decide on the remuneration of the members of the supervisory bodies at DZ PRIVATBANK. This remuneration comprises fixed annual remuneration and, depending on the size and location of the company, a meeting attendance fee. There is no variable remuneration.

16 Confirmation from the Board of Managing Directors pursuant to article 431 (3) CRR

By signing off this disclosure report, the Board of Managing Directors confirms that the report was prepared in accordance with the formal procedures and internal processes, systems, and controls defined by the DZ BANK banking group. The most important elements are presented in section 1 'Basis of regulatory risk reporting'.

17 Annexes

(Article 442 sentence 1 letters c and e CRR)

Annex 1: EU CQ4 (list of other countries)

List of other countries

1	Egypt	72	Cuba
2	Algeria	73	Kuwait
3	US Virgin Islands	74	Latvia
4	Andorra	75	Lebanon
5	Angola	76	Liberia
6	Anguilla	77	Liechtenstein
7	Antigua and Barbuda	78	Lithuania
8	Arab Emirates, United	79	Malawi
9	Argentina	80	Malaysia
10	Armenia	81	Mali
11	Aruba	82	Malta
12	Azerbaijan	83	Morocco
13	Australia	84	Marshall Islands
14	Bahamas	85	Mauritius
15	Bahrain	86	Mexico
16	Bangladesh	87	Mongolia
17	Belarus	88	Montenegro
18	Belgium	89	Montserrat
19	Bermuda	90	Namibia
20	Bolivia, Plurinational State of	91	New Zealand
21	Bonaire, Sint Eustatius, and Saba	92	Nigeria
22	Bosnia and Herzegovina	93	Norway
23	Botswana	94	Oman
24	Brazil	95	Pakistan
25	British Virgin Islands	96	Palestinian territories
26	Bulgaria	97	Panama (incl. former Canal Zone)
27	Burkina Faso	98	Paraguay
28	Chile	99	Peru
29	China	100	Philippines
30	Costa Rica	101	Poland
31	Curaçao	102	Portugal
32	Denmark	103	Rwanda
33	Dominica	104	Romania
34	Dominican Republic	105	Russian Federation
35	Ecuador	106	Saudi Arabia
36	Côte d'Ivoire	107	Sweden
37	Estonia	108	Senegal
38	Falkland Islands	109	Serbia
39	Finland	110	Zimbabwe
40	Georgia	111	Singapore
41	Ghana	112	Sint Maarten (Dutch part)
42	Grenada	113	Slovakia
43	Greece	114	Slovenia
44	Guatemala	115	Spain
45	Guernsey	116	Saint Kitts and Nevis
46	Guinea	117	Saint Lucia
47	Guyana	118	Saint Vincent and the Grenadines
48	Haiti	119	South Africa
49	Hong Kong	120	Sudan
50	India	121	Suriname

List of other countries

51	Indonesia	122	Syrian Arab Republic
52	Isle of Man	123	Taiwan
53	Iraq	124	Tanzania, United Republic of
54	Iran, Islamic Republic of	125	Thailand
55	Ireland	126	Timor-Leste
56	Iceland	127	Togo
57	Israel	128	Trinidad and Tobago
58	Italy	129	Czech Republic
59	Jamaica	130	Tunisia
60	Japan	131	Turkey
61	Jersey	132	Turkmenistan
62	Cayman Islands	133	Turks and Caicos Islands
63	Cameroon	134	Tuvalu
64	Canada	135	Ukraine
65	Kazakhstan	136	Hungary
66	Qatar	137	Uruguay
67	Kenya	138	Uzbekistan
68	Colombia	139	Venezuela, Bolivarian Republic of
69	Congo, Democratic Republic of the	140	Vietnam
70	Korea, Republic of (formerly South Korea)	141	Cyprus
71	Croatia		

Annex 2: List of NACE sectors to be considered for template 3 in section 14

IEA sector	Column b – NACE sectors (minimum selection) – sectors required		** Parameter examples – list is not exhaustive; institutions apply the parameters defined in the IEA scenario
Sector in the template	Sector	Code	
Maritime transport	Shipping	301	Average tonnes of CO_2 per passenger-km Average gCO_2/MJ and average share of high carbon technologies (ICE)
Maritime transport	Shipping	3011	
Maritime transport	Shipping	3012	
Maritime transport	Shipping	3315	
Maritime transport	Shipping	50	
Maritime transport	Shipping	501	
Maritime transport	Shipping	5010	
Maritime transport	Shipping	502	
Maritime transport	Shipping	5020	
Maritime transport	Shipping	5222	
Maritime transport	Shipping	5224	
Maritime transport	Shipping	5229	
Power	Power	27	Average tonnes of CO_2 per MWh and average share of high carbon technologies (oil, gas, coal)
Power	Power	2712	
Power	Power	3314	
Power	Power	35	
Power	Power	351	
Power	Power	3511	
Power	Power	3512	
Power	Power	3513	
Power	Power	3514	
Power	Power	4321	
Fossil fuel combustion	Oil and gas	91	Average tonnes of CO_2 per GJ and average share of high carbon technologies (ICE)
Fossil fuel combustion	Oil and gas	910	
Fossil fuel combustion	Oil and gas	192	
Fossil fuel combustion	Oil and gas	1920	
Fossil fuel combustion	Oil and gas	2014	
Fossil fuel combustion	Oil and gas	352	
Fossil fuel combustion	Oil and gas	3521	
Fossil fuel combustion	Oil and gas	3522	
Fossil fuel combustion	Oil and gas	3523	
Fossil fuel combustion	Oil and gas	4612	
Fossil fuel combustion	Oil and gas	4671	
Fossil fuel combustion	Oil and gas	6	
Fossil fuel combustion	Oil and gas	61	
Fossil fuel combustion	Oil and gas	610	
Fossil fuel combustion	Oil and gas	62	
Fossil fuel combustion	Oil and gas	620	

IEA sector	Column b – NACE sectors (minimum selection) – sectors required		** Parameter examples – list is not exhaustive; institutions apply the parameters defined in the IEA scenario
Sector in the template	Sector	Code	
Iron and steel, coke, and metal ore production	Steel	24	Average tonnes of CO_2 per tonne of output and average share of high carbon technologies (ICE)
Iron and steel, coke, and metal ore production	Steel	241	
Iron and steel, coke, and metal ore production	Steel	2410	
Iron and steel, coke, and metal ore production	Steel	242	
Iron and steel, coke, and metal ore production	Steel	2420	
Iron and steel, coke, and metal ore production	Steel	2434	
Iron and steel, coke, and metal ore production	Steel	244	
Iron and steel, coke, and metal ore production	Steel	2442	
Iron and steel, coke, and metal ore production	Steel	2444	
Iron and steel, coke, and metal ore production	Steel	2445	
Iron and steel, coke, and metal ore production	Steel	245	
Iron and steel, coke, and metal ore production	Steel	2451	
Iron and steel, coke, and metal ore production	Steel	2452	
Iron and steel, coke, and metal ore production	Steel	25	
Iron and steel, coke, and metal ore production	Steel	251	
Iron and steel, coke, and metal ore production	Steel	2511	
Iron and steel, coke, and metal ore production	Steel	4672	
Iron and steel, coke, and metal ore production	Coal	5	
Iron and steel, coke, and metal ore production	Coal	51	
Iron and steel, coke, and metal ore production	Coal	510	
Iron and steel, coke, and metal ore production	Coal	52	
Iron and steel, coke, and metal ore production	Coal	520	
Iron and steel, coke, and metal ore production	Steel	7	
Iron and steel, coke, and metal ore production	Steel	72	
Iron and steel, coke, and metal ore production	Steel	729	
Fossil fuel combustion	Coal	8	Average tonnes of CO_2 per GJ and average share of high carbon technologies
Fossil fuel combustion	Coal	9	
Cement, clinker, and lime production	Cement	235	Average tonnes of CO_2 per tonne of output and average share of high carbon technologies (ICE)
Cement, clinker, and lime production	Cement	2351	
Cement, clinker, and lime production	Cement	2352	
Cement, clinker, and lime production	Cement	236	
Cement, clinker, and lime production	Cement	2361	
Cement, clinker, and lime production	Cement	2363	
Cement, clinker, and lime production	Cement	2364	
Cement, clinker, and lime production	Cement	811	
Cement, clinker, and lime production	Cement	89	
Aviation	Aviation	3030	Average share of sustainable aviation fuels and average tonnes of CO_2 per passenger-km
Aviation	Aviation	3316	
Aviation	Aviation	511	
Aviation	Aviation	5110	
Aviation	Aviation	512	
Aviation	Aviation	5121	
Aviation	Aviation	5223	
Automotive	Automotive	2815	Average tonnes of CO_2 per passenger-km and average share of high carbon technologies (ICE)
Automotive	Automotive	29	
Automotive	Automotive	291	
Automotive	Automotive	2910	
Automotive	Automotive	292	
Automotive	Automotive	2920	
Automotive	Automotive	293	
Automotive	Automotive	2932	

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