



Pillar 3 Report 2018

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Regulatory framework

Introduction

This Report provides Pillar 3 disclosures on the consolidated level of Deutsche Bank Group as required by the global regulatory framework for capital and liquidity, established by the Basel Committee on Banking Supervision, also known as Basel 3. On European level these are implemented in the disclosure requirements as laid down in Part Eight of the "Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms" (Capital Requirements Regulation, or "CRR") and the "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 4, or "CRD 4"). Germany implemented these CRD 4 requirements into national law in Section 26a of the German Banking Act ("Kreditwesengesetz" or "KWG"). Further disclosure guidance has been provided by the European Banking Authority ("EBA") in its "Final Report on the Guidelines on Disclosure Requirements under Part Eight of Regulation (EU) No 575/2013" ("EBA Guideline", EBA/GL/2016/11, version 2*). We also provide for the first time Templates 1, 3 and 4 of the EBA Guidelines on disclosure of non-performing and forborne exposures (EBA/GL/2018/10) published on December 17, 2018. Per regulation it is not required to have Pillar 3 disclosures audited. As such the information provided in this Pillar 3 Report is unaudited.

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

Basel 3 and CRR/CRD 4

In the European Union, the Basel 3 capital framework was implemented by the CRR and CRD 4. As a single rulebook the CRR is directly applicable to credit institutions and investment firms in the European Union and provides the grounds for the determination of regulatory own funds, regulatory capital requirements, leverage and liquidity as well as other relevant regulations. In addition, the CRD 4 was implemented into German law by means of further amendments to the KWG and the German Solvency Regulation (SolvV) and accompanying regulations. Jointly, these laws and regulations represent the new regulatory framework applicable in Germany.

The regulatory framework became effective on January 1, 2014, subject to transitional rules. When referring to Deutsche Bank results according to transitional rules we use the term "CRR/CRD 4". When referring to results according to full application of the final CRR/CRD 4 framework (without consideration of applicable transitional methodology) we use the term "CRR/CRD 4 fully loaded". For the calculation of risk-weighted assets (RWA) CRR/CRD 4 maintained transitional rules that permitted the grandfathering of equity investments at a risk-weight of 100 %. These transitional arrangements have been considered lastly for December 31, 2017 and expired thereafter, resulting in no difference thereafter for RWA under the fully loaded or transitional regime.

Since 2015 the Common Equity Tier 1 (CET 1) minimum capital requirement applicable to the Group is 4.5 % of risk-weighted assets. In addition to this minimum capital requirement, various capital buffer requirements were phased in starting 2016 and will become fully effective from 2019 onwards. The development and maintenance of a high quality capital base which should primarily consist of Common Equity Tier 1 reflects one of the core elements of the CRR/CRD 4 framework. Specific regulatory adjustments were subject to transitional rules. For instance, deductions for deferred tax assets that rely on future profitability or deductions for indirect and synthetic holdings of own instruments and capital instruments issued by financial sector entities were phased in. These phase-in arrangements to the CET 1 were still applicable for December 31, 2017 reporting as the phase-in percentage was at 80 % in 2017. They are not applicable from January 1, 2018 onwards as the phase-in percentage increased to 100 %. At the same time minority interest only recognizable under the transitional rules is now phased out with a 100 % phase-out rate since January 1, 2018.

Transitional arrangements are still applicable for Additional Tier 1 (AT1) and Tier 2 (T2) capital. Capital instruments that no longer qualify as AT1 or T2 capital under the CRR/CRD 4 fully loaded rules are subject to grandfathering rules during the transitional period and are being phased out from 2013 to 2022 with their recognition capped at 50 % in 2017, 40 % in 2018 and the cap decreasing by ten percentage points every year thereafter.

Additionally, the leverage ratio has been introduced as a non-risk based capital requirement to complement the risk-based capital requirements. The CRR/CRD 4 requires banks to calculate and disclose a regulatory leverage ratio that is generally based on the accounting value as the relevant exposure measure for assets. Specific regulatory exposure measures apply to derivatives and securities financing transactions as well as off-balance sheet exposures and must be added to determine the total leverage exposure.

The CRR/CRD 4 framework further introduced new liquidity standards. The Liquidity Coverage Ratio (LCR) aims to measure a bank's short-term resilience to a severe liquidity stress scenario during a stress period of 30 calendar days. Detailed rules for the calculation of the LCR are set out in the Commission Delegated Regulation 2015/61 adopted in October 2014. The LCR became a binding minimum requirement as of October 1, 2015 and is phased in progressively: the phase-in percentage now reached 100 % in 2018 and was 80 % in 2017.

The Net Stable Funding Ratio (NSFR) requires banks to maintain a stable funding profile in relation to their on- and off-balance sheet exposures. Within the European Trilogue a revision of the Capital Requirement Regulation ("CRR") is proposed to implement the NSFR into EU legislation. A binding minimum ratio for the NSFR is expected but its date of application has not been finally defined.

There are still some interpretation uncertainties with regard to CRR/CRD 4 rules and some of the related binding Technical Standards are not yet available in their final version. Thus, we will continue to refine our assumptions and models in line with evolution of our as well as the industry's understanding and interpretation of the rules. Against this background, current CRR/CRD 4 measures may not be comparable to previous expectations. Also, our CRR/CRD 4 measures may not be comparable with similarly labeled measures used by our competitors as our competitors' assumptions and estimates regarding such implementation may differ from ours.

ICAAP, ILAAP and SREP

The Internal Capital Adequacy Assessment Process ("ICAAP") as stipulated in Pillar 2 of Basel 3 requires banks to identify and assess risks, maintain sufficient capital to face these risks and apply appropriate risk management techniques to maintain adequate capitalization. Our internal liquidity adequacy assessment process ("ILAAP") aims to ensure that sufficient levels of liquidity are maintained on an ongoing basis by identifying the key liquidity and funding risks to which the Group is exposed, by monitoring and measuring these risks, and by maintaining tools and resources to manage and mitigate these risks.

In accordance with Article 97 of CRD4 supervisors regularly review, as part of the Supervisory Review and Evaluation Process ("SREP"), the arrangements, strategies, processes and mechanisms implemented by banks and evaluate: (a) risks to which the institution is or might be exposed; (b) risks the institution poses to the financial system; and (c) risks revealed by stress testing.

FSB TLAC and European MREL (SRMR/BRRD)

Banks in the European Union are required to meet at all times a minimum requirement for own funds and eligible liabilities ("MREL") which ensures that banks have sufficient loss absorbing capacity in resolution to avoid recourse to taxpayers' money. Relevant laws are the Single Resolution Mechanism Regulation ("SRMR") and the Bank Recovery and Resolution Directive ("BRRD") as implemented through the German Recovery and Resolution Act (Sanierungs- und Abwicklungsgesetz, "SAG").

Instruments which qualify for MREL are own funds (Common Equity Tier 1, Additional Tier 1 and Tier 2) as well as certain eligible liabilities (mainly plain-vanilla unsecured bonds). MREL is expressed as a percentage of Total Liabilities and Own Funds ("TLOF").

MREL is determined on a case-by-case basis by the resolution authority in line with guidance provided by Commission Delegated Regulation (EU) 2016/1450. The Single Resolution Board ("SRB") as Deutsche Bank's resolution authority has issued further MREL policies clarifying how the SRB will exercise its discretion under the above European laws in setting MREL and in determining eligible liabilities.

Within the European Trilogue a revision of the SRMR and the BRRD are proposed as well as amendments to the CRR. These amendments will implement the Total Loss Absorbing Capacity ("TLAC") standard in Europe for Global Systemically Important Institutions (G-SIIs) as internationally agreed in the Financial Stability Board ("FSB") and will make further adjustments to MREL.

General requirements for disclosures

Article 431 (1) CRR - Pillar 3 disclosure concept

We provide our Pillar 3 disclosures in line with the disclosure requirements as laid down in Part Eight of the “Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms” (CRR). This report provides the respective Pillar 3 disclosures to the extent that these Pillar 3 disclosures are not included in the Deutsche Bank Annual Report 2018. Where Pillar 3 disclosure elements are located in the Annual Report of Deutsche Bank, they are generally referenced from the Pillar 3 Report to the Annual Report accordingly. Further down in this Report we provide an overview of the references into the Deutsche Bank Annual Report 2018.

In December 2016 the European Banking Authority (“EBA”) provided a “Final Report on the Guidelines on Disclosure Requirements under Part Eight of Regulation (EU) No 575/2013” (“EBA Guideline”, EBA/GL/2016/11, version 2*), subsequently to the Basel Committee on Banking Supervision releasing a revised version of the Basel 3 Pillar 3 framework. The EBA Guideline constitutes an own-initiative guideline to ensure the harmonized and timely implementation of the new Basel framework in the European Union. In this regard, these Guidelines do not supersede or change the substance of the regulatory disclosures regarding the requirements defined in Part Eight of the CRR. However, they provide guidance on these disclosures from a presentational aspect, in particular by introducing more specific guidance and formats through the use of tables and templates. This means that certain Pillar 3 disclosures follow a fixed format defined by EBA, including column or row labeling, whereas other disclosures are flexible and may be modified to a certain degree to present the most relevant information.

Against this background, we organized the content flow of the Pillar 3 Report to allow for an easy identification of the respective disclosure elements against its specific Pillar 3 disclosure requirements. Within the broad risk sections “credit risk”, “counterparty credit risk”, “market risk”, “operational risk”, “liquidity risk” and “remuneration” we designed the Pillar 3 Report to follow in principle the order of the CRR-Articles in Part Eight (relevant numberings are reflected in the headings of the sections). In some instances within these sections we follow the structure as provided by the EBA Guideline where it helps to present specific topics even more comprehensively at one place. The quantitative Pillar 3 requirements are presented under the relevant EBA template with respective references (e.g., EU OV1, EU CR6), also including the EBA column or row labeling. In instances where additional lines or columns have been added to certain templates for better disclosure presentation a new numbering was introduced as specified in the EBA Guideline. Please note that we still use mainly our own naming conventions within the EBA templates for the description of rows and columns which allows us to stay aligned and consistent in our disclosure presentation over time. We principally make use of the transitional arrangements provided in the EBA Guideline in section 4.1, No. 20 in relation to comparative information for prior periods, where these can be omitted in case of a first year of adoption of a disclosure element.

In 2012 the Enhanced Disclosure Task Force (“EDTF”) was established as a private sector initiative under the auspice of the Financial Stability Board, with the primary objective to develop fundamental principles for enhanced risk disclosures and to recommend improvements to existing risk disclosures. As a member of the EDTF we adhered to the disclosure recommendations in this Pillar 3 Report to the extent applicable.

Article 431 (2) CRR - Information on operational risk methodologies

Deutsche Bank uses the Advanced Measurement Approach (AMA) to measure Operational Risk as outlined in section “Article 446 CRR - Operational risk measurement” in this report on page 149.

Article 431 (3) CRR - Disclosure policy

For purposes of Article 431 CRR, we have adopted a formal Risk Disclosure Policy to ensure that our risk disclosures are in compliance with applicable legal, regulatory and accounting risk disclosure standards and are compiled based upon a set of internally defined principles and related processes. The Risk Disclosure Policy defines overall roles and responsibilities, sets up the disclosure production process and establishes the verification and sign off procedures. Principally senior representatives and subject matter experts from Finance and Risk assume responsibility for our risk disclosures and govern our respective risk disclosure processes. Based upon our assessment and verification we believe that our risk disclosures

presented throughout this Pillar 3 Report in conjunction with the Annual Report 2018 appropriately and comprehensively convey our overall risk profile.

Article 431 (4) CRR - Explanation of rating decisions

Deutsche Bank Group provides explanations of rating decisions to small and medium entities and other corporates whose loan applications were declined.

Article 432 CRR - Non-material, proprietary or confidential information

In line with the Group's internal Risk Disclosure Policy a dedicated process has to be followed in case the Group considers to omit certain disclosures due to these disclosures being immaterial, proprietary or confidential. In the rare cases where the Group classifies information as non-material in this report this has been stated accordingly in the related disclosures.

Article 433 CRR - Frequency of disclosure

In line with the internal Risk Disclosure Policy the Group regularly assesses the need to disclose some or all information required by Titles II and III in Part Eight of Regulation (EU) No 575/2013 more frequently than annually. In accordance with Article 433 CRR the Group bases its assessment mainly on the relevant characteristics of its business such as scale of operations, range of activities, presence in different countries, involvement in different financial sectors, activity in international financial markets and considers participation in payment, settlement and clearing systems. In this regard, special attention is paid to information on capital, capital requirements, risk and other elements that can change rapidly and therefore lead to a more frequent disclosure need.

There is a formal process set up for the identification of the need for higher than annual frequency of all Pillar 3 disclosures which is compatible with the size, the scope and the range of activities of the Group. It also considers external factors like market developments or investors and analysts' expectations as well as internal aspects like expert judgments from areas effected, process of disclosure implementation and quality assurance in the production process with the overall aim to deliver appropriate disclosures which provide a timely, complete and accurate view of the Group's risk profile and risk position.

Subsequently the Group concludes, which parts of the information required under Part 8 CRR are to be disclosed more frequently than once a year. In this regard the Group principally follows the recommendations regarding frequency of disclosures as prejudiced in the CRR and the EBA Guidelines on disclosure requirements under Part Eight of Regulation (EU) No 575/2013 as of December 14, 2016, for those items specified in there, but also reaches respective conclusions for all remaining disclosure items.

The internal Risk Disclosure Policy also states that Pillar 3 disclosures have to be published principally in conjunction with the date of publication of the financial statements unless specified and agreed differently e.g. publication of standalone Pillar 3 Report for significant subsidiaries according to Article 13 CRR.

Article 434 CRR - Means of disclosure

The Pillar 3 Report is provided on the bank's website at db.com/ir/en/regulatory-reporting.htm

The Pillar 3 Report has been organized to principally follow the structure as defined by the EBA guideline ("Final Report on the Guidelines on Disclosure Requirements under Part Eight of Regulation (EU) No 575/2013" EBA/GL/2016/11, version 2*, from 14 December 2016) and underlying Capital Requirement Regulation (CRR) related articles.

This report provides the Basel III Pillar 3 disclosures to the extent that these required Pillar 3 disclosures are not included in the Deutsche Bank Annual Report 2018. Where Pillar 3 disclosure elements are located in the Annual Report of Deutsche Bank, they are generally referenced from the Pillar 3 Report to the Annual Report accordingly. The following table provides an overview of the references into the Deutsche Bank Annual Report 2018.

Main Pillar 3 disclosures in our Annual Report

| Pillar 3 disclosure topic with reference to CRR-Article | Primary location in our Annual Report |
|--|---|
| Risk management objectives and policies (Article 435) | Report of the supervisory board, Our business strategy, Deutsche Bank Group, Risks and opportunities Key risk metrics, Overall risk assessment, Risk profile, Risk and capital framework, Risk management principles, Risk governance, Risk appetite and capacity, Strategic and capital plan, Risk reporting and measurement systems, Capital management, Resource limit setting, Risk identification and assessment, Credit risk management, Market risk management, Operational risk management, Liquidity risk management, Business (strategic) risk management, Model risk management, Reputational risk management, Risk concentration & diversification, Capital, Leverage Ratio and MREL, Credit risk exposure, Asset quality, Trading market risk exposures, Nontrading market risk exposures, Operational risk exposure, Liquidity risk exposure Responsibility statement by the management board, Management board, Supervisory board, Compliance with the German corporate governance code, Targets for the proportion of women in management positions/gender quota, Diversity concept |
| Scope of application of the regulatory framework (Article 436) | Introduction, Shareholdings |
| Own funds (Article 437) | Regulatory capital, Capital instruments, Minimum capital requirements and additional capital buffers, Development of regulatory capital |
| Capital requirements (Article 438) | Key risk metrics, Risk profile, Risk appetite and capacity, Risk and capital plan, Stress testing, Risk identification and assessment, Capital, Leverage Ratio and MREL |
| Counterparty credit risk (Article 439) | Credit risk management, Credit risk exposure, Asset quality, Liquidity risk exposure |
| Capital buffers (Article 440) | Capital, Leverage Ratio and MREL |
| Indicators of global systemic importance (Article 441) | Disclosed on our webpage |
| Credit risk (Article 442) | Asset quality, Note 1 - Significant accounting policies and critical accounting estimates, Note 13 - Financial instruments carried at fair value, Note 14 - Fair value of financial instruments not carried at fair value, Note 21 - Allowance for credit losses |
| Unencumbered assets (Article 443) | Liquidity risk exposure, Note 22 - Transfer of financial assets, assets pledged and received as collateral, Note 39 - Information on subsidiaries |
| Exposure to market risk (Article 445) | Capital, Leverage Ratio and MREL, Trading market risk exposures |
| Operational risk (Article 446) | Operational Risk Management, Operational risk exposure, Capital, Leverage Ratio and MREL, Note 29 – Provisions |
| Exposures in equities not included in the trading book (Article 447) | Market Risk Management, Credit risk exposure, Note 1 - Significant accounting policies and critical accounting estimates, Note 13 - Financial instruments carried at fair value, Note 18 - Equity method investments, Note 46 - Shareholdings |
| Exposure to interest rate risk on positions not included in the trading book (Article 448) | Nontrading market risk, Nontrading market risk exposures |
| Securitization (Article 449) | Credit risk management, Market risk management, Note 1 - Significant accounting policies and critical accounting estimates, Note 13 - Financial instruments carried at fair value |
| Remuneration policy (Article 450) | Compensation report |
| Leverage (Article 451) | Risk management principles, Risk governance, Capital management, Leverage ratio |
| Use of the IRB approach to credit risk (Article 452) | Credit risk management, Credit risk exposure |
| Use of credit risk mitigation techniques (Article 453) | Credit risk management, Credit risk exposure |
| Use of the advanced measurement approaches to operational risk (Article 454) | Operational risk management, Operational risk exposure |
| Use of internal market risk models (Article 455) | Market risk management, Trading market risk exposures, Note 13 - Financial instruments carried at fair value |
| Liquidity | Liquidity risk management, Liquidity risk exposure |
| Business risk | Business (strategic) risk management |
| Disclosure requirements according to Article 26a German Banking Act (KWG) | Note 41 – Current and non-current assets and liabilities Note 42 – Events after the reporting period Note 44 – Supplementary Information to the consolidated financial statements according to sections 297 (1a) / 315a HGB and the return on assets according to Article 26a of the German Banking Act |

Risk management objectives and policies

Article 435 (1)(a) CRR - Risk management strategies and processes

Deutsche Bank Group discloses the risk management strategies and process in the Annual Report 2018 under sections “Risk management principles” on page 50 and “Risk governance” on page 51.

Credit risk management strategies and processes

The management of credit risk is described in section “Credit risk management” on page 61 in the 2018 Annual Report.

Market risk management strategies and processes

The management of market risk is described in section “Market risk management” on page 72 in the 2018 Annual Report.

Liquidity risk management strategies and processes

The management of liquidity is described in section “Liquidity risk management” on page 83 in the 2018 Annual Report.

Business risk management strategies and processes

The management of business risk is described in sections “Risk identification and assessment” and “Business (strategic) risk management” on pages 61 and 87 respectively in the 2018 Annual Report.

Operational risk management strategies and processes

The management of operational risk is described in section “Operational risk management” on page 78 in the 2018 Annual Report.

Reputational risk management strategies and processes

The management of reputational risk is described in section “Reputational risk management” on page 89 of the 2018 Annual Report.

Article 435 (1)(b) CRR - Risk management structure and organization

Deutsche Bank discloses the overall risk management structure and organization in the 2018 Annual Report, chapter “Risk and capital framework”, section “Risk governance” on page 51.

More detailed descriptions are provided in the following specific chapters.

Credit risk management structure and organization

The structure and organization of credit risk management is described in section “Credit risk management” on pages 61 in the 2018 Annual Report.

Market risk management structure and organization

The structure and organization of Market risk management is described in section “Market risk management”, in the 2018 Annual Report, specifically in the chapter “Market risk framework” on page 72, “Trading market risk” on page 72 and “Nontrading market risk” on page 76.

Liquidity risk management structure and organization

The structure and organization of liquidity risk management is described in section “Liquidity risk management”, in the 2018 Annual Report, specifically in the chapter “Liquidity risk management framework” on page 83, “Capital markets issuance” on page 83 and “Short term liquidity and wholesale funding” on page 83.

Business risk management structure and organization

Business risk is managed by the Risk Strategy team within Enterprise Risk Management. Further detail is provided in section “Business (strategic) risk management” in the 2018 Annual Report on page 87.

Operational risk management structure and organization

The structure and organization of operational risk management is described in section “Operational risk management” on page 78 in the 2018 Annual Report.

Reputational risk management structure and organization

The structure and organization of reputational risk management is described in section “Reputational risk management” on page 89 in the 2018 Annual Report.

Article 435 (1)(c) CRR - Scope and nature of risk reporting and measurement systems

The nature of our risk reporting and measurement systems are described in the section “Risk reporting and measurement systems” on page 57 of the Annual Report 2018.

Scope and nature of credit risk reporting and measurement systems

The scope and nature of our credit risk reporting and measurement systems are described in the section “Risk reporting and measurement systems” on page 57 of the Annual Report 2018.

Scope and nature of market risk reporting and measurement systems

The scope and nature of our market risk reporting and measurement systems are described in the section “Risk reporting and measurement systems” on page 57 of the Annual Report 2018.

Scope and nature of liquidity risk reporting and measurement systems

The scope and nature of our liquidity risk reporting and measurement systems are described in the section “Liquidity risk management” on page 83 and onwards of the Annual Report 2018.

Scope and nature of business risk reporting and measurement systems

Please refer to the section “Capital requirements”, chapter “Business risk economic capital model” on page 34 of this Pillar 3 report.

Scope and nature of operational risk reporting and measurement systems

The risk reporting and measurement methodology are described in section “Operational risk management” on page 78 in the 2018 Annual Report.

Scope and nature of reputational risk reporting and measurement systems

The scope and nature of our reputational risk reporting and measurement systems are described in the section “Risk reporting and measurement systems” on page 57 of the Annual Report 2018.

Article 435 (1)(d) CRR - Policies for hedging and mitigating risk

Policies for hedging and mitigating credit risk

The section "Managing and mitigation of credit risk" on page 66 in the Annual Report 2018 provides information on how our credit risk is hedged/mitigated on both counterparty and portfolio levels and exposures are disclosed in section "CIB credit exposure" and "CPSG risk mitigation for the CIB credit exposure" on pages 116-118 in the same report.

Policies for hedging and mitigating market risk

The approach to hedging and managing market risk is governed by policies explicitly designed to ensure that all hedging activities are risk reducing, not proprietary in nature and are documented prior to trade execution. Hedging activities are reviewed by the relevant business control forum. For a further description of the hedging approach for specific areas in the banking book, please refer to the section "Nontrading market risk" of the 2018 Annual Report on page 76.

Policies for hedging and mitigating liquidity risk

The policies for mitigating risk, and the strategies and processes for monitoring the continuing effectiveness of mitigants regarding liquidity risk are described in the section "Liquidity risk management" on page 83 and onwards of the Annual Report 2018.

Policies for hedging and mitigating operational risk

The risk mitigating processes regarding operational risk are described in section "Operational risk management" on page 78 in the 2018 Annual Report. The hedging of operational risk is described in "Article 454 CRR - Use of the Advanced Measurement Approaches to operational risk" on page 151 in this report.

Article 435 (1)(e) CRR - Declaration on the adequacy of risk management arrangements

Our Management Board confirms, for the purpose of Article 435 CRR, that our risk management systems are adequate with regard to our risk profile and strategy.

Article 435 (1)(f) CRR - Concise risk statement approved by the board

All individual information aspects of the article are addressed in the 2018 Annual Report, e.g. in the following combined set of sections, and regarded as concise statement.

| Article 435 (1)(f) CRR requirements | Reference sections from Deutsche Bank's Annual Report 2018 |
|-------------------------------------|--|
| Risk profile | Overall risk assessment (page 47) Risk profile (page 48) |
| Business strategy | Our business strategy (page XIX) Risks and opportunities (page 39) Strategic and capital plan (page 54) |
| Management of risk | Risk management principles (page 50) Risk governance (page 51) Risk reporting and measurement systems (page 57) Capital management (page 60) Resource limit setting (page 60) Risk identification and assessment (page 61) Credit risk management (page 61) Market risk management (page 72) Operational risk management (page 78) Liquidity risk management (page 83) Business (strategic) risk management (page 87) Reputational risk management (page 89) Model risk management (page 88) Risk concentration & diversification (page 89) |
| Risk tolerances | Risk appetite and capacity (page 54) |
| Key ratios and figures | Risk profile (page 48) Key risk metrics (page 46) Regulatory capital (page 90) Economic capital (page 99) Leverage ratio (page 100) Credit risk exposure (page 104) Asset quality (page 123) Trading market risk exposures (page 136) Nontrading market risk exposures (page 140) Operational risk exposure (page 142) Liquidity risk exposure (page 143) |

On this basis our Management Board, by approving the Annual Report 2018, also approved the concise statement as required by Article 435 (1)(f) CRR.

Article 435 (2)(a) CRR - Number of directorships held by board members

The number of directorships held by members of the management board is published in the section "Management board" from page 393 onwards in the Annual Report 2018.

Article 435 (2)(b) CRR - Recruitment policy for board members

Please refer to the section "Standing committees" and the sub-section therein "Nomination committee" on page 403 in our Annual Report 2018.

Article 435 (2)(c) CRR - Policy on diversity for board members

Please refer to the section "Diversity concept" on Deutsche Bank's approach and processes to support diversity, including diversity objectives, targets and achievements in relation to the management bodies in our Annual Report 2018 on page 412.

Page 412 of the Annual Report 2018 refers in "Targets for the proportion of women in management positions/gender quota" to Deutsche Bank's approach to the proportion of women in Supervisory Board as well as Management Board. It also shows targets for the first and second level reporting to the Management Board.

On page 393 of the Annual Report 2018, we provide information on duties and responsibilities and procedures of the Management Board including a reference to the respective Terms of Reference (ToR) link.

The Management Board ToR §5 (9) states inter alia: "In appointing people to management functions in the Group, the Management Board takes diversity into account and strives, in particular, to achieve an appropriate representation of women". The Annual Report 2018 provides on pages 398 to 402 similar information for the Supervisory Board with specific information on page 401 on "Objectives for the composition of the Supervisory Board, Profile of Requirements and status of implementation".

Article 435 (2)(d-e) CRR - Risk committee and information flow

Dedicated risk committees are in place both to support the Supervisory Board (the Risk Committee of the Supervisory Board) as well as the Management Board (the Group Risk Committee, "GRC").

Please refer to our Annual Report 2018, page VII, chapter "Report of the Supervisory Board", section "The committees of the Supervisory Board", paragraph "Risk committee" for the number of meetings the Risk committee of the Supervisory Board held in 2018.

The Group Risk Committee generally has held meetings once a week in 2018.

Please refer to our Annual Report 2018, page 57, chapter "Risk and capital framework", section "Risk reporting and measurement systems" for a description of the information flow.

Scope of application of the regulatory framework

Article 436 (a) CRR - Name of the institution

Deutsche Bank Aktiengesellschaft ("Deutsche Bank AG"), headquartered in Frankfurt am Main, Germany, is the parent institution of the Deutsche Bank Group of institutions (the "regulatory group"), which is subject to the supervisory regulations of the KWG and the SolvV, including the references to the CRR and CRD 4. Under Section 10a KWG in conjunction with Articles 11 and 18 CRR, a regulatory group of institutions consists of an institution (meaning a credit institution or an investment firm) as the parent company, and all other institutions and financial institutions (comprising inter alia financial holding companies, payment institutions, asset management companies) that are its subsidiaries within the meaning of Article 4 (16) CRR or are jointly managed together with other parties within the meaning of Article 18 (4) CRR. Subsidiaries are fully consolidated, while companies which are not subsidiaries are consolidated on a pro-rata basis.

Insurance companies and companies outside the banking and financial sector are not consolidated in the regulatory group of institutions. We do not qualify as a financial conglomerate and are not subject to the respective supplementary supervisions.

Article 436 (b) CRR - Difference in basis of consolidation for accounting and prudential purposes

The principles of consolidation for our regulatory group are not identical to those applied for our financial statements. Nonetheless, the majority of our subsidiaries in the regulatory group are also fully consolidated in accordance with IFRS in our consolidated financial statements.

The main differences between regulatory and accounting consolidation are:

- Subsidiaries outside the banking and financial sector are not consolidated within the regulatory group of institutions, but are included in the consolidated financial statements according to IFRS.
- Most of our Special Purpose Entities ("SPEs") consolidated under IFRS do not meet the regulatory subsidiary definition pursuant to Article 4 (1) (16) CRR and were consequently not consolidated within our regulatory group. However, the risks resulting from our exposures to such entities are reflected in the regulatory capital requirements.
- Only a few entities included in the regulatory group are not consolidated as subsidiaries for accounting purposes but are treated differently: four, mostly immaterial subsidiaries which were not consolidated for accounting purposes were consolidated within the regulatory group; one further entity was jointly managed by us and other owners and was consolidated on a pro-rata basis within the regulatory group while for financial accounting purposes it was treated as a fair value through profit or loss asset.

As of year-end 2018, our regulatory group comprised 463 entities (excluding the parent Deutsche Bank Aktiengesellschaft), of which one was consolidated on a pro-rata basis. The classification applied for these entities is in accordance with CRR. The regulatory group comprised 27 credit institutions, two payment institutions, 33 investment firms, 258 financial institutions, 16 financial holding companies, 13 asset management companies and 114 ancillary services undertakings.

The classification applied as of year-end 2017, was in accordance with KWG and our regulatory group comprised 535 entities (excluding the parent Deutsche Bank Aktiengesellschaft), of which one was consolidated on a pro-rata basis. The regulatory group comprised 92 credit institutions, one payment institution, 52 financial services institutions, 262 financial enterprises, seven asset management companies and 121 ancillary services undertakings.

53 entities were exempted from regulatory consolidation pursuant to Section 31 (3) KWG in conjunction with Article 19 CRR as per year end 2018 (year end 2017: 74 entities). These regulations allow the exclusion of small entities in the regulatory scope of application from consolidated regulatory reporting if either their total assets (including off-balance sheet items) are below € 10 million or below 1 % of our Group's total assets. Also these entities were not required to be consolidated in our financial statements in accordance with IFRS.

These regulatory unconsolidated entities have to be included in the deduction treatment for significant investments in financial sector entities pursuant to Article 36 (1) (i) CRR in conjunction with Article 43 (c) CRR. The book values of our participations in their equity included in the deduction treatment amounted to in total € 2 million as per year end 2018 (year end 2017: € 10 million). We further have applied the deduction treatment to 196 regulatory unconsolidated entities in the financial sector (including three insurance entities) where we have an investment of more than 10 % of the capital of these entities as per year

end 2018 (year end 2017: 208 entities). Pursuant to Article 36 (1) (i) CRR and in conjunction with Article 48 CRR, investments in the capital of financial sector entities have to be deducted from CET 1 capital if they exceed in sum 10 % of the institution's own CET 1 capital or if they exceed in aggregate with deferred tax assets that rely on future profitability and arise from temporary differences 15 % of the relevant CET 1 capital.

The table EU LI1 below provides an outline of the difference in the basis of consolidation for accounting and prudential purposes and also breaks down how the amounts reported in our financial statements, once the regulatory scope of consolidation is applied, are to be allocated to the different risk frameworks laid out in Part Three of the CRR. Consequently we split our regulatory balance sheet into the parts subject to credit risk, counterparty credit risk, securitization positions in the regulatory banking book, market risk as well as the part which is not subject to capital requirements or relevant for deduction from capital. The market risk framework in column (f) includes our trading book exposure, our banking book exposure which is booked in a currency different from Euro as well as securitization positions in the regulatory trading book. Specific assets and liabilities may be subject to more than one regulatory risk framework, therefore the sum of values in column (c) to (g) may not equal to that in column (b). Moreover the allocation of positions to the regulatory trading or banking book as well as the product definition impacts the allocation to and treatment within a regulatory framework and might be different to the product definition or trading classification under the accounting framework.

Differences between carrying values on the regulatory balance sheet in column (b) and amounts deducted from CRR/CRD 4 capital are explained further in the footnotes of the "Own funds template (incl. RWA and Capital Ratios)" as referenced in the last column of this table.

EU LI1 – Differences between accounting and regulatory scopes of consolidation and the mapping of financial statement categories with regulatory risk categories

| | Dec 31, 2018 | | | | | | | |
|--|---|---|--------------------------------------|---|---|--------------------------------------|--|-------------------------|
| | a | b | c | d | e | f | g | |
| | Carrying values of items: | | | | | | | |
| | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation | Subject to the credit risk framework | Subject to the counterparty credit risk framework | Subject to the securitization framework | Subject to the market risk framework | Not subject to capital requirements or subject to deduction from capital | References ¹ |
| in € m. | | | | | | | | |
| Assets: | | | | | | | | |
| Cash and central bank balances | 188,731 | 188,628 | 188,547 | 0 | 0 | 90,263 | 0 | |
| Interbank balances (w/o central banks) | 8,881 | 8,574 | 7,737 | 0 | 0 | 6,336 | 0 | |
| Central bank funds sold and securities purchased under resale agreements | 8,222 | 8,222 | 0 | 8,222 | 0 | 5,699 | 0 | |
| Securities borrowed | 3,396 | 3,396 | 0 | 3,396 | 0 | 2,895 | 0 | |
| Financial assets at fair value through profit or loss of which: | | | | | | | | |
| Trading assets | 152,738 | 151,384 | 4,587 | 0 | 151 | 150,476 | 0 | |
| Positive market values from derivative financial instruments | 320,058 | 320,372 | 12 | 319,990 | 378 | 319,766 | 0 | |
| Non-trading financial assets mandatory at fair value through profit and loss | 100,444 | 101,289 | 12,702 | 84,271 | 610 | 98,284 | 1,784 | |
| Financial assets designated at fair value through profit or loss | 104 | 104 | 104 | 0 | 0 | 104 | 0 | |
| Total financial assets at fair value through profit or loss | 573,344 | 573,149 | 17,405 | 404,261 | 1,139 | 568,630 | 1,784 | |
| Financial assets at Fair Value through OCI | | | | | | | | |
| Financial assets mandatory at fair value through OCI | 51,182 | 51,162 | 50,048 | 1,094 | 17 | 34,932 | 0 | |
| Equity Instruments designated at fair value through OCI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total financial assets at fair value through OCI | 51,182 | 51,162 | 50,048 | 1,094 | 17 | 34,932 | 0 | |
| Financial assets available for sale | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Equity method investments | 879 | 877 | 877 | 0 | 0 | 877 | 69 | |
| of which: Goodwill | 69 | 69 | 0 | 0 | 0 | 0 | 69 | E |
| Loans at amortized cost | 400,297 | 401,653 | 382,504 | 77 | 18,555 | 128,562 | 399 | |
| Securities held to maturity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Property and equipment | 2,421 | 2,267 | 2,267 | 0 | 0 | 332 | 0 | |
| Goodwill and other intangible assets | 9,141 | 8,947 | 0 | 0 | 0 | 0 | 8,947 | E |
| Other assets | 93,444 | 93,449 | 20,336 | 42,827 | 111 | 29,411 | 17,128 | |
| of which: Defined benefit pension fund assets | 1,111 | 1,111 | 0 | 0 | 0 | 0 | 1,111 | G |
| Assets for current tax | 970 | 960 | 960 | 0 | 0 | 0 | 0 | |
| Deferred tax assets | 7,230 | 7,186 | 4,453 | 0 | 0 | 2,510 | 2,733 | F |
| Total assets | 1,348,137 | 1,348,470 | 675,135 | 459,877 | 19,822 | 870,448 | 31,061 | |
| Liabilities and equity: | | | | | | | | |
| Deposits | 564,405 | 566,250 | 0 | 7,178 | 28 | 70,485 | 488,558 | |
| Central bank funds purchased and securities sold under repurchase agreements | 4,867 | 4,867 | 0 | 4,867 | 0 | 3,627 | 0 | |
| Securities loaned | 3,359 | 3,359 | 0 | 3,359 | 0 | 3,357 | 0 | |
| Financial liabilities at fair value through profit or loss of which: | | | | | | | | |
| Trading liabilities | 59,924 | 59,930 | 0 | 261 | 0 | 59,924 | 2 | |
| Negative market values from derivative financial instruments | 301,487 | 301,532 | 0 | 301,131 | 143 | 300,908 | 86 | |
| Financial liabilities designated at fair value through profit or loss | 53,757 | 53,427 | 0 | 52,233 | 0 | 53,059 | 2 | |
| Investment contract liabilities | 512 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total financial liabilities at fair value through profit or loss | 415,680 | 414,890 | 0 | 353,624 | 143 | 413,892 | 90 | |
| Other short-term borrowings | 14,158 | 14,917 | 0 | 0 | 0 | 703 | 14,214 | |
| Other liabilities | 117,513 | 116,327 | 0 | 70,987 | 0 | 34,262 | 26,918 | |
| Provisions | 2,711 | 2,677 | 0 | 0 | 0 | 598 | 2,079 | |
| Liabilities for current tax | 944 | 927 | 0 | 0 | 0 | 168 | 758 | |
| Deferred tax liabilities | 512 | 430 | 0 | 0 | 0 | 0 | 430 | |
| Long-term debt | 152,083 | 152,032 | 0 | 0 | 0 | 24,751 | 127,282 | |
| of which: Subordinated long-term debt ² | 7,144 | 7,144 | 0 | 0 | 0 | 849 | 6,295 | I,J |
| Trust preferred securities ² | 3,168 | 3,168 | 0 | 0 | 0 | 2,012 | 1,156 | I,J |
| Obligation to purchase common shares | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total liabilities | 1,279,400 | 1,279,844 | 0 | 440,015 | 171 | 553,855 | 661,485 | |

| | | | | | | | | Dec 31, 2018 |
|---|---|---|--------------------------------------|---|---|--------------------------------------|--|-------------------------|
| | a | b | c | d | e | f | g | |
| | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation | Carrying values of items: | | | | | References ¹ |
| in € m. | | | Subject to the credit risk framework | Subject to the counterparty credit risk framework | Subject to the securitization framework | Subject to the market risk framework | Not subject to capital requirements or subject to deduction from capital | |
| Common shares, no par value, nominal value of € 2.56 | 5,291 | 5,291 | 0 | 0 | 0 | 0 | 5,291 | A |
| Additional paid-in capital | 40,252 | 40,240 | 0 | 0 | 0 | 0 | 40,240 | A |
| Retained earnings | 16,714 | 16,564 | 0 | 0 | 0 | 0 | 16,564 | B |
| Common shares in treasury, at cost | (15) | (15) | 0 | 0 | 0 | 0 | (15) | A |
| Equity classified as obligation to purchase common shares | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| Accumulated other comprehensive income, net of tax | 253 | 382 | 0 | 0 | 0 | 0 | 382 | C |
| Total shareholders' equity | 62,495 | 62,462 | 0 | 0 | 0 | 0 | 62,462 | |
| Additional equity components | 4,675 | 4,675 | 0 | 0 | 0 | 0 | 4,675 | H |
| Noncontrolling interests | 1,568 | 1,489 | 0 | 0 | 0 | 0 | 1,489 | D |
| Total equity | 68,737 | 68,625 | 0 | 0 | 0 | 0 | 68,625 | |
| Total liabilities and equity | 1,348,137 | 1,348,470 | 0 | 440,015 | 171 | 553,855 | 730,110 | |

¹ References provide the mapping of regulatory balance sheet items used to calculate regulatory capital as reflected in the column "References" in "Own funds template (incl. RWA and Capital Ratios)". Where applicable, more detailed information are provided in the respective reference footnote section.

² Eligible Additional Tier 1 and Tier 2 instruments are reflected in these balance sheet positions with their values according to IFRS.

| | Dec 31, 2017 | | | | | | | |
|--|---|---|--------------------------------------|---|---|---|--|-------------------------|
| | a | b | c | d | e | f | g | |
| | Carrying values of items: | | | | | | | |
| in € m. | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation | Subject to the credit risk framework | Subject to the counterparty credit risk framework | Subject to the securitization framework | Subject to the market risk framework ¹ | Not subject to capital requirements or subject to deduction from capital | References ² |
| Assets: | | | | | | | | |
| Cash and central bank balances | 225,655 | 225,579 | 225,363 | 0 | 0 | 97,549 | 0 | |
| Interbank balances (w/o central banks) | 9,266 | 8,244 | 7,564 | 0 | 0 | 6,782 | 0 | |
| Central bank funds sold and securities purchased under resale agreements | 9,972 | 9,972 | 74 | 9,897 | 0 | 4,338 | 0 | |
| Securities borrowed | 16,732 | 16,732 | 0 | 16,718 | 0 | 16,258 | 0 | |
| Financial assets at fair value through profit or loss | | | | | | | | |
| of which: | | | | | | | | |
| Trading assets | 184,661 | 183,942 | 11,359 | 0 | 211 | 183,683 | 50 | |
| Positive market values from derivative financial instruments | 361,033 | 363,010 | 299 | 360,731 | 371 | 361,865 | 0 | |
| Financial assets designated at fair value through profit or loss | 91,276 | 90,259 | 11,936 | 78,138 | 0 | 85,737 | 0 | |
| Total financial assets at fair value through profit or loss | 636,970 | 637,213 | 23,594 | 438,869 | 582 | 631,286 | 50 | |
| Financial assets available for sale | 49,397 | 53,055 | 51,836 | 0 | 143 | 25,216 | 0 | |
| Equity method investments | 866 | 854 | 854 | 0 | 0 | 853 | 64 | |
| of which: Goodwill | 64 | 64 | 0 | 0 | 0 | 0 | 64 | E |
| Loans | 401,699 | 403,271 | 376,164 | 10,896 | 15,459 | 138,596 | 5 | |
| Securities held to maturity | 3,170 | 3,170 | 3,170 | 0 | 0 | 0 | 0 | |
| Property and equipment | 2,662 | 2,612 | 2,612 | 0 | 0 | 373 | 0 | |
| Goodwill and other intangible assets | 8,839 | 8,635 | 0 | 0 | 0 | 0 | 8,635 | E |
| Other assets | 101,491 | 102,859 | 8,429 | 61,222 | 56 | 44,946 | 20,377 | |
| of which: Defined benefit pension fund assets | 1,124 | 1,125 | 0 | 0 | 0 | 0 | 1,125 | G |
| Assets for current tax | 1,215 | 1,203 | 1,203 | 0 | 0 | 0 | 0 | |
| Deferred tax assets | 6,799 | 6,777 | 3,846 | 0 | 0 | 1,633 | 2,931 | F |
| Total assets | 1,474,732 | 1,480,174 | 704,708 | 537,603 | 16,241 | 967,830 | 32,063 | |
| Liabilities and equity: | | | | | | | | |
| Deposits | 581,873 | 586,059 | 0 | 9,674 | 48 | 87,637 | 488,700 | |
| Central bank funds purchased and securities sold under repurchase agreements | 18,105 | 18,105 | 0 | 18,106 | 0 | 16,465 | 0 | |
| Securities loaned | 6,689 | 6,689 | 0 | 6,689 | 0 | 6,581 | 0 | |
| Financial liabilities at fair value through profit or loss | | | | | | | | |
| of which: | | | | | | | | |
| Trading liabilities | 71,463 | 71,448 | 0 | 493 | 0 | 70,885 | 69 | |
| Negative market values from derivative financial instruments | 342,726 | 344,487 | 0 | 343,960 | 138 | 343,591 | 88 | |
| Financial liabilities designated at fair value through profit or loss | 63,874 | 63,463 | 0 | 63,030 | 0 | 63,462 | 0 | |
| Investment contract liabilities | 574 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total financial liabilities at fair value through profit or loss | 478,636 | 479,398 | 0 | 408,009 | 138 | 477,939 | 158 | |
| Other short-term borrowings | 18,411 | 18,169 | 0 | 0 | 0 | 1,549 | 16,620 | |
| Other liabilities | 132,207 | 132,102 | 0 | 84,043 | 0 | 46,526 | 19,950 | |
| Provisions | 4,158 | 4,117 | 0 | 0 | 0 | 1,105 | 3,013 | |
| Liabilities for current tax | 1,000 | 986 | 0 | 0 | 0 | 857 | 128 | |
| Deferred tax liabilities | 346 | 280 | 0 | 0 | 0 | 0 | 280 | |
| Long-term debt | 159,715 | 160,818 | 0 | 0 | 0 | 12,713 | 148,105 | |
| of which: Subordinated long-term debt ³ | 8,100 | 8,100 | 0 | 0 | 0 | 828 | 7,272 | I,J |
| Trust preferred securities ⁴ | 5,492 | 5,492 | 0 | 0 | 0 | 4,577 | 915 | I,J |
| Obligation to purchase common shares | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total liabilities | 1,406,633 | 1,412,216 | 0 | 525,995 | 186 | 655,949 | 677,869 | |
| Common shares, no par value, nominal value of € 2.56 | 5,291 | 5,291 | 0 | 0 | 0 | 0 | 5,291 | A |
| Additional paid-in capital | 39,918 | 39,913 | 0 | 0 | 0 | 0 | 39,913 | A |
| Retained earnings | 17,454 | 17,226 | 0 | 0 | 0 | 0 | 17,226 | B |
| Common shares in treasury, at cost | (8) | (8) | 0 | 0 | 0 | 0 | (8) | A |
| Equity classified as obligation to purchase common shares | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A |
| Accumulated other comprehensive income, net of tax | 519 | 696 | 0 | 0 | 0 | 0 | 696 | C |
| Total shareholders' equity | 63,174 | 63,117 | 0 | 0 | 0 | 0 | 63,117 | |
| Additional equity components | 4,675 | 4,675 | 0 | 0 | 0 | 0 | 4,675 | H |
| Noncontrolling interests | 250 | 167 | 0 | 0 | 0 | 0 | 167 | D |

| | | | | | | | | Dec 31, 2017 |
|-------------------------------------|---|---|--------------------------------------|---|---|---|--|--|
| | | | | | | | | References ² |
| | | | | | | | | Carrying values of items: |
| | | | | | | | | Not subject to capital requirements or subject to deduction from capital |
| | | | | | | | | References ² |
| in € m. | a | b | c | d | e | f | g | |
| | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation | Subject to the credit risk framework | Subject to the counterparty credit risk framework | Subject to the securitization framework | Subject to the market risk framework ¹ | Subject to capital requirements or subject to deduction from capital | |
| Total equity | 68,099 | 67,959 | 0 | 0 | 0 | 0 | 67,959 | |
| Total liabilities and equity | 1,474,732 | 1,480,174 | 0 | 525,995 | 186 | 655,949 | 745,828 | |

¹ The approach to assign positions to the market risk framework has been revised for deferred tax assets to account also for the non-EUR portion. The numbers for year end 2017 have been adjusted accordingly.

² References provide the mapping of regulatory balance sheet items used to calculate regulatory capital as reflected in the column "References" in "Own funds template (incl. RWA and Capital Ratios)". Where applicable, more detailed information are provided in the respective reference footnote section.

³ Eligible Additional Tier 1 and Tier 2 instruments are reflected in these balance sheet positions with their values according to IFRS.

For the current fiscal year, we provide information following the IFRS 9 accounting standard, while previous year numbers are based on the IAS 39 accounting rules and are presented in the old format. Since the accounting requirements have changed significantly, numbers are not comparable. For further information please refer to our Annual Report 2018, Note 2 "Recently adopted and new accounting pronouncements" - "IFRS 9 transition impact analysis" on page 250 to the consolidated financial statements.

Movement in balances in Carrying value as reported in published financial statements (a) and carrying values under scope of regulatory consolidation (b) comparing December 31, 2018 to December 31, 2017 are presented in our Annual Report 2018 in the Management Report section. The chapter "Operating and financial review – Financial position" on page 28 provides a detailed explanation of the same.

Previous year balances have been restated in respect to deposits and provisions based on a change in our accounting policy for the obligations related to interest bonuses on home savings contracts. Additional details can be obtained from our Annual Report 2018, Note 1 "Significant accounting policies and critical accounting estimates" to the consolidated financial statements on page 223.

Table EU LI2 presents a description of the differences between the financial statements' carrying value amounts under the regulatory scope of consolidation and the exposure amounts used for regulatory purposes.

EU LI2 – Main sources of differences between regulatory exposure amounts and carrying values in financial statements

| | | | | | | Dec 31, 2018 |
|---------|--|-----------|-----------|---------|--------|------------------------------------|
| | | | | | | Items subject to: |
| | | | | | | Market risk framework |
| | | | | | | Securitization framework |
| | | | | | | Counterparty credit risk framework |
| | | | | | | Credit risk framework |
| | | | | | | Total |
| in € m. | a | b | c | d | e | |
| 1 | Asset carrying value amount under the regulatory scope of consolidation (as per template EU LI1) | 1,348,470 | 675,135 | 459,878 | 19,822 | 870,447 |
| 2 | Liabilities carrying value amount under the regulatory scope of consolidation (as per template EU LI1) | 1,279,844 | 0 | 440,015 | 171 | 553,855 |
| 3 | Total net amount under the regulatory scope of consolidation | 68,626 | 675,135 | 19,863 | 19,651 | 316,592 ⁵ |
| 4 | Off-balance-sheet amounts | 263,355 | 240,744 | 4,943 | 14,723 | 0 |
| 5a | Differences in valuations for derivatives and SFT (incl. impact from different netting rules) ¹ | – | 0 | 141,567 | 301 | 0 |
| 5b | Differences in valuations for securitization positions ² | – | (19,618) | (2,331) | 35,089 | 1,171 |
| 5c | Differences in valuations for off-balance sheet amounts | – | (136,710) | 0 | 0 | 0 |
| 6 | Differences due to financial collateral considered in standardized approach | – | (3,342) | (275) | 0 | 0 |
| 7 | Differences due to consideration of provisions ³ | – | 6,123 | 0 | 0 | 0 |
| 8 | Differences due to dilution risk | – | 8,208 | 0 | 0 | 0 |
| 9 | Other differences ⁴ | – | 6,237 | 2,846 | 0 | 0 |
| 10 | Exposure amounts considered for regulatory purposes | 1,018,617 | 776,777 | 166,614 | 69,764 | 5,251 ⁶ |

¹ Includes effects due to differences in exposure modelling applying the effective expected positive exposure (EEPE) as well as the mark to market method for derivatives and financial collateral comprehensive method for SFT respectively; that also reflects differences as a result of the application of credit risk mitigation and regulatory netting rules.

² Included in the sum of € 35.1 billion are € 14.2 billion resulting from synthetic securitizations where CCF are set to a level of 1 and FX mismatches have to be considered amounting to € 1.3 billion. The amount represents the retained synthetic tranches after consideration of bought credit protection.

³ Includes credit-risk related purchase price adjustments arising in the context of asset purchases as well as business combinations.

⁴ Primarily reflects valuation differences as a result of regulatory product definition being different from the accounting product definition; moreover under the counterparty credit risk framework funded default fund contribution in form of securities are considered in the exposure amounts for regulatory purposes.

⁵ Included in the sum of € 316.6 billion are € 4.1 billion net carrying amount attributable to securitization positions in the regulatory trading book covered under the market risk standardized approach.

⁶ Exposure at default is only considered for securitization positions in the regulatory trading book as the remaining exposure is considered within the internally developed market risk models.

| | | Dec 31, 2017 | | | | |
|---------|--|-----------------------|------------------------------------|--------------------------|-----------------------|----------------------|
| | | a | b | c | d | e |
| | | Items subject to: | | | | |
| in € m. | Total | Credit risk framework | Counterparty credit risk framework | Securitization framework | Market risk framework | |
| 1 | Asset carrying value amount under the regulatory scope of consolidation (as per template EU LI1) | 1,480,174 | 704,708 | 537,603 | 16,241 | 967,830 ⁵ |
| 2 | Liabilities carrying value amount under the regulatory scope of consolidation (as per template EU LI1) | 1,412,215 | 0 | 525,995 | 186 | 655,949 |
| 3 | Total net amount under the regulatory scope of consolidation | 67,959 | 704,708 | 11,608 | 16,056 | 311,881 ⁶ |
| 4 | Off-balance-sheet amounts | 250,252 | 234,145 | 4,362 | 10,228 | 0 |
| 5a | Differences in valuations for derivatives and SFT (incl. impact from different netting rules) ¹ | – | 0 | 190,148 | 337 | 0 |
| 5b | Differences in valuations for securitization positions ² | – | (20,507) | (2,193) | 36,182 | 2,028 |
| 5c | Differences in valuations for off-balance sheet amounts | – | (131,833) | 0 | 0 | 0 |
| 6 | Differences due to financial collateral considered in standardized approach | – | (2,490) | (708) | 0 | 0 |
| 7 | Differences due to consideration of provisions ³ | – | 4,521 | 0 | 0 | 0 |
| 8 | Differences due to dilution risk | – | 6,066 | 0 | 0 | 0 |
| 9 | Other differences ⁴ | – | 7,205 | 3,282 | 0 | 0 |
| 10 | Exposure amounts considered for regulatory purposes | 1,077,058 | 801,815 | 206,499 | 62,802 | 5,942 ⁷ |

¹ Includes effects due to differences in exposure modelling applying the effective expected positive exposure (EEPE) as well as the mark to market method for derivatives and financial collateral comprehensive method for SFT respectively; that also reflects differences as a result of the application of credit risk mitigation and regulatory netting rules.

² Included in the sum of € 36.2 billion are € 14.3 billion resulting from synthetic securitizations where CCF are set to a level of 1 and FX mismatches have to be considered amounting to € 1.3 billion. The amount represents the retained synthetic tranches after consideration of bought credit protection.

³ Includes credit-risk related purchase price adjustments arising in the context of asset purchases as well as business combinations.

⁴ Primarily reflects valuation differences as a result of regulatory product definition being different from the accounting product definition; moreover under the counterparty credit risk framework funded default fund contribution in form of securities are considered in the exposure amounts for regulatory purposes.

⁵ The approach to assign positions to the market risk framework has been revised for deferred tax assets to account also for the non-EUR portion. The numbers for year end 2017 have been adjusted accordingly.

⁶ Included in the sum of € 311.9 billion are € 3.9 billion net carrying amount attributable to securitization positions in the regulatory trading book covered under the market risk standardized approach.

⁷ Exposure at default is only considered for securitization positions in the regulatory trading book as the remaining exposure is considered within the internally developed market risk models.

For table EU LI3 which provides an outline of the differences in the scopes of consolidation on an entity-by-entity-basis please refer to our Annual Report 2018, Note 46 “Shareholdings” to the consolidated financial statements on pages 363 to 382.

Article 436 (c) CRR - Impediments to fund transfers

The Group entities within the scope of prudential consolidation are subject to local regulatory and tax requirements as well as potentially exchange controls. We are not aware of any material impediments existing for capital distribution within the Group.

Article 436 (d) CRR - Potential capital shortfalls in unconsolidated subsidiaries

Our subsidiaries which were not included in our regulatory consolidation due to their immateriality did not have to comply with own minimum capital standards in 2018.

Article 436 (e) CRR - Derogations from prudential or liquidity requirements for subsidiaries

As of December 31, 2018, Deutsche Bank AG fully applied the exemptions pursuant to Section 2a (1) KWG in conjunction with Article 7 (3) CRR, Art. 6 (5) CRR and Section 2a (2) KWG in conjunction with Section 25a (1) sentence 3 KWG (so-called “parent waiver”) pursuant to which it may waive the application of provisions on own funds (Part II CRR), capital requirements (Part III CRR), large exposures (Part IV CRR), exposures to transferred credit risks (Part V CRR), leverage (Part VII CRR) and disclosure by institutions (Part VIII CRR) as well as certain risk management requirements (Section 25a (1) sentence 3 KWG) on a stand-alone basis.

Deutsche Bank AG’s subsidiaries DB Privat- und Firmenkundenbank AG (before May 12, 2018, Deutsche Bank Privat- und Geschäftskunden Aktiengesellschaft), norisbank GmbH, Deutsche Bank Europe GmbH and Sal. Oppenheim jr. & Cie. AG & Co. KGaA, which all were consolidated within the Deutsche Bank regulatory group, fully applied the exemptions pursuant to Section 2a (1) KWG in conjunction with Article 7 (1) CRR, Art. 6 (5) CRR and Section 2a (2) KWG in conjunction with

Section 25a (1) sentence 3 KWG (so-called “subsidiary waiver”) pursuant to which they may waive certain regulatory requirements to the same extent as Deutsche Bank AG (see preceding paragraph) on a stand-alone basis. In addition, Deutsche Bank AG’s subsidiaries Deutsche Immobilien Leasing GmbH and Leasing Verwaltungsgesellschaft Waltersdorf mbH, also consolidated within the Deutsche Bank regulatory group, applied the “subsidiary waiver” rules to the extent applicable to them, i.e. with regard to certain risk management requirements pursuant to Section 25a (1) sentence 3 KWG.

These exemptions are available only for group companies in Germany and can only be applied if, amongst others, the risk strategies and risk management processes of Deutsche Bank AG or the Group also include the companies that apply the “waiver” rules and there is no material practical or legal impediment to the prompt transfer of own funds or repayment of liabilities from Deutsche Bank AG to the respective subsidiaries or from subsidiaries in the Group to Deutsche Bank AG.

The application of the aforementioned exemptions and the fulfillment of the respective requirements were notified to the BaFin and Deutsche Bundesbank on the basis of Section 2a (1) or (6) KWG in its version applicable until December 31, 2013. Pursuant to Section 2a (5) KWG the exemptions based on these notifications are grandfathered, i.e. the “waivers” are deemed to be granted under the current CRR and KWG rules. With regard to DB Privat- und Firmenkundenbank AG, the European Central Bank (ECB) has renewed the “waiver” in connection with the merger with Deutsche Postbank AG in May 2018.

Article 18 CRR Additional Disclosure Requirements for Significant Subsidiaries

In line with Article 13 (1) CRR our significant subsidiaries and those subsidiaries which are of significance for their local market are required to disclose information to the extent applicable in respect of own funds, capital requirements, capital buffers, credit risk adjustments, remuneration policy, leverage and use of credit risk mitigation techniques on an individual or sub-consolidated basis.

For some of our subsidiaries located in Germany it is not mandatory to calculate or report regulatory capital or leverage ratios on a stand-alone basis if they qualify for the exemptions codified in the waiver rule pursuant to Section 2a KWG in conjunction with Article 7 CRR. In these cases, the above-mentioned disclosure requirements are also not applicable for those subsidiaries.

In order to identify significant subsidiaries a catalogue of criteria has been developed, applied to all subsidiaries classified as “credit institution” or “investment firm” under the CRR and not qualifying for a waiver status pursuant to Section 2a KWG in conjunction with Article 7 CRR. A subsidiary is required to comply with the requirements in Article 13 CRR (as described above) if at least one criterion mentioned in the list below has been met. The criteria have been defined in relation to our business activities as well as the complexity and risk profile of the respective subsidiary. All figures referenced below are calculated on an IFRS basis as of December 31, 2018:

- Total Assets of € 30 billion or more (on individual or sub-consolidated basis)
- Five percent or more of our risk-weighted assets on group level
- 20 percent or more of the gross domestic product in its respective country, in which the subsidiary is located, but at least total assets of € five billion (on individual or sub-consolidated basis)
- Institutions directly supported by the European Stability Mechanism (ESM), European Financial Stability Facility (EFSF) or similar mechanisms
- Institutions belonging to the three largest institutions in their respective countries, in which the subsidiary is located (referring to the amount of total assets)
- Classification as “local systemically important institution” by the local competent authority

None of our subsidiaries have received support from any kind of stability mechanism.

As a result of the selection process described above, we identified two subsidiaries as “significant” for the Group and hence required to provide additional disclosure requirements as laid down in Article 13 CRR:

- Deutsche Bank Luxembourg S.A., Luxembourg
- DB USA Corporation, United States of America

The additional disclosures for our significant subsidiaries in relation to Article 13 CRR can be found either within the Pillar 3 Reports of the respective subsidiary as published on its website or on the Group’s website for DB USA Corporation.

Own funds

Capital adequacy

The calculation of our regulatory capital incorporates the capital requirements following the “Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms” (Capital Requirements Regulation or “CRR”) and the “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 4 or “CRD 4”) as implemented into German law. The information in this section as well as in the section “Article 438 (c-f) CRR - Overview of capital requirements” is based on the regulatory principles of consolidation.

Article 437 (1)(a,d-e) CRR - Regulatory capital composition, prudential filters and deduction items

Development of regulatory capital

Our CRR/CRD 4 Tier 1 capital as of December 31, 2018 amounted to € 55.1 billion, consisting of a Common Equity Tier 1 (CET 1) capital of € 47.5 billion and Additional Tier 1 (AT1) capital of € 7.6 billion. The CRR/CRD 4 Tier 1 capital was € 0.4 billion lower than at the end of June 2018, driven by a decrease in CET 1 capital of € 0.4 billion.

The € 0.4 billion decrease of CRR/CRD 4 CET 1 capital was largely the result of negative effects from regulatory adjustments from prudential filters (Additional valuation adjustments) of € 0.3 billion and CET 1 capital deduction of irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme of € 0.1 billion. As of December 31, 2018 our positive net income of € 0.3 billion was completely offset by our dividend and AT1 coupon accrual of € 0.3 billion for the year-end 2018 which is in line with the ECB Decision (EU) (2015/656) on the recognition of interim or year-end profits in CET 1 capital in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4).

Our fully loaded CRR/CRD 4 Tier 1 capital as of December 31, 2018 was € 52.1 billion, compared to € 52.5 billion at the end of June 2018. Our fully loaded CRR/CRD 4 CET 1 capital amounted to € 47.5 billion as of December 31, 2018, compared to € 47.9 billion as of June 30, 2018. Our fully loaded CRR/CRD 4 Additional Tier 1 capital amounted to € 4.6 billion as per end of December 2018, unchanged compared to June 2018.

Own funds template (incl. RWA and capital ratios)

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | | References ¹ | |
|---|--|-----------------|------------------------|-----------------|-------------------------|---|
| | CRR/CRD 4 fully-loaded | CRR/CRD 4 | CRR/CRD 4 fully loaded | CRR/CRD 4 | | |
| Common Equity Tier 1 (CET 1) capital: instruments and reserves | | | | | | |
| Capital instruments, related share premium accounts and other | | | | | | |
| 1 | reserves | 45,515 | 45,515 | 45,347 | 45,347 | A |
| | of which: Instrument type 1 (ordinary shares) ² | 45,515 | 45,515 | 45,347 | 45,347 | A |
| | of which: Instrument type 2 | 0 | 0 | 0 | 0 | |
| | of which: Instrument type 3 | 0 | 0 | 0 | 0 | |
| 2 | Retained earnings | 16,297 | 16,297 | 16,360 | 16,360 | B |
| 3 | Accumulated other comprehensive income (loss), net of tax | 382 | 382 | 449 | 449 | C |
| 3a | Funds for general banking risk | 0 | 0 | 0 | 0 | |
| | Amount of qualifying items referred to in Art. 484 (3) CRR and the related share premium accounts subject to phase-out from CET 1 | N/M | 0 | N/M | 0 | |
| 4 | Minority interests (amount allowed in consolidated CET 1) | 846 | 846 | 861 | 861 | D |
| | Independently reviewed interim profits net of any foreseeable charge or dividend ³ | 0 | 0 | 0 | 0 | B |
| 6 | Common Equity Tier 1 (CET 1) capital before regulatory adjustments | 63,041 | 63,041 | 63,016 | 63,016 | |
| Common Equity Tier 1 (CET 1) capital: regulatory adjustments | | | | | | |
| 7 | Additional value adjustments (negative amount) ⁴ | (1,504) | (1,504) | (1,214) | (1,214) | |
| | Goodwill and other intangible assets (net of related tax liabilities) (negative amount) | (8,566) | (8,566) | (8,500) | (8,500) | E |
| | Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (negative amount) | (2,758) | (2,758) | (2,865) | (2,865) | F |
| 10 | Fair value reserves related to gains or losses on cash flow hedges | (25) | (25) | (25) | (25) | |
| | Negative amounts resulting from the calculation of expected loss amounts ⁵ | (367) | (367) | (191) | (191) | |
| 12 | Any increase in equity that results from securitized assets (negative amount) | (1) | (1) | 0 | 0 | |
| 13 | Gains or losses on liabilities designated at fair value resulting from changes in own credit standing ⁶ | (304) | (304) | (438) | (438) | |
| 14 | Defined benefit pension fund assets (negative amount) | (1,111) | (1,111) | (1,043) | (1,043) | G |
| 15 | Direct, indirect and synthetic holdings by an institution of own CET 1 instruments (negative amount) ⁷ | (25) | (25) | (42) | (42) | |
| 16 | Direct, indirect and synthetic holdings of the CET 1 instruments of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount) | 0 | 0 | 0 | 0 | |
| 17 | Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above 10 % threshold and net of eligible short positions) (negative amount) ⁸ | 0 | 0 | 0 | 0 | |
| 18 | Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above 10 % threshold and net of eligible short positions) (negative amount) | 0 | 0 | 0 | 0 | |
| 19 | Exposure amount of the following items which qualify for a risk weight of 1,250 %, where the institution opts for the deduction alternative of which: | 0 | 0 | 0 | 0 | |
| 20a | Qualifying holdings outside the financial sector (negative amount) | 0 | 0 | 0 | 0 | |
| 20b | Securitization positions (negative amount) | 0 | 0 | 0 | 0 | |
| 20c | Free deliveries (negative amount) | 0 | 0 | 0 | 0 | |
| 20d | Deferred tax assets arising from temporary differences (amount above 10 % threshold, net of related tax liabilities where the conditions in Article 38 (3) CRR are met) (negative amount) | 0 | 0 | 0 | 0 | F |
| 21 | Amount exceeding the 15 % threshold (negative amount) | 0 | 0 | 0 | 0 | |
| | of which: | | | | | |
| | Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities | 0 | 0 | 0 | 0 | |
| 23 | Deferred tax assets arising from temporary differences | 0 | 0 | 0 | 0 | F |
| 25 | Losses for the current financial year (negative amount) | 0 | 0 | 0 | 0 | |
| 25a | Foreseeable tax charges relating to CET 1 items (negative amount) | 0 | 0 | 0 | 0 | |
| 25b | Regulatory adjustments relating to unrealized gains and losses pursuant to Article 467 and 468 CRR | N/M | N/M | N/M | N/M | |
| 26a | Amount to be deducted from or added to CET 1 capital with regard to additional filters and deductions required pre CRR ⁹ | N/M | N/M | (14) | (14) | |
| 26b | Qualifying AT1 deductions that exceed the AT1 capital of the institution (negative amount) | 0 | 0 | 0 | 0 | |
| 27 | Other regulatory adjustments | (895) | (895) | (801) | (801) | |
| 27a | Total regulatory adjustments to Common Equity Tier 1 (CET 1) capital | (15,555) | (15,555) | (15,133) | (15,133) | |

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | | References ¹ |
|--|------------------------|---------------|------------------------|---------------|-------------------------|
| | CRR/CRD 4 fully loaded | CRR/CRD 4 | CRR/CRD 4 fully loaded | CRR/CRD 4 | |
| 29 Common Equity Tier 1 (CET 1) capital | 47,486 | 47,486 | 47,884 | 47,884 | |
| Additional Tier 1 (AT1) capital: instruments | | | | | |
| 30 Capital instruments and the related share premium accounts of which: | 4,676 | 4,676 | 4,676 | 4,676 | H |
| 31 Classified as equity under applicable accounting standards | 4,676 | 4,676 | 4,676 | 4,676 | H |
| 32 Classified as liabilities under applicable accounting standards | 0 | 0 | 0 | 0 | |
| 33 Amount of qualifying items referred to in Article 484 (4) CRR and the related share premium accounts subject to phase out from AT1 | N/M | 3,009 | N/M | 2,973 | I |
| 34 Qualifying Tier 1 capital included in consolidated AT1 capital issued by subsidiaries and held by third parties | 0 | 0 | 0 | 0 | |
| 35 of which: instruments issued by subsidiaries subject to phase out | N/M | 0 | N/M | 0 | |
| 36 Additional Tier 1 (AT1) capital before regulatory adjustments | 4,676 | 7,685 | 4,676 | 7,648 | |
| Additional Tier 1 (AT1) capital: regulatory adjustments | | | | | |
| 37 Direct, indirect and synthetic holdings by an institution of own AT1 instruments (negative amount) | (80) | (80) | (80) | (80) | H |
| 38 Direct, indirect and synthetic holdings of the AT1 instruments of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount) | 0 | 0 | 0 | 0 | |
| 39 Direct, indirect and synthetic holdings of the AT1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above the 10 % threshold and net of eligible short positions) (negative amount) ⁸ | 0 | 0 | 0 | 0 | |
| 40 Direct, indirect and synthetic holdings by the institution of the AT1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above the 10 % threshold net of eligible short positions) (negative amount) | 0 | 0 | 0 | 0 | |
| 41a Residual amounts deducted from AT1 capital with regard to deduction from CET 1 capital during the transitional period pursuant to Article 472 CRR of which: | N/M | N/M | N/M | N/M | |
| Goodwill and other intangible assets (net of related tax liabilities) | N/M | N/M | N/M | N/M | E |
| Negative amounts resulting from the calculation of expected loss amounts | N/M | N/M | N/M | N/M | |
| 42 Qualifying T2 deductions that exceed the T2 capital of the institution (negative amount) | 0 | 0 | 0 | 0 | |
| 43 Total regulatory adjustments to Additional Tier 1 (AT1) capital | (80) | (80) | (80) | (80) | |
| 44 Additional Tier 1 (AT1) capital | 4,595 | 7,604 | 4,596 | 7,568 | |
| 45 Tier 1 capital (T1 = CET 1 + AT1) | 52,082 | 55,091 | 52,479 | 55,452 | |
| Tier 2 (T2) capital: instruments and provisions | | | | | |
| 46 Capital instruments and the related share premium accounts ¹⁰ | 9,340 | 6,331 | 9,366 | 6,393 | J |
| 47 Amount of qualifying items referred to in Article 484 (5) CRR and the related share premium accounts subject to phase out from T2 | N/M | 0 | N/M | 0 | J |
| 48 Qualifying own funds instruments included in consolidated T2 capital issued by subsidiaries and held by third parties | 23 | 23 | 23 | 23 | J |
| 49 of which: instruments issued by subsidiaries subject to phase out | N/M | 0 | N/M | 0 | |
| 50 Credit risk adjustments | 0 | 0 | 0 | 0 | |
| 51 Tier 2 (T2) capital before regulatory adjustments | 9,363 | 6,354 | 9,389 | 6,416 | |
| Tier 2 (T2) capital: regulatory adjustments | | | | | |
| 52 Direct, indirect and synthetic holdings by an institution of own T2 instruments and subordinated loans (negative amount) | (152) | (152) | (157) | (157) | J |
| 53 Direct, indirect and synthetic holdings of the T2 instruments and subordinated loans of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount) | 0 | 0 | 0 | 0 | |
| 54 Direct, indirect and synthetic holdings of the T2 instruments and subordinated loans of financial sector entities where the institution does not have a significant investment in those entities (amount above 10 % threshold and net of eligible short positions) (negative amount) ⁹ | 0 | 0 | 0 | 0 | |
| 55 Direct and indirect holdings by the institution of the 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) | 0 | 0 | 0 | 0 | |
| 56a Residual amounts deducted from Tier 2 capital with regard to deduction from Common Equity Tier 1 capital during the transitional period pursuant to Article 472 CRR of which: | N/M | N/M | N/M | N/M | |

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | | References ¹ |
|---|------------------------|----------------|------------------------|----------------|-------------------------|
| | CRR/CRD 4 fully-loaded | CRR/CRD 4 | CRR/CRD 4 fully loaded | CRR/CRD 4 | |
| Negative amounts resulting from the calculation of expected loss amounts | N/M | N/M | N/M | N/M | |
| 57 Total regulatory adjustments to Tier 2 (T2) capital | (152) | (152) | (157) | (157) | |
| 58 Tier 2 (T2) capital | 9,211 | 6,202 | 9,233 | 6,260 | |
| 59 Total capital (TC = T1 + T2) | 61,292 | 61,292 | 61,712 | 61,712 | |
| 60 Total risk-weighted assets | 350,432 | 350,432 | 348,319 | 348,319 | |
| of which: | | | | | |
| Credit Risk (including Settlement Risk) | 212,913 | 212,913 | 215,508 | 215,508 | |
| Credit Valuation Adjustment (CVA) | 7,997 | 7,997 | 8,885 | 8,885 | |
| Market Risk | 37,535 | 37,535 | 30,437 | 30,437 | |
| Operational Risk | 91,989 | 91,989 | 93,489 | 93,489 | |
| Capital ratios and buffers | | | | | |
| 61 Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets) | 13.6 | 13.6 | 13.7 | 13.7 | |
| 62 Tier 1 capital ratio (as a percentage of risk-weighted assets) | 14.9 | 15.7 | 15.1 | 15.9 | |
| 63 Total capital ratio (as a percentage of risk-weighted assets) | 17.5 | 17.5 | 17.7 | 17.7 | |
| 64 Institution specific buffer requirement (CET 1 requirement in accordance with Art. 92 (1) (a) CRR plus capital conservation and countercyclical buffer requirements, plus systemic risk buffer, plus the systemically important institution buffer (G-SII or O-SII buffer), expressed as a percentage of risk-weighted assets) ¹¹ | 11.8 | 10.7 | 11.8 | 10.7 | |
| of which: | | | | | |
| 65 Capital conservation buffer requirement | 2.5 | 1.875 | 2.5 | 1.875 | |
| 66 Countercyclical buffer requirement | 0.07 | 0.07 | 0.04 | 0.04 | |
| 67 Systemic risk buffer requirement | 0.0 | 0.0 | 0.0 | 0.0 | |
| 67a Global Systemically Important Institution (G-SII) or Other Systemically Important Institution (O-SII) buffer | 2.0 | 1.5 | 2.0 | 1.5 | |
| 68 Common Equity Tier 1 capital available to meet buffers (as a percentage of risk-weighted assets) ¹² | 13.4 | 13.6 | 13.6 | 13.7 | |
| Amounts below the thresholds for deduction (before risk weighting) | | | | | |
| 72 Direct, indirect and synthetic holdings of the capital of financial sector entities where the institution does not have a significant investment in those entities (amount below 10 % threshold and net of eligible short positions) ⁸ | 3,564 | 3,564 | 3,943 | 3,943 | |
| 73 Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount below 10 % threshold and net of eligible short positions) | 776 | 776 | 747 | 747 | |
| 75 Deferred tax assets arising from temporary differences (amount below 10 % threshold, net of related tax liability where the conditions in Article 38 (3) CRR are met) | 4,453 | 4,453 | 4,081 | 4,081 | |
| Applicable caps on the inclusion of provisions in Tier 2 capital | | | | | |
| 76 Credit risk adjustments included in T2 in respect of exposures subject to standardized approach (prior to the application of the cap) | 0 | 0 | 0 | 0 | |
| 77 Cap on inclusion of credit risk adjustments in T2 under standardized approach | 247 | 247 | 260 | 260 | |
| 78 Credit risk adjustments included in T2 in respect of exposures subject to internal ratings-based approach (prior to the application of the cap) | 0 | 0 | 0 | 0 | |
| 79 Cap for inclusion of credit risk adjustments in T2 under internal ratings-based approach | 1,026 | 1,026 | 1,041 | 1,041 | |
| Capital instruments subject to phase-out arrangements | | | | | |
| 80 Current cap on CET 1 instruments subject to phase out arrangements | N/M | 0 | N/M | 0 | |
| 81 Amount excluded from CET 1 due to cap (excess over cap after redemptions and maturities) | N/M | 0 | N/M | 0 | |
| 82 Current cap on AT1 instruments subject to phase out arrangements | N/M | 6,263 | N/M | 6,263 | |
| 83 Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities) | N/M | 0 | N/M | 0 | |
| 84 Current cap on T2 instruments subject to phase out arrangements | N/M | 1,688 | N/M | 1,688 | |
| 85 Amount excluded from T2 due to cap (excess over cap after redemptions and maturities) | N/M | 0 | N/M | 0 | |

N/M – Not meaningful

¹ References provide the mapping of regulatory balance sheet items used to calculate regulatory capital as reflected in the column "References" in the section "EU L1 – Differences between accounting and regulatory scopes of consolidation and the mapping of financial statement categories with regulatory risk categories". Where applicable, more detailed information are provided in the respective reference footnote section.

² Based on EBA list as referred to in Article 26 (3) CRR.

³ No interim profits to be recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4).

⁴ The € 1.5 billion additional value adjustments were derived from the EBA Regulatory Technical Standard on prudent valuation and are before consideration of a benefit from the related reduction of the shortfall of provisions to expected losses of € 45 million.

⁵ Based on Article 159 CRR and recent guidance provided by EBA (Q&A 2017_3426) published on January 18, 2019 only unearned credit spread additional value adjustments are used as specific credit risk adjustments.

⁶ Gains and losses on liabilities of the institution that are valued at fair value that result from changes in the own credit standing of the institution according to Article 33 (1) (b) CRR as well as all fair value gains and losses arising from the institution's own credit risk related to derivative liabilities according to Article 33 (1) (c) CRR.

⁷ Excludes holdings that are already considered in the accounting base of Common Equity.

⁸ Based on our current interpretation no deduction amount expected.

⁹ Prudential filter for fund for home loans and savings protection ("Fonds zur baupartechnischen Absicherung").

¹⁰ Amortization is taken into account.

¹¹ Includes Pillar 2 Requirement. June 2018 comparatives have been revised accordingly.

¹² Calculated as the CET 1 capital less any CET 1 items used to meet Tier 1 and Total capital requirements.

^A Common shares, additional paid-in capital and common shares in treasury reflect regulatory eligible CET 1 capital instruments.

^B The position retained earnings in the regulatory balance sheet includes net income (loss) attributable to Deutsche Bank shareholders and additional equity components of € 267 million (June 2018: € 481 million). This item is excluded from the position retained earnings in the transitional template for regulatory capital and shown separately along with accrual for dividend and AT1 coupons of € (267) million (June 2018: € (481) million) in the position independently reviewed interim profits net of any foreseeable charge or dividend.

^C Difference to regulatory balance sheet position driven by prudential filters for unrealized gains and losses.

^D Phase-out of minority interests (i.e. noncontrolling interests) at a rate of 0 % in 2018.

^E Regulatory applicable amount is goodwill and other intangible assets of € 8,947 million (June 2018: € 8,791 million) plus goodwill from equity method investments of € 69 million (June 2018: € 63 million) as per regulatory balance sheet reduced by deferred tax liabilities on other intangibles of € 450 million (June 2018: € 355 million). Total CET 1 deduction amount is phased-in at a rate of 100 % in 2018. Residual amount is deducted from AT1 capital.

^F Differences to balance sheet position mainly driven by adjustments as set out in Article 38 (2) to (5) CRR (e.g. regulatory offsetting requirements).

^G Phase-in at a rate of 100 % in 2018.

^H Additional equity components reflects regulatory eligible AT1 capital instruments.

^I Difference to regulatory balance sheet driven by regulatory adjustments as set out in Articles 51 to 61 CRR (e.g. current cap on AT1 instruments subject to phase-out arrangements).

^J Difference to regulatory balance sheet driven by regulatory adjustments as set out in Articles 62 to 71 CRR (e.g. maturity deduction, noncontrolling interests).

Reconciliation of shareholders' equity to regulatory capital

| in € m. | Dec 31, 2018 CRR/CRD 4 | Jun 30, 2018 CRR/CRD 4 |
|---|---------------------------|---------------------------|
| Total shareholders' equity per accounting balance sheet¹ | 62,495 | 62,656 |
| Deconsolidation/Consolidation of entities | (33) | (20) |
| of which: | | |
| Additional paid-in capital | (12) | (9) |
| Retained earnings | (150) | (144) |
| Accumulated other comprehensive income (loss), net of tax | 130 | 134 |
| Total shareholders' equity per regulatory balance sheet | 62,462 | 62,637 |
| Minority Interests (amount allowed in consolidated CET 1) ¹ | 846 | 861 |
| Accrual for dividend and AT1 coupons ² | (267) | (481) |
| Reversal of deconsolidation/consolidation of the position Accumulated other comprehensive income (loss), net of tax, during transitional period | 0 | 0 |
| Common Equity Tier 1 (CET 1) capital before regulatory adjustments | 63,041 | 63,016 |
| Prudential filters | (1,833) | (1,678) |
| of which: | | |
| Additional value adjustments | (1,504) | (1,214) |
| Any increase in equity that results from securitized assets | (1) | 0 |
| Fair value reserves related to gains or losses on cash flow hedges and gains or losses on liabilities designated at fair value resulting from changes in own credit standing | (329) | (463) |
| Regulatory adjustments relating to unrealized gains and losses pursuant to Art. 467 and 468 CRR | 0 | 0 |
| Regulatory adjustments | (13,722) | (13,456) |
| of which: | | |
| Goodwill and other intangible assets (net of related tax liabilities) | (8,566) | (8,500) |
| Deferred tax assets that rely on future profitability | (2,758) | (2,865) |
| Negative amounts resulting from the calculation of expected loss amounts | (367) | (191) |
| Defined benefit pension fund assets | (1,111) | (1,043) |
| Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities | 0 | 0 |
| Securitization positions not included in risk-weighted assets | 0 | 0 |
| Other | (920) | (857) |
| Common Equity Tier 1 capital | 47,486 | 47,884 |
| Additional Tier 1 capital | 7,604 | 7,568 |
| Additional Tier 1 Notes (AT1 Notes) | 4,595 | 4,596 |
| Per balance sheet | 4,675 | 4,675 |
| Deconsolidation/Consolidation of entities | 0 | 0 |
| Regulatory adjustments to balance sheet position | (79) | (80) |
| Hybrid capital securities | 3,009 | 2,973 |
| Per balance sheet | 3,168 | 3,143 |
| Deconsolidation/Consolidation of entities | 0 | 0 |
| Regulatory adjustments to balance sheet position | (159) | (170) |
| Other regulatory adjustments | 0 | 0 |
| Deductions from Additional Tier 1 capital | 0 | 0 |
| Tier 1 capital | 55,091 | 55,452 |
| Tier 2 capital | 6,202 | 6,260 |
| Subordinated debt | 5,918 | 5,980 |
| Per balance sheet | 7,144 | 7,358 |
| Deconsolidation/Consolidation of entities | 0 | 0 |
| Regulatory adjustments to balance sheet position | (1,226) | (1,378) |
| of which: | | |
| Amortization according to Art. 64 CRR | (801) | (724) |
| Other | (425) | (654) |
| Other regulatory adjustments | 284 | 280 |
| Deductions from Tier 2 capital | 0 | 0 |
| Total capital | 61,292 | 61,712 |

¹ Our IPO of DWS led to a € 0.9 billion CET 1 contribution which is reflected in the 'Total shareholders' equity per accounting balance sheet' at € 0.1 billion and 'Minority interests' at € 0.8 billion.

² No interim profits to be recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4).

Development of regulatory capital

| in € m. | six months ended Dec 31, 2018 CRR/CRD 4 | six months ended Jun 30, 2018 CRR/CRD 4 |
|---|--|--|
| Common Equity Tier 1 (CET 1) capital - opening amount | 47,884 | 50,808 |
| Common shares, net effect | 0 | 0 |
| of which: | | |
| New shares issued (+) | 0 | 0 |
| Shares retired (-) | 0 | 0 |
| Additional paid-in capital | 108 | 219 |
| Retained earnings | (277) | (385) |
| of which: | | |
| Actuarial gains (losses) rel. to defined benefit plans, net of tax and Currency Translation Adjustment (CTA) | (56) | (129) |
| Net income attributable to Deutsche Bank Shareholders | (214) | 481 |
| Common shares in treasury, net effect/(+) sales (-) purchase | 60 | (67) |
| Movements in accumulated other comprehensive income | (67) | (67) |
| of which: | | |
| Foreign currency translation, net of tax | 136 | 319 |
| Unrealized gains and losses | (197) | (370) |
| Other | (5) | (17) |
| Accrual for dividend and Additional Tier 1 (AT1) coupons ¹ | 214 | (481) |
| of which: | | |
| Gross dividends (deduction) | 378 | (427) |
| Shares issued in lieu of dividends (add back) | 0 | 0 |
| Gross AT1 coupons (deduction) | (163) | (54) |
| Additional value adjustments | (290) | (10) |
| Goodwill and other intangible assets (net of related tax liabilities) | (66) | (1,784) |
| Deferred tax assets that rely on future profitability (excluding those arising from temporary differences) | 107 | (462) |
| Negative amounts resulting from the calculation of expected loss amounts | (176) | 217 |
| Removal of gains/losses resulting from changes in own credit standing in liabilities designated at fair value (net of tax) | 134 | (393) |
| Defined benefit pension fund assets | (68) | (143) |
| Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities | 0 | 0 |
| Securitization positions not included in risk-weighted assets | 0 | 0 |
| Deferred tax assets arising from temporary differences (amount above 10 % and 15 % threshold, net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) | 0 | 0 |
| Other, including regulatory adjustments | (78) | 432 |
| Common Equity Tier 1 (CET 1) capital - closing amount | 47,486 | 47,884 |
| Additional Tier 1 (AT1) capital - opening amount | 7,568 | 6,823 |
| New Additional Tier 1 eligible capital issues | 0 | 0 |
| Matured and called instruments | 0 | (1,008) |
| Transitional arrangements | 0 | 1,730 |
| of which: | | |
| Amount excluded from Additional Tier 1 capital due to cap | 0 | 0 |
| Goodwill and other intangible assets (net of related tax liabilities) | 0 | 1,679 |
| Negative amounts resulting from the calculation of expected loss amounts | 0 | 51 |
| Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities | 0 | 0 |
| Other, including regulatory adjustments | 36 | 23 |
| Additional Tier 1 (AT1) capital - closing amount | 7,604 | 7,568 |
| Tier 1 capital (T1 = CET 1 + AT1) | 55,091 | 55,452 |
| Tier 2 (T2) capital - opening amount | 6,260 | 6,384 |
| New Tier 2 eligible capital issues | 0 | 0 |
| Matured and called instruments | (3) | (157) |
| Amortization adjustments | (127) | (111) |
| Transitional arrangements | 0 | 51 |
| of which: | | |
| Inclusion of amount excluded from Additional Tier 1 capital due to cap | 0 | 0 |
| Amount to be deducted from or added to Additional Tier 2 capital with regard to additional filters and deductions required pre-CRR | 0 | 0 |
| Negative amounts resulting from the calculation of expected loss amounts | 0 | 51 |
| Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities | 0 | 0 |
| Other, including regulatory adjustments | 72 | 92 |
| Tier 2 (T2) capital - closing amount | 6,202 | 6,260 |
| Total regulatory capital (TC = T1 + T2) | 61,292 | 61,712 |

¹ No interim profits to be recognized as per ECB Decision (EU) 2015/656 in accordance with the Article 26(2) of Regulation (EU) No 575/2013 (ECB/2015/4).

Article 437 (1)(b-c) CRR - Main features of capital instruments

A description of the main features of the Common Equity Tier 1, Additional Tier 1 and Tier 2 capital instruments issued by Deutsche Bank is published on Deutsche Bank's website (db.com/ir/en/capital-instruments.htm). In addition, this website provides full terms and conditions of all Common Equity Tier 1, Additional Tier 1 and Tier 2 capital instruments.

Article 437 (1)(f) CRR - Capital ratios different to CRR

The own funds capital ratios provided for Deutsche Bank Group are built upon the CRR regulations.

Capital requirements

Article 438 (a) CRR - Summary of Deutsche Bank's ICAAP approach

Deutsche Bank's internal capital adequacy assessment process ("ICAAP") consists of several well established components which ensure that the Group maintains sufficient capital to cover the risks to which the bank is exposed on an ongoing basis:

- Risk identification and assessment: The risk identification process forms the basis of the ICAAP and results in an inventory of risks for the Group. All risks identified are assessed for their materiality.
- Capital demand/risk measurement: Risk measurement methodologies and models are applied to quantify the capital demand which is required to cover all material risks except for those which cannot be adequately limited by capital e.g. liquidity risk.
- Capital supply: Capital supply quantification refers to the definition of available capital resources to absorb unexpected losses quantified as part of the capital demand.
- Risk appetite: Deutsche Bank has established Group risk appetite thresholds which express the level of risk that we are willing to assume to achieve our strategic objectives. Threshold breaches are subject to a dedicated governance framework triggering management actions aimed to safeguard capital adequacy.
- Capital planning: The risk appetite thresholds for capital adequacy metrics constitute boundaries which have to be met to safeguard capital adequacy on a forward-looking basis.
- Stress testing: Capital plan figures are also considered under various stress test scenarios to prove resilience and overall viability of the bank. Capital adequacy metrics are also subject to regular stress tests throughout the year to constantly evaluate Deutsche Bank's capital position in hypothetical stress scenarios and to detect vulnerabilities under stress.
- Capital adequacy assessment: Although capital adequacy is constantly monitored throughout the year, the ICAAP concludes with a dedicated annual capital adequacy assessment (CAS). The assessment consists of a Management Board statement about Deutsche Bank's capital adequacy, which is linked to specific conclusions and management actions to be taken to safeguard capital adequacy on a forward-looking basis.

As part of its ICAAP, Deutsche Bank distinguishes between a normative and economic internal perspective. The normative internal perspective refers to an internal process aimed at the fulfilment of all capital-related legal requirements and supervisory demands on an ongoing basis. The economic internal perspective refers to an internal process aimed at capital adequacy using internal economic capital demand models and an internal economic capital supply definition. Both perspectives focus on maintaining the viability of Deutsche Bank on an ongoing basis.

For a further description of the above ICAAP components, please refer to the Annual Report 2018 under sections "Risk identification and assessment" on page 61, "Risk profile" on page 48, "Capital, Leverage Ratio and MREL" on page 90, "Risk appetite and capacity" on page 54, "Key risk metrics" on pages 46, "Strategic and capital plan" on page 54, and "Stress testing" on page 56. Additionally, the following sections below on pages 31-34 in this report describe the risk measurement methodologies (economic capital models) applied by Deutsche Bank to quantify capital demand required to cover all material risks.

Credit risk economic capital model

We calculate economic capital for counterparty risk, transfer risk and settlement risk as elements of credit risk. In line with our economic capital framework, economic capital for credit risk is set at a level to absorb with a probability of 99.9 % very severe aggregate unexpected losses within one year.

Our economic capital for credit risk is derived from the loss distribution of a portfolio via Monte Carlo Simulation of correlated rating migrations. The portfolio loss distribution is calculated as follows: in a first step, potential credit losses are quantified on transactional level based on available exposure and loss-given-default information. In a second step, the probability of joint defaults is modeled stochastically in terms of risk factors representing the relevant countries and industries that the counterparties are linked to. The simulation of portfolio losses is then performed by an internally developed model, which takes rating migration and maturity effects into account. Effects due to wrong-way derivatives risk (i.e., the credit exposure of a derivative in the default case is higher than in nondefault scenarios) are modeled by applying our own alpha factor when deriving the exposure at default for derivatives and securities financing transactions under the Basel 3 Internal Models Method ("IMM"). We allocate expected losses and economic capital derived from loss distributions down to transaction level to enable management on transaction, customer and business level.

Our asset value credit portfolio model is based on the assumption that an obligor firm defaults when its value is no longer high enough to cover its liabilities. The obligor's asset value or "ability to pay" is modeled as a random process, the Ability to Pay Process (APP). An obligor is taken to default when its asset value or ability to pay falls below a given default point. Changes in the value of systematic and specific factors are simulated in terms of multivariate distributions. The weight assigned to systematic and specific components and the covariance of systematic factors are estimated using equity and rating time series or are based on standard settings for particular portfolio segments.

Modeling correlations via a factor model: A factor model describes the dynamics of a large number of random variables by making use of a reduced and fixed number of other random variables, called factors. The approach has the advantage of reducing computing time: fewer correlations need to be evaluated, and the factor correlation matrix does not change when new obligors are introduced. The parameters that specify the factor model are:

- The factor model characteristics for the different borrowers, i.e., the weights for the systematic country and industry factors (our model uses 37 systematic factors) and the R^2 , which determines the weight for the specific factor
- The covariance matrix between the country and industry factors

Modeling rating migration: The rating migration methodology requires additional information, namely yield curves and transition matrices describing the probabilities of migrating between different credit ratings.

- Migration matrix: For K non-default credit rating grades and 1 default credit rating, a migration matrix is a $(K + 1) \times (K + 1)$ matrix with entries π_{ij} . It expresses in percentage terms the probability π_{ij} that any borrower with the credit rating i moves to the credit rating j in the next time step.
- Risk-free curve: The risk-free curve required as an input for different points in time is used to derive the corresponding risk-free discount factors.

Economic capital is derived from Value-at-Risk (VaR) with confidence level $\alpha = 99.9\%$. The economic capital is allocated to individual transactions using expected shortfall allocation. Portfolio information includes exposure, loss given default, one-year default probability and maturity. The parameters are consistent with the parameters used for the regulatory reporting, with the exception of those from the exposure for derivatives.

Market risk economic capital model

Economic capital for market risk measures the amount of capital needed to absorb very severe, unexpected losses arising from our exposures over the period of one year. "Very severe" in this context means that the underlying economic capital is set at a level which covers, with a probability of 99.9%, all unexpected losses over a one year time horizon. Market Risk Economic Capital consists of the following three components:

- Traded Market Risk, capturing the risk due to valuation changes from market price movements
- Traded Default Risk, capturing the risk due to valuation changes caused by issuer default and migration risk
- Non-traded Market Risk, market risk arising outside of the core trading activities

Traded market risk economic capital ("TMR EC")

Our traded market risk economic capital model - scaled Stressed VaR based EC (SVaR based EC) - comprises two core components, the "common risk" component covering risk drivers across all businesses and the "business-specific risk" component, which enriches the Common Risk via a suite of Business Specific Stress Tests (BSSTs). Both components are calibrated to historically-observed severe market shocks.

Common risk is calculated using a scaled version of the Regulatory SVaR framework. The SVaR measure itself replicates the Value-at-Risk calculation that would be generated on the bank's current portfolio if the relevant market factors were experiencing a period of stress. In particular, the model inputs are calibrated to historical data from a continuous 12-month period of significant financial stress relevant to the bank's portfolio. The Regulatory SVaR model is then scaled-up to cover a different liquidity horizon (up to 1 year) and confidence level (99.9%). The liquidity horizon framework that is utilized in the SVaR based EC model accounts for different levels of market liquidity as well as risk concentrations in the bank's portfolios. In terms of coverage, the "common risk" captures outright linear and some non-linear risks (e.g. Gamma, Vega etc) to systematic and idiosyncratic risk drivers. The model incorporates the following risk factors: interest rates, credit spreads, equity prices, foreign exchange rates, commodity prices, volatilities and correlations.

The "business-specific risk" captures more product/business-related bespoke risks (e.g. complex basis risks) as well as higher order risks (e.g. for equity options) not captured in the common risk component. The concept of business-specific risk is in particular important in areas where the lack of meaningful market data prevents direct use of the common risk model. BSSTs are in general calibrated to available historical data to obtain a stress scenario. Where appropriate, risk managers use their expert judgment to define severe market shocks, based upon the knowledge of past extreme market conditions. In addition to

the BSSTs the business specific risk component of the SVaR based EC model also contains placeholders which carry an estimated EC component on a temporary basis, while efforts are being made to cover those risks with a proper business-specific stress test or integrate it in the common risk framework.

We also continuously assess and refine our market risk EC model to ensure the capture of new material risks as well as the appropriateness of the shocks applied. The calculation of the Traded Market Risk EC is performed weekly.

Traded default risk economic capital ("TDR EC")

TDR refers to changes in the value of instruments caused by default or rating changes of the issuer. For credit derivatives like credit default swaps (CDS), the rating of the issuer of the reference asset is modeled. TDR covers the following positions:

- Fair value assets in the banking book;
- Unsecuritized credit products in the trading book;
- Securitized products in the trading book.

The TDR methodology is similar to the credit risk methodology. An important difference between the EC calculation for traded default risk and credit risk is the capital horizon of 6 months which is used for most TDR positions compared to 12 months used for credit risk. Recognizing traded default risk EC for unsecuritized credit products corresponds to the calculation of the incremental risk charge for the trading book for regulatory purposes. EC for TDR represents an estimate of the default and migration risks of credit products at a 99.9 % confidence level, taking into account the liquidity horizons of the respective sub-portfolios.

TDR EC captures the relevant credit exposures across our trading and banking books. Trading book exposures are monitored by market risk management via single name concentration and portfolio thresholds which are set based upon rating, size and liquidity. Single name concentration risk thresholds are set for two key metrics: Default Exposure, i.e., the P&L impact of an instantaneous default at the current recovery rate (RR), and bond equivalent Market Value (MV), i.e. default exposure at 0 % recovery. In order to capture diversification and concentration effects we perform a joint calculation for traded default risk economic capital and credit risk economic capital. Important parameters for the calculation of traded default risk are exposures, recovery rates and default probabilities as well as maturities. Exposures, recovery rates and default probabilities are derived from market information and external ratings for trading book positions or from internal assessments for the banking book positions as for credit risk economic capital. Rating migrations are governed by issuer type specific migration matrices, which are obtained from historical rating time series from rating agencies and internal observations. The probability of joint rating downgrades and defaults is determined by the default and rating correlations of the portfolio model. These correlations are specified through systematic factors that represent countries, geographical regions and industries.

Non-traded market risk economic capital ("NTMR EC")

Non-traded market risk arises from market movements, primarily outside the activities of our trading units, in our banking book and from off-balance sheet items. Significant market risk factors which the bank is exposed to and are overseen by risk management groups in that area are:

- Interest rate risk (including risk from embedded optionality and changes in behavioral patterns for relevant product types), credit spread risk, foreign exchange risk, equity risk (including investments in public and private equity as well as real estate, infrastructure and fund assets); and
- Market risks from off-balance sheet items such as pension schemes and guarantees as well as structural foreign exchange risk and equity compensation risk.

Non-traded market risk economic capital is being calculated either by applying the standard traded market risk EC methodology (SVaR based EC model) or through the use of non-traded market risk models that are specific to each risk class and which consider, among other factors, large historically observed market moves, the liquidity of each asset class, and changes in client's behavior in relation to products with behavioral optionalities. The calculation of EC for non-traded market risk is performed monthly.

An independent model validation team reviews all quantitative aspects of our MR EC model on a regular basis. The review covers, but is not limited to, model assumptions and calibration approaches for risk parameters.

Operational risk economic capital model

For the quantification of economic capital requirements the Group uses the Advanced Measurement Approach ("AMA"). The economic capital is set at a 99.9 % percentile to absorb very severe unexpected losses within one year. Since the fourth quarter of 2017 we apply the same confidence levels for the calculation of regulatory and economic capital requirements as

described in chapter "Capital, Leverage Ratio and MREL", section "Internal capital adequacy" in the 2018 Annual Report on page 99.

For detailed information on our Operational risk measurement approaches refer to our Pillar 3 report section "Article 446 CRR - Operational risk measurement" on page 149.

Business risk economic capital model

We measure economic capital for business risk, which includes strategic risk and tax risk.

The economic capital for strategic risk is based on a model calculating an earnings distribution on Deutsche Bank group level. Important input parameters of the EC model are planned revenues and costs from the Group strategic plan and monthly forecast process on business unit level. This ensures that the model includes strategic decisions or changes to the business environment in a timely manner. These forecasts determine the mean values of the revenue and cost distributions. The volatilities of the revenue distributions are derived from historical revenue time series of our business units. Risk concentrations within and across businesses are specified by revenue drivers for individual business units. The correlations of revenue drivers, e.g. market or macroeconomic factors, are calibrated with historical time series. Revenues are then simulated together with costs to allow for a partial offset of revenue decreases by cost reductions, e.g. by reduced bonus payments. Revenues and costs are combined to an earnings distribution for the Group, which is used for deriving the economic capital for strategic risk. Strategic risk EC is held to protect against operating income losses covering a twelve months time-horizon and is calculated with a confidence of 99.9 %, in line with our general economic capital definition.

Tax risk is determined by reference to corporate income tax re-determination risk with respect to transactions undertaken by the Bank. Tax re-determination risk is the risk that the eventual tax treatment of a transaction differs from that initially determined by the Bank because of a judicial determination or a compromise by the Bank with a tax authority. Examples of tax re-determination risk include a tax ceasing to be creditable, taxable income being treated as arising, a tax deduction not being granted, a tax consolidated group not being respected, or an anti avoidance rule being determined to apply. Tax related inputs of the process are under the direction and control of tax professionals of the Bank who are independent of business units. The calculation of tax risk EC is performed in a portfolio model which incorporates issues with a one year time horizon. The notional exposure for each "tax issue" is determined and is then modified for reserves and a settlement adjustment. A probability is assigned to each "tax issue". Tax risk EC is computed at the 99.9 % confidence level of the portfolio loss distribution, which is obtained through Monte Carlo simulation.

Risk type diversification

The risk type diversification benefit quantifies diversification effects between credit, market, operational and strategic risk in the economic capital calculation caused by non-perfect correlations between these risk types. The calculation of the risk type diversification benefit is intended to ensure that the standalone economic capital figures for the individual risk types are aggregated in an economically meaningful way. Please refer to section "Risk profile" on page 48 in our Annual Report 2018 for the diversification amount across credit risk, market risk, operational risk and business risk.

Stress testing

Deutsche Bank is subject to stress test exercises to satisfy both internal as well as externally imposed stress test requirements. The internal stress tests are based on in-house developed methods and inform a variety of risk management use cases such as our risk appetite framework or capital allocation. The regulatory stress tests, e.g. the EBA stress test and the US-based CCAR (Comprehensive Capital Analysis and Review) stress tests are strictly following the processes and methodologies as prescribed by the regulatory authorities.

Our internal stress tests are performed on a regular basis in order to assess the impact of a severe economic downturn on our risk profile and financial position. These exercises complement traditional risk measures and represent an integral part of our strategic and capital planning process. Our stress testing framework comprises regular Group-wide stress tests based on internally defined scenarios of different severities and localizations. We include all material risk types into our stress testing exercises. The time-horizon of internal stress tests is generally one year and can be extended to multi-year, if required by the scenario assumptions. Our methodologies undergo regular scrutiny from Deutsche Bank's internal validation team (Model Risk Management) whether they correctly capture the impact of a given stress scenario. These analyses are complemented by portfolio- and country-specific stress tests as well as regulatory requirements, such as annual reverse stress tests and additional stress tests requested by our regulators on group or legal entity level. Moreover, capital plan stress testing is performed to assess the viability of our capital plan in adverse circumstances and to demonstrate a clear link between risk appetite, business strategy, capital plan and stress testing. An integrated procedure allows us to assess the impact of ad-hoc scenarios that simulate potential imminent financial or geopolitical shocks.

The initial phase of our internal stress tests consists of defining a macroeconomic downturn scenario by ERM Risk Research in cooperation with business specialists. ERM Risk Research monitors the political and economic development around the world and maintains a macro-economic heat map that identifies potentially harmful scenarios. Based on quantitative models and expert judgments, economic parameters such as foreign exchange rates, interest rates, GDP growth or unemployment rates are set accordingly to reflect the impact on our business. The scenario parameters are translated into specific risk drivers by subject matter experts in the risk units. Based on our internal models framework for stress testing, the following major metrics are calculated under stress: risk-weighted assets, impacts on profit and loss and economic capital by risk type. These results are aggregated at the Group level, and key metrics such as the CET 1 ratio, ECA ratio and Leverage Ratio under stress are derived. Stress impacts on the Liquidity Coverage Ratio (LCR) and the Liquidity Reserve are also considered. Prior to the impact assessment the more severe scenarios are discussed and approved by the Enterprise Risk Committee (ERC) which also reviews the final stress results. After comparing these results against our defined risk appetite, the ERC also discusses specific mitigation actions to remediate the stress impact in alignment with the overall strategic and capital plan if certain limits are breached. The results also feed into the recovery planning which is crucial for the recoverability of the Bank in times of crisis. The outcome is presented to senior management up to the Management Board to raise awareness on the highest level as it provides key insights into specific business vulnerabilities and contributes to the overall risk profile assessment of the bank. The group wide stress tests performed in 2018 indicated that the bank's capitalization together with available mitigation measures allow it to reach the internally set stress exit level, the latter being above regulatory early intervention levels. A reverse stress test is performed annually in order to challenge our business model by determining scenarios which would cause us to become unviable. Such a reverse stress test is based on a hypothetical macroeconomic scenario enriched by idiosyncratic events based on the top risks monitored by each risk type. Comparing the hypothetical scenario resulting in the Bank's non-viability to the current economic environment, we consider the probability of occurrence of such a hypothetical stress scenario as extremely low. Given this, we do not believe that our business continuity is at risk.

Deutsche Bank also took part in two major regulatory stress tests performed in 2018, i.e. the biannual European EBA stress test as well as the US-based CCAR stress test. In the US, DB USA Corporation received no Federal Reserve (FRB) objections to its quantitative capital plan given its ample capital and liquidity under the stressed scenario. The entity, however, received a qualitative objection to the CCAR 2018 capital plan for weaknesses in governance, model methodology, validation, data and infrastructure.

The EBA stress test exercise 2018 was based on the newly introduced IFRS 9 accounting framework and did not prescribe any pass/fail threshold for the projected CET 1 and Leverage ratios under the macroeconomic base and adverse scenario.

Article 438 (b) CRR - SREP requirements

The SREP requirements are described further below in this Report in section "Article 440 CCR - Capital buffers" on page 38 as well as in the Annual Report 2018 under chapter "Capital, Leverage Ratio and MREL", section "Minimum capital requirements and additional capital buffers" on page 91.

Article 438 (c-f) CRR - Overview of capital requirements

The table below shows RWA and regulatory capital requirements broken down by risk types and model approaches compared to the previous quarter-end.

EU OV1 – Overview of RWA

| | | Dec 31, 2018 | | Sep 30, 2018 | |
|----------------------|-----------|--------------|------------------------------|--------------|------------------------------|
| | | a1 | b1 | a2 | b2 |
| in € m. | | RWA | Minimum capital requirements | RWA | Minimum capital requirements |
| | 1 | 165,445 | 13,236 | 163,444 | 13,076 |
| | of which: | | | | |
| Art 438(c)(d) | 2 | 18,315 | 1,465 | 18,828 | 1,506 |
| Art 438(c)(d) | 3 | 3,709 | 297 | 3,638 | 291 |
| Art 438(c)(d) | 4 | 136,192 | 10,895 | 134,371 | 10,750 |
| Art 438(d) | 5 | 7,229 | 578 | 6,606 | 529 |
| Art 107 | 6 | | | | |
| Art 438(c)(d) | 6 | 33,052 | 2,644 | 36,117 | 2,889 |
| | of which: | | | | |
| Art 438(c)(d) | 7 | 3,912 | 313 | 5,375 | 430 |
| Art 438(c)(d) | 8 | 0 | 0 | 0 | 0 |
| | 9 | 0 | 0 | 0 | 0 |
| | 9a | 2,688 | 215 | 2,226 | 178 |
| | 10 | 18,077 | 1,446 | 18,714 | 1,497 |
| Art 438(c)(d) | 11 | 380 | 30 | 615 | 49 |
| Art 438(c)(d) | 12 | 7,997 | 640 | 9,187 | 735 |
| Art 438(e) | 13 | 86 | 7 | 53 | 4 |
| Art 449(o)(i) | 14 | 9,253 | 740 | 8,369 | 669 |
| | of which: | | | | |
| | 15 | 8,041 | 643 | 7,530 | 602 |
| | of which: | | | | |
| | 16 | 6,059 | 485 | 5,543 | 443 |
| | 17 | 0 | 0 | 0 | 0 |
| | 18 | 1,212 | 97 | 838 | 67 |
| | 19 | 37,535 | 3,003 | 30,219 | 2,418 |
| | of which: | | | | |
| | 20 | 5,673 | 454 | 4,824 | 386 |
| | 21 | 31,862 | 2,549 | 25,395 | 2,032 |
| Art 438(e) | 22 | 0 | 0 | 0 | 0 |
| Art 438(f) | 23 | 91,989 | 7,359 | 90,846 | 7,268 |
| | of which: | | | | |
| | 24 | 0 | 0 | 0 | 0 |
| | 25 | 0 | 0 | 0 | 0 |
| | 26 | 91,989 | 7,359 | 90,846 | 7,268 |
| Art 437(2), 48,60 | 27 | 13,073 | 1,046 | 12,677 | 1,014 |
| Art 500 | 28 | 0 | 0 | 0 | 0 |
| | 29 | 350,432 | 28,035 | 341,725 | 27,338 |

The RWA according to CRR/CRD 4 fully-loaded were € 350.4 billion as of December 31, 2018, compared to € 341.7 billion as of September 30, 2018. The increase of € 8.7 billion is mainly driven by market risk RWA due to an increase in risk levels stemming from the incremental risk charge and stressed value-at-risk components. Furthermore operational risk RWA contributed to the overall increase and was driven by an update of our internal and external loss profile. The increase in credit risk RWA (excl. counterparty credit risk) primarily results from business growth in our Corporate & Investment Bank. Additionally the RWA for securitizations in the banking book rose up due to increased exposures. This increase was partly offset by reductions in counterparty credit risk RWA resulting from deleveraging activities in non-strategic businesses as well as improved processes.

The movements of RWA for the specific risk types are discussed further down in this report for credit risk in section "Article 438 (d) CRR - Development of credit risk RWA" on page 99, for counterparty credit risk in section "Article 438 (d) CRR - Development of CCR RWA" on page 136 and for market risk in section "Article 455 (e) CRR - Regulatory capital requirements for market risk" on page 145.

Article 438 CRR - Specialized lending and equity exposures in the banking book

The table below summarizes our foundation approach exposure for specialized lending on an EAD basis. For the calculation of minimum capital requirements regulatory risk weights are applied where potential risk mitigating factors are already considered in the assignment of a risk weight to a specific structure. Additional credit risk mitigation techniques have not been applied.

For specific exposures in the advanced IRBA we are required to apply regulatory defined risk weights. In the following section we summarize our IRBA exposures for equities and other non-credit obligation assets falling under this requirement. Credit risk mitigation techniques have not been applied.

EU CR10 – IRB (specialized lending and equities)

| in € m. (unless stated otherwise) | | Dec 31, 2018 | | | | | |
|--------------------------------------|---------------------------------|-------------------------|--------------------------|-------------|-----------------|------------|-----------------|
| Specialized lending | | | | | | | |
| Regulatory categories | Remaining maturity | On-balance sheet amount | Off-balance sheet amount | Risk weight | Exposure amount | RWA | Expected losses |
| Category 1 | Less than 2.5 years | 235 | 93 | 50 % | 307 | 153 | 0 |
| | Equal to or more than 2.5 years | 800 | 87 | 70 % | 919 | 643 | 3 |
| Category 2 | Less than 2.5 years | 38 | 39 | 70 % | 66 | 46 | 0 |
| | Equal to or more than 2.5 years | 94 | 89 | 90 % | 137 | 124 | 1 |
| Category 3 | Less than 2.5 years | 1 | 0 | 115 % | 2 | 3 | 0 |
| | Equal to or more than 2.5 years | 28 | 0 | 115 % | 30 | 34 | 1 |
| Category 4 | Less than 2.5 years | 8 | 0 | 250 % | 8 | 19 | 1 |
| | Equal to or more than 2.5 years | 8 | 0 | 250 % | 9 | 21 | 1 |
| Category 5 | Less than 2.5 years | 3 | 0 | – | 10 | 0 | 5 |
| | Equal to or more than 2.5 years | 15 | 0 | – | 19 | 0 | 10 |
| Total | Less than 2.5 years | 285 | 132 | – | 392 | 221 | 6 |
| | Equal to or more than 2.5 years | 946 | 177 | – | 1,114 | 822 | 16 |

| Equities under the simple risk-weighted approach | | | | | | | |
|---|--|-------------------------|--------------------------|-------------|-----------------|--------------|----------------------|
| Categories | | On-balance sheet amount | Off-balance sheet amount | Risk weight | Exposure amount | RWA | Capital requirements |
| Private equity exposures sufficiently diversified | | 450 | 0 | 190 % | 450 | 855 | 68 |
| Exchange-traded equity exposures | | 166 | 0 | 290 % | 166 | 482 | 39 |
| All other equity exposures | | 1,544 | 48 | 370 % | 1,593 | 5,893 | 471 |
| Total | | 2,160 | 48 | – | 2,209 | 7,229 | 578 |

| in € m. (unless stated otherwise) | | Jun 30, 2018 | | | | | |
|--------------------------------------|---------------------------------|-------------------------|--------------------------|-------------|-----------------|------------|-----------------|
| Specialized lending | | | | | | | |
| Regulatory categories | Remaining maturity | On-balance sheet amount | Off-balance sheet amount | Risk weight | Exposure amount | RWA | Expected losses |
| Category 1 | Less than 2.5 years | 89 | 11 | 50 % | 99 | 49 | 0 |
| | Equal to or more than 2.5 years | 923 | 152 | 70 % | 1,080 | 756 | 4 |
| Category 2 | Less than 2.5 years | 30 | 9 | 70 % | 36 | 25 | 0 |
| | Equal to or more than 2.5 years | 111 | 88 | 90 % | 178 | 160 | 1 |
| Category 3 | Less than 2.5 years | 2 | 0 | 115 % | 3 | 3 | 0 |
| | Equal to or more than 2.5 years | 30 | 1 | 115 % | 31 | 36 | 1 |
| Category 4 | Less than 2.5 years | 8 | 0 | 250 % | 7 | 19 | 1 |
| | Equal to or more than 2.5 years | 6 | 0 | 250 % | 7 | 17 | 1 |
| Category 5 | Less than 2.5 years | 9 | 0 | – | 9 | 0 | 5 |
| | Equal to or more than 2.5 years | 24 | 0 | – | 24 | 0 | 12 |
| Total | Less than 2.5 years | 138 | 20 | – | 155 | 97 | 6 |
| | Equal to or more than 2.5 years | 1,095 | 240 | – | 1,320 | 969 | 19 |

| Equities under the simple risk-weighted approach | | | | | | | |
|---|--|-------------------------|--------------------------|-------------|-----------------|--------------|----------------------|
| Categories | | On-balance sheet amount | Off-balance sheet amount | Risk weight | Exposure amount | RWA | Capital requirements |
| Private equity exposures sufficiently diversified | | 425 | 8 | 190 % | 433 | 822 | 66 |
| Exchange-traded equity exposures | | 4 | 119 | 290 % | 122 | 354 | 28 |
| All other equity exposures | | 1,369 | 56 | 370 % | 1,424 | 5,270 | 422 |
| Total¹ | | 1,797 | 182 | – | 1,979 | 6,447 | 516 |

Article 438 CRR - Other non-credit obligation assets in the banking book

The table below presents the exposures assigned to the exposure class “other non-credit obligation assets” as outlined in Article 156 CRR. We split the table into cash positions in accordance with Article 156 (a) CRR, which receive a risk weight of 0 % as well as other positions receiving a risk weight of 100 %. Additional credit risk mitigation techniques have not been applied.

Credit risk exposures of other non-credit obligation assets

| in € m. | Risk Weight | Dec 31, 2018 | | Jun 30, 2018 | |
|---|-------------|--------------|--------------|--------------|--------------|
| | | EAD | RWA | EAD | RWA |
| Risk Position | | | | | |
| Other non-credit obligation assets - cash | 0 % | 2,828 | 0 | 2,762 | 0 |
| Other non-credit obligation assets - other | 100 % | 3,276 | 3,276 | 4,511 | 4,511 |
| Total EAD other non-credit obligation assets | – | 6,104 | 3,276 | 7,273 | 4,511 |

Article 441 CRR - Indicators of global systemic importance

In March 2015, Deutsche Bank was designated as a Global Systemically Important Financial Institutions (G-SII) by the German Federal Financial Supervisory Authority (BaFin) in agreement with Deutsche Bundesbank resulting in a G-SII buffer requirement of 2.00 % CET 1 capital of RWA in 2019. This is in line with the Financial Stability Board (FSB) assessment of systemic importance based on the indicators they developed. The additional buffer requirement of 2.00 % for G-SIIs was phased in with 0.50 % in 2016, 1.00 % in 2017 and in 2018 amounts to 1.50 %. We will continue to publish our indicators on our website:

db.com/ir/en/regulatory-reporting.htm

Article 440 CRR - Capital buffers

Minimum capital requirements and additional capital buffers

The Pillar 1 CET 1 minimum capital requirement applicable to the Group is 4.50 % of risk-weighted assets (RWA). The Pillar 1 total capital requirement of 8.00 % demands further resources that may be met with up to 1.50 % Additional Tier 1 capital and up to 2.00 % Tier 2 capital.

Failure to meet minimum capital requirements can result in supervisory measures such as restrictions of profit distributions or limitations on certain businesses such as lending. We complied with the regulatory capital adequacy requirements in 2018.

In addition to these minimum capital requirements, the following combined capital buffer requirements have been phased in since 2016 (other than the systemic risk buffer, if any, which is not subject to any phase-in) and will become fully effective from 2019 onwards. The buffer requirements must be met in addition to the Pillar 1 minimum capital requirements, but can be drawn down in times of economic stress.

Deutsche Bank continues to be designated as a global systemically important institution (G-SII) by the German Federal Financial Supervisory Authority (BaFin) in agreement with the Deutsche Bundesbank, resulting in a G-SII buffer requirement of 2.00 % CET 1 capital of RWA in 2019 and was phased in with 0.5 % in 2016, 1.00 % in 2017 and 1.50 % in 2018. This is in line with the FSB assessment of systemic importance based on the indicators as published in 2018. We will continue to publish our indicators on our website.

The capital conservation buffer is implemented in Section 10c German Banking Act based on Article 129 CRD 4 and equals a requirement of 2.50 % CET 1 capital of RWA in 2019 and was phased in with 0.625 % in 2016, 1.25 % in 2017 and 1.875 % in 2018.

The countercyclical capital buffer is deployed in a jurisdiction when excess credit growth is associated with an increase in system-wide risk. It may vary between 0 % and 2.50 % CET 1 capital of RWA by 2019. In exceptional cases, it could also be higher than 2.50 %. The institution specific countercyclical buffer that applies to Deutsche Bank is the weighted average of the countercyclical capital buffers that apply in the jurisdictions where our relevant credit exposures are located. As per December 31, 2018, the institution-specific countercyclical capital buffer was at 0.07 %.

In addition to the aforementioned buffers, national authorities, such as the BaFin, may require a systemic risk buffer to prevent and mitigate long-term non-cyclical systemic or macro-prudential risks that are not covered by the CRR. They can require an additional buffer of up to 5.00 % CET 1 capital of RWA. As of the year-end 2018, no systemic risk buffer applied to Deutsche Bank.

Additionally, Deutsche Bank AG has been classified by BaFin as an other systemically important institution (O-SII) with an additional buffer requirement of 2.00 % that has to be met on a consolidated level. For Deutsche Bank, the O-SII buffer was introduced in first steps of 0.66 % in 2017, 1.32 % in 2018 and 2.00 % in 2019. Unless certain exceptions apply, only the

higher of the systemic risk buffer (as of December 31, 2018, not applicable), G-SII buffer and O-SII buffer must be applied. Accordingly, the O-SII buffer is not applicable as of December 31, 2018.

In addition, pursuant to the Pillar 2 Supervisory Review and Evaluation Process (SREP), the European Central Bank (ECB) may impose capital requirements on individual banks which are more stringent than statutory requirements (so-called Pillar 2 requirement). On December 19, 2017, Deutsche Bank was informed by the ECB of its decision regarding prudential minimum capital requirements for 2018, following the results of the 2017 SREP. Beginning from January 1, 2018, the decision requires Deutsche Bank to maintain a phase-in CET 1 ratio, which as of December 31, 2018 is at least 10.69 % on a consolidated basis. This requirement on CET 1 capital comprises the Pillar 1 minimum capital requirement of 4.50 %, the Pillar 2 requirement (SREP Add-on) of 2.75 %, the phase-in capital conservation buffer of 1.875 %, the countercyclical buffer of 0.07 % (as per December 31, 2018) and the phase-in G-SII capital buffer of 1.50 %. Correspondingly the requirements for Deutsche Bank's Tier 1 capital ratio were at 12.19 % and total capital ratio at 14.19 % as of December 31, 2018.

Beginning from January 1, 2019, Deutsche Bank must maintain a CET 1 ratio of at least 11.82 % on a consolidated basis as the transition period for the capital conservation buffer and the G-SII capital buffer requirements ended and the full buffer levels of 2.50 % and 2.00 %, respectively, need to be covered with CET 1 capital. To summarize, the CET 1 capital requirement comprises the Pillar 1 minimum capital requirement of 4.50 %, the unchanged Pillar 2 requirement (SREP Add-on) of 2.75 %, the capital conservation buffer of 2.50 %, the countercyclical buffer (0.07 % per year end 2018) and the G-SII buffer of 2.00 %. Correspondingly, 2019 requirements for Deutsche Bank's Tier 1 capital ratio are at 13.32 % and for its total capital ratio at 15.32 %. On February 8, 2019, Deutsche Bank was informed by the ECB of its decision regarding prudential minimum capital requirements for 2019, following the results of the 2018 SREP. The decision left Deutsche Bank's Pillar 2 requirement and thus the CET 1 capital requirements unchanged at 2.75 % beginning from March 1, 2019. Also, the ECB communicated to us an individual expectation to hold a further Pillar 2 CET 1 capital add-on, commonly referred to as the Pillar 2 guidance. The capital add-on pursuant to the Pillar 2 guidance is separate from and in addition to the Pillar 2 requirement. The ECB has stated that it expects banks to meet the Pillar 2 guidance although it is not legally binding, and failure to meet the Pillar 2 guidance does not lead to automatic restrictions of capital distributions.

The following table gives an overview of the different Pillar 1 and Pillar 2 minimum capital requirements (but excluding the "Pillar 2" guidance) as well as capital buffer requirements applicable to Deutsche Bank in the years 2018 and 2019 (articulated on a phase-in basis):

Overview total capital requirements and capital buffers

| | 2018 | 2019 |
|--|---------------------|---------------------|
| Pillar 1 | | |
| Minimum CET 1 requirement | 4.50 % | 4.50 % |
| Combined buffer requirement | 3.44 % | 4.57 % |
| Capital Conservation Buffer | 1.875 % | 2.50 % |
| Countercyclical Buffer | 0.07 % ¹ | 0.07 % ¹ |
| Maximum of: | 1.50 % | 2.00 % |
| G-SII Buffer | 1.50 % | 2.00 % |
| O-SII Buffer | 1.32 % | 2.00 % |
| Systemic Risk Buffer | 0.00 % | 0.00 % ² |
| Pillar 2 | | |
| Pillar 2 SREP Add-on of CET 1 capital | 2.75 % | 2.75 % |
| Total CET 1 requirement from Pillar 1 and 2³ | 10.69 % | 11.82 % |
| Total Tier 1 requirement from Pillar 1 and 2 | 12.19 % | 13.32 % |
| Total capital requirement from Pillar 1 and 2 | 14.19 % | 15.32 % |

¹ Deutsche Bank's countercyclical buffer requirement is subject to country-specific buffer rates decreed by EBA and the Basel Committee of Banking Supervision (BCBS) as well as Deutsche Bank's relevant credit exposures as per respective reporting date. The countercyclical buffer rate for 2018 is as of December 31, 2018. The countercyclical buffer rate for 2019 has been assumed to be 0.07 % due to unavailability of 2019 data.

² The systemic risk buffer has been assumed to remain at 0 % for the projected year 2019, subject to changes based on further directives.

³ The total Pillar 1 and Pillar 2 CET 1 requirement (excluding the "Pillar 2" guidance) is calculated as the sum of the SREP requirement, the higher of the G-SII, O-SII and systemic risk buffer requirement as well as the countercyclical buffer requirement.

Article 440 (a) CRR - Geographical distribution of credit exposures

The following tables disclose the amount of the institution's specific countercyclical buffer as well as the geographical distribution of credit exposures relevant for its calculation in the standard format as set out in Commission Delegated Regulation (EU) 2015/1555. The geographical split table shows countries on an individual basis if they impose a countercyclical capital buffer rate or their total own funds requirements exceed € 20 million. The values for the remaining countries are shown as Other.

Countercyclical capital buffer rates are determined by Basel Committee member jurisdictions. Countercyclical capital buffer varies according to a percentage of risk weighted assets. The "General credit exposures" include only credit exposures to the private sector. Exposures to the public sector and to institutions are not in scope. The "Trading book exposures" contain

market risk standardized approach non-securitization and trading book securitization positions as well as IRC (“Incremental Risk Charge”) and CTP (“Correlation Trading Portfolio”) related positions.

Geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer

| in € m. | Dec 31, 2018 | | | | | |
|--|--------------------------|------------------------|--|---|--------------------------|------------------------|
| | General credit exposures | | Trading book exposures | | Securitization exposures | |
| | Exposure value for SA | Exposure value for IRB | Sum of long and short positions of trading book exposures for SA | Value of trading book exposures for Internal models | Exposure value for SA | Exposure value for IRB |
| Angola | 0 | 360 | 0 | 3 | 0 | 0 |
| Argentina | 25 | 355 | 0 | 0 | 0 | 0 |
| Australia | 213 | 3,033 | 673 | 0 | 62 | 636 |
| Austria | 11 | 1,545 | 0 | 0 | 0 | 0 |
| Belgium | 90 | 1,815 | 0 | 115 | 0 | 0 |
| Bermuda | 22 | 867 | 0 | 39 | 0 | 116 |
| Brazil | 6 | 718 | 0 | 0 | 0 | 0 |
| British Virgin Islands | 106 | 8,158 | 0 | 15 | 0 | 0 |
| Canada | 159 | 2,679 | 6 | 80 | 0 | 360 |
| Cayman Islands | 317 | 5,789 | 66 | 24 | 0 | 982 |
| China | 36 | 5,462 | 131 | 2,436 | 0 | 0 |
| Czech Republic | 19 | 180 | 0 | 5 | 0 | 0 |
| Denmark | 4 | 1,563 | 0 | 107 | 0 | 0 |
| Finland | 6 | 782 | 0 | 89 | 0 | 0 |
| France | 97 | 6,010 | 185 | 836 | 0 | 509 |
| Germany | 7,180 | 240,772 | 160 | 3,225 | 0 | 6,125 |
| Hong Kong | 80 | 5,232 | 0 | 147 | 0 | 0 |
| Iceland | 3 | 24 | 0 | 60 | 0 | 0 |
| India | 2,157 | 6,805 | 0 | 913 | 0 | 0 |
| Indonesia | 50 | 1,931 | 0 | 126 | 0 | 0 |
| Ireland | 574 | 7,484 | 345 | 156 | 12 | 3,509 |
| Israel | 23 | 449 | 0 | 0 | 0 | 0 |
| Italy (incl. San Marino) | 1,446 | 23,673 | 22 | 0 | 38 | 121 |
| Japan | 102 | 2,868 | 0 | 0 | 0 | 144 |
| Jersey | 154 | 1,608 | 2 | 9 | 223 | 5 |
| Lebanon | 0 | 633 | 0 | 0 | 0 | 0 |
| Lithuania | 0 | 4 | 0 | 0 | 0 | 0 |
| Luxembourg | 3,939 | 13,346 | 14 | 182 | 0 | 3,153 |
| Malaysia | 15 | 921 | 10 | 539 | 0 | 0 |
| Mauritius | 335 | 244 | 0 | 0 | 0 | 0 |
| Mexico | 14 | 1,852 | 0 | 0 | 0 | 0 |
| Netherlands | 1,061 | 13,144 | 215 | 245 | 0 | 327 |
| Norway | 1 | 2,114 | 0 | 188 | 0 | 0 |
| Pakistan | 2 | 238 | 0 | 0 | 0 | 0 |
| Philippines | 5 | 749 | 0 | 144 | 0 | 0 |
| Poland | 18 | 3,514 | 0 | 0 | 0 | 0 |
| Portugal | 50 | 2,948 | 20 | 135 | 17 | 0 |
| Russian Federation | 1 | 624 | 0 | 0 | 0 | 0 |
| Saudi Arabia | 63 | 5,341 | 0 | 0 | 0 | 0 |
| Singapore | 129 | 9,073 | 22 | 591 | 0 | 0 |
| Slovakia | 0 | 86 | 0 | 0 | 0 | 0 |
| South Korea | 9 | 5,298 | 0 | 2,148 | 0 | 0 |
| South Africa | 7 | 540 | 0 | 0 | 0 | 0 |
| Spain | 380 | 20,043 | 171 | 319 | 4 | 105 |
| Sweden | 8 | 1,945 | 0 | 0 | 171 | 0 |
| Switzerland | 89 | 9,535 | 0 | 226 | 0 | 0 |
| Taiwan | 42 | 1,452 | 0 | 543 | 0 | 0 |
| Thailand | 0 | 1,211 | 0 | 336 | 0 | 0 |
| Turkey | 1 | 609 | 0 | 38 | 0 | 0 |
| United Arab Emirates | 14 | 1,507 | 0 | 0 | 0 | 0 |
| United Kingdom | 579 | 23,411 | 812 | 1,807 | 250 | 380 |
| United States of America (incl. Puerto Rico) | 3,626 | 130,341 | 2,381 | 2,754 | 1,276 | 47,929 |
| Vietnam | 6 | 342 | 0 | 25 | 0 | 0 |
| Other | 267 | 10,452 | 15 | 534 | 32 | 3,277 |
| Total | 23,540 | 591,678 | 5,251 | 19,135 | 2,085 | 67,677 |

Dec 31, 2018

| in € m. | Own funds requirements | | | | Own funds requirements weights | Countercyclical capital buffer rate (in %) |
|--|------------------------------------|----------------------------------|------------------------------------|---------------|--------------------------------|--|
| | of which: General credit exposures | of which: Trading book exposures | of which: Securitization exposures | Total | | |
| Angola | 32 | 0 | 0 | 33 | 0.00 | 0.00 |
| Argentina | 42 | 3 | 0 | 46 | 0.00 | 0.00 |
| Australia | 83 | 51 | 15 | 150 | 0.01 | 0.00 |
| Austria | 46 | 5 | 0 | 51 | 0.00 | 0.00 |
| Belgium | 35 | 10 | 0 | 45 | 0.00 | 0.00 |
| Bermuda | 31 | 0 | 1 | 31 | 0.00 | 0.00 |
| Brazil | 20 | 0 | 0 | 20 | 0.00 | 0.00 |
| British Virgin Islands | 56 | 1 | 0 | 57 | 0.00 | 0.00 |
| Canada | 75 | 0 | 2 | 78 | 0.00 | 0.00 |
| Cayman Islands | 227 | 25 | 9 | 260 | 0.02 | 0.00 |
| China | 234 | 80 | 0 | 314 | 0.02 | 0.00 |
| Czech Republic | 7 | 0 | 0 | 7 | 0.00 | 1.00 |
| Denmark | 39 | 4 | 0 | 43 | 0.00 | 0.00 |
| Finland | 21 | 0 | 0 | 21 | 0.00 | 0.00 |
| France | 183 | 104 | 27 | 314 | 0.02 | 0.00 |
| Germany | 5,942 | 117 | 41 | 6,100 | 0.36 | 0.00 |
| Hong Kong | 105 | 6 | 0 | 111 | 0.01 | 1.88 |
| Iceland | 2 | 4 | 0 | 6 | 0.00 | 1.25 |
| India | 364 | 50 | 0 | 415 | 0.02 | 0.00 |
| Indonesia | 75 | 15 | 0 | 89 | 0.01 | 0.00 |
| Ireland | 199 | 47 | 135 | 380 | 0.02 | 0.00 |
| Israel | 20 | 2 | 0 | 22 | 0.00 | 0.00 |
| Italy (incl. San Marino) | 1,000 | 40 | 20 | 1,060 | 0.06 | 0.00 |
| Japan | 77 | 1 | 1 | 78 | 0.00 | 0.00 |
| Jersey | 86 | 1 | 9 | 96 | 0.01 | 0.00 |
| Lebanon | 20 | 0 | 0 | 20 | 0.00 | 0.00 |
| Lithuania | 0 | 0 | 0 | 0 | 0.00 | 0.50 |
| Luxembourg | 559 | 32 | 18 | 609 | 0.04 | 0.00 |
| Malaysia | 28 | 23 | 0 | 51 | 0.00 | 0.00 |
| Mauritius | 39 | 0 | 0 | 39 | 0.00 | 0.00 |
| Mexico | 35 | 0 | 0 | 35 | 0.00 | 0.00 |
| Netherlands | 466 | 13 | 18 | 497 | 0.03 | 0.00 |
| Norway | 25 | 12 | 0 | 37 | 0.00 | 2.00 |
| Pakistan | 29 | 0 | 0 | 29 | 0.00 | 0.00 |
| Philippines | 27 | 2 | 0 | 29 | 0.00 | 0.00 |
| Poland | 94 | 0 | 0 | 94 | 0.01 | 0.00 |
| Portugal | 33 | 26 | 1 | 60 | 0.00 | 0.00 |
| Russian Federation | 28 | 0 | 0 | 28 | 0.00 | 0.00 |
| Saudi Arabia | 48 | 0 | 0 | 48 | 0.00 | 0.00 |
| Singapore | 137 | 6 | 0 | 143 | 0.01 | 0.00 |
| Slovakia | 2 | 1 | 0 | 3 | 0.00 | 1.25 |
| South Korea | 64 | 39 | 0 | 103 | 0.01 | 0.00 |
| South Africa | 22 | 19 | 0 | 41 | 0.00 | 0.00 |
| Spain | 641 | 4 | 13 | 658 | 0.04 | 0.00 |
| Sweden | 61 | 0 | 3 | 64 | 0.00 | 2.00 |
| Switzerland | 146 | 0 | 0 | 147 | 0.01 | 0.00 |
| Taiwan | 45 | 3 | 0 | 47 | 0.00 | 0.00 |
| Thailand | 25 | 13 | 0 | 38 | 0.00 | 0.00 |
| Turkey | 38 | 19 | 0 | 57 | 0.00 | 0.00 |
| United Arab Emirates | 32 | 0 | 0 | 32 | 0.00 | 0.00 |
| United Kingdom | 490 | 210 | 30 | 729 | 0.04 | 1.00 |
| United States of America (incl. Puerto Rico) | 2,521 | 341 | 367 | 3,228 | 0.19 | 0.00 |
| Vietnam | 31 | 1 | 0 | 32 | 0.00 | 0.00 |
| Other | 308 | 22 | 31 | 361 | 0.02 | 0.00 |
| Total | 14,994 | 1,350 | 740 | 17,084 | 1.00 | 0.07 |

| in € m. | Dec 31, 2017 | | | | | |
|--|--------------------------|------------------------|--|---|--------------------------|------------------------|
| | General credit exposures | | Trading book exposures | | Securitization exposures | |
| | Exposure value for SA | Exposure value for IRB | Sum of long and short positions of trading book exposures for SA | Value of trading book exposures for Internal models | Exposure value for SA | Exposure value for IRB |
| Argentina | 17 | 181 | 0 | 147 | 0 | 0 |
| Australia | 184 | 2,988 | 1,044 | 149 | 104 | 279 |
| Austria | 37 | 1,607 | 44 | 365 | 0 | 0 |
| Belgium | 150 | 1,726 | 0 | 0 | 0 | 0 |
| Bermuda | 26 | 1,145 | 16 | 49 | 0 | 31 |
| Brazil | 11 | 889 | 0 | 252 | 0 | 0 |
| British Virgin Islands | 68 | 7,554 | 0 | 31 | 0 | 0 |
| Canada | 118 | 3,874 | 1 | 42 | 0 | 249 |
| Cayman Islands | 395 | 6,642 | 20 | 26 | 0 | 960 |
| China | 29 | 4,719 | 217 | 1,264 | 0 | 0 |
| Cyprus | 28 | 308 | 0 | 123 | 0 | 0 |
| Czech Republic | 4 | 379 | 0 | 0 | 0 | 0 |
| Denmark | 1 | 1,730 | 0 | 176 | 0 | 0 |
| Egypt | 0 | 850 | 0 | 48 | 0 | 0 |
| France | 6 | 6,500 | 187 | 123 | 0 | 307 |
| Germany | 8,219 | 234,859 | 94 | 1,899 | 0 | 7,392 |
| Greece | 3 | 981 | 0 | 96 | 0 | 0 |
| Hong Kong | 76 | 5,725 | 0 | 165 | 0 | 0 |
| Iceland | 0 | 72 | 0 | 42 | 0 | 0 |
| India | 1,917 | 6,494 | 0 | 1,048 | 0 | 0 |
| Indonesia | 24 | 1,657 | 0 | 198 | 0 | 0 |
| Ireland | 624 | 7,068 | 259 | 3 | 15 | 2,020 |
| Isle of Man | 0 | 448 | 0 | 3 | 0 | 0 |
| Israel | 33 | 634 | 0 | 8 | 0 | 0 |
| Italy (incl. San Marino) | 1,739 | 22,565 | 94 | 799 | 10 | 78 |
| Japan | 148 | 3,804 | 172 | 0 | 0 | 142 |
| Jersey | 186 | 1,665 | 0 | 17 | 169 | 3 |
| Luxembourg | 2,366 | 14,067 | 2 | 393 | 0 | 1,749 |
| Malaysia | 67 | 814 | 0 | 441 | 0 | 0 |
| Mauritius | 103 | 339 | 0 | 0 | 0 | 0 |
| Mexico | 6 | 1,866 | 0 | 110 | 0 | 0 |
| Netherlands | 1,144 | 14,662 | 122 | 0 | 0 | 322 |
| Norway | 12 | 990 | 0 | 105 | 0 | 0 |
| Pakistan | 26 | 297 | 0 | 8 | 0 | 0 |
| Philippines | 6 | 529 | 0 | 144 | 0 | 0 |
| Poland | 666 | 7,821 | 0 | 7 | 0 | 0 |
| Portugal | 78 | 2,523 | 68 | 0 | 18 | 0 |
| Russian Federation | 21 | 1,032 | 0 | 0 | 0 | 0 |
| Saudi Arabia | 10 | 8,371 | 0 | 0 | 0 | 0 |
| Singapore | 91 | 6,611 | 46 | 455 | 0 | 87 |
| Slovakia | 0 | 52 | 0 | 0 | 0 | 0 |
| South Africa | 7 | 4,895 | 0 | 968 | 0 | 0 |
| South Korea | 33 | 782 | 0 | 0 | 0 | 0 |
| Spain | 393 | 15,126 | 98 | 1,158 | 2 | 128 |
| Sweden | 0 | 1,540 | 1 | 70 | 0 | 0 |
| Switzerland | 46 | 11,090 | 0 | 290 | 0 | 0 |
| Taiwan | 3 | 1,943 | 0 | 253 | 0 | 0 |
| Thailand | 19 | 1,587 | 0 | 150 | 0 | 0 |
| Turkey | 29 | 940 | 0 | 0 | 0 | 0 |
| United Arab Emirates | 33 | 1,185 | 67 | 66 | 0 | 0 |
| United Kingdom | 819 | 25,060 | 1,585 | 0 | 74 | 460 |
| United States of America (incl. Puerto Rico) | 3,029 | 136,099 | 3,313 | 5,592 | 1,206 | 43,479 |
| Venezuela | 0 | 42 | 0 | 58 | 0 | 0 |
| Other | 314 | 12,087 | 29 | 402 | 196 | 3,321 |
| Total | 23,363 | 599,408 | 7,478 | 17,740 | 1,794 | 61,008 |

Dec 31, 2017

| in € m. | Own funds requirements | | | | Own funds requirements weights | Countercyclical capital buffer rate (in %) |
|--|------------------------------------|----------------------------------|------------------------------------|---------------|--------------------------------|--|
| | of which: General credit exposures | of which: Trading book exposures | of which: Securitization exposures | Total | | |
| Argentina | 10 | 13 | 0 | 23 | 0.00 | 0.00 |
| Australia | 91 | 54 | 13 | 158 | 0.01 | 0.00 |
| Austria | 43 | 14 | 1 | 57 | 0.00 | 0.00 |
| Belgium | 40 | 4 | 1 | 44 | 0.00 | 0.00 |
| Bermuda | 58 | 8 | 1 | 68 | 0.00 | 0.00 |
| Brazil | 26 | 9 | 2 | 36 | 0.00 | 0.00 |
| British Virgin Islands | 45 | 3 | 0 | 48 | 0.00 | 0.00 |
| Canada | 100 | 7 | 5 | 112 | 0.01 | 0.00 |
| Cayman Islands | 388 | 9 | 20 | 417 | 0.02 | 0.00 |
| China | 200 | 63 | 0 | 263 | 0.02 | 0.00 |
| Cyprus | 14 | 16 | 0 | 29 | 0.00 | 0.00 |
| Czech Republic | 6 | 0 | 0 | 6 | 0.00 | 0.50 |
| Denmark | 27 | 6 | 1 | 35 | 0.00 | 0.00 |
| Egypt | 27 | 2 | 0 | 29 | 0.00 | 0.00 |
| France | 187 | 48 | 25 | 260 | 0.02 | 0.00 |
| Germany | 5,765 | 74 | 71 | 5,910 | 0.35 | 0.00 |
| Greece | 27 | 19 | 0 | 45 | 0.00 | 0.00 |
| Hong Kong | 81 | 5 | 1 | 87 | 0.01 | 1.25 |
| Iceland | 3 | 8 | 0 | 11 | 0.00 | 1.25 |
| India | 317 | 150 | 2 | 469 | 0.03 | 0.00 |
| Indonesia | 71 | 13 | 1 | 85 | 0.00 | 0.00 |
| Ireland | 259 | 38 | 64 | 361 | 0.02 | 0.00 |
| Isle of Man | 23 | 0 | 1 | 23 | 0.00 | 0.00 |
| Israel | 36 | 7 | 0 | 43 | 0.00 | 0.00 |
| Italy (incl. San Marino) | 934 | 42 | 7 | 983 | 0.06 | 0.00 |
| Japan | 102 | 0 | 1 | 103 | 0.01 | 0.00 |
| Jersey | 93 | 1 | 11 | 105 | 0.01 | 0.00 |
| Luxembourg | 350 | 38 | 14 | 402 | 0.02 | 0.00 |
| Malaysia | 30 | 0 | 0 | 30 | 0.00 | 0.00 |
| Mauritius | 43 | 0 | 1 | 43 | 0.00 | 0.00 |
| Mexico | 32 | 1 | 2 | 35 | 0.00 | 0.00 |
| Netherlands | 487 | 27 | 36 | 549 | 0.03 | 0.00 |
| Norway | 27 | 3 | 1 | 31 | 0.00 | 2.00 |
| Pakistan | 28 | 3 | 0 | 31 | 0.00 | 0.00 |
| Philippines | 19 | 4 | 0 | 24 | 0.00 | 0.00 |
| Poland | 314 | 0 | 0 | 314 | 0.02 | 0.00 |
| Portugal | 36 | 8 | 2 | 45 | 0.00 | 0.00 |
| Russian Federation | 50 | 0 | 0 | 50 | 0.00 | 0.00 |
| Saudi Arabia | 56 | 1 | 2 | 59 | 0.00 | 0.00 |
| Singapore | 119 | 11 | 9 | 139 | 0.01 | 0.00 |
| Slovakia | 2 | 0 | 0 | 2 | 0.00 | 0.50 |
| South Africa | 73 | 5 | 0 | 78 | 0.00 | 0.00 |
| South Korea | 47 | 3 | 0 | 50 | 0.00 | 0.00 |
| Spain | 513 | 54 | 11 | 578 | 0.03 | 0.00 |
| Sweden | 35 | 2 | 1 | 38 | 0.00 | 2.00 |
| Switzerland | 182 | 7 | 1 | 190 | 0.01 | 0.00 |
| Taiwan | 40 | 1 | 0 | 40 | 0.00 | 0.00 |
| Thailand | 41 | 3 | 0 | 44 | 0.00 | 0.00 |
| Turkey | 42 | 0 | 0 | 42 | 0.00 | 0.00 |
| United Arab Emirates | 25 | 3 | 0 | 28 | 0.00 | 0.00 |
| United Kingdom | 540 | 144 | 24 | 709 | 0.04 | 0.00 |
| United States of America (incl. Puerto Rico) | 2,499 | 253 | 402 | 3,155 | 0.19 | 0.00 |
| Venezuela | 1 | 27 | 0 | 28 | 0.00 | 0.00 |
| Other | 255 | 40 | 81 | 375 | 0.02 | 0.00 |
| Total | 14,854 | 1,248 | 814 | 16,915 | 1.00 | 0.02 |

Article 440 (b) CRR - Institution specific countercyclical capital buffer

The following table shows an overview of our countercyclical exposure and buffer requirements.

Institution-specific countercyclical capital buffer

| | Dec 31, 2018 | Dec 31, 2017 |
|---|--------------|--------------|
| Total risk exposure amount (in € m.) ¹ | 350,432 | 343,316 |
| Institution specific countercyclical buffer rate | 0.07 % | 0.02 % |
| Institution specific countercyclical buffer requirement (in € m.) | 237 | 53 |

¹ To calculate the institution specific countercyclical buffer requirement the phase-in value of the total risk exposure amount is used.

Credit risk and credit risk mitigation

General qualitative information on credit risk

Article 442 (a) CRR - Definitions of past due and impairment

Loans are considered to be past due if contractually agreed payments of principal and/or interest remain unpaid by the borrower, except if those are acquired through consolidation. The latter are considered to be past due if payments of principal and/or interest, which were expected at a certain payment date at the time of the initial consolidation of the loans, are unpaid by the borrower.

The Group has aligned its definition of “credit impaired” under IFRS 9 to the default definition as per Art. 178 of the Capital Requirements Regulation (CRR) for regulatory purposes. As a consequence, credit impaired financial assets (or Stage 3 financial assets) consist of two types of defaulted financial assets: firstly financial assets, where the Group expects an impairment loss reflected in an allowance for credit losses and secondly financial assets, where the group does not expect an impairment loss (e.g., due to high quality collateral or sufficient expected future cash flows following thorough due diligence). This is a major difference to our impairment definition under IAS 39, where financial assets were only considered to be impaired if the Group expected to suffer an impairment loss.

Article 442 (b) CRR - Credit risk adjustments

Following the introduction of IFRS 9 in 2018, the impairment definition has changed compared to prior years. IFRS 9 accounting rules have been applied for the current reporting period and will continue to be used onwards, while comparative numbers have been based on IAS 39 accounting rules. Credit risk adjustments and credit risk adjustment charges of the period are therefore not comparable.

The determination of impairment losses and allowance moves from an incurred credit loss model under IAS 39, whereby credit losses are recognized when a defined loss event occurs, to an expected credit loss model under IFRS 9, where allowances for loan losses are recorded upon initial recognition of the financial asset, based on expectations of potential credit losses at the time of initial recognition.

For a detailed description of the Group’s accounting policies and risk management practices, please refer to Note 1, “Significant accounting policies and critical accounting estimates” to the consolidated financial statements and chapter “Credit risk management” in our Annual Report 2018 on page 223 and 61.

General quantitative information on credit risk

Article 442 (c) CRR - Total and average amount of credit exposure by exposure classes

The table EU CRB-B below shows the total and average net credit risk exposures based on IFRS accounting values according to the regulatory scope of consolidation. For on-balance sheet items the “Net value of exposure” is calculated by deducting credit risk adjustments from the gross amount and for off-balance sheet exposures respective provisions have been deducted. Hence, credit risk exposures values are shown after accounting offsets but before credit risk mitigation. The breakout into the exposure classes follows those as defined for the IRBA (i.e., combining the advanced and foundation IRB) as well as the for the standardized approach. In the IRB approach, the line item “Central governments and central banks” includes exposures to regional governments or local authorities, public sector entities, multilateral development banks and international organizations. The exposure class “Other items” within the standardized approach includes all exposures not covered in the other categories. The average credit exposure is calculated as on December 31, 2018 taking the averages of all four quarters of the fiscal year.

EU CRB-B – Total and average net amount of exposures

| in € m. | Dec 31, 2018 | | Dec 31, 2017 ¹ | |
|--|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|
| | a | b | a | b |
| | Net exposure at the end of the period | Average net exposure over the period | Net exposure at the end of the period | Average net exposure over the period |
| 1 Central governments and central banks | 118,444 | 118,105 | 116,542 | 113,694 |
| 2 Institutions | 26,207 | 26,053 | 26,817 | 25,092 |
| 3 Corporates | 381,377 | 375,678 | 362,630 | 339,094 |
| of which: | | | | |
| 5 SMEs | 16,661 | 17,569 | 16,693 | 14,850 |
| 4 Specialized lending | 34,797 | 34,008 | 32,345 | 30,267 |
| 4a Other | 329,918 | 324,101 | 313,593 | 293,976 |
| 6 Retail | 218,063 | 219,459 | 217,727 | 212,197 |
| of which: | | | | |
| 8 Secured by real estate property SMEs | 9,433 | 9,737 | 9,861 | 9,424 |
| 9 Secured by real estate property non-SMEs | 156,297 | 157,382 | 156,716 | 155,429 |
| 10 Qualifying revolving | 16,466 | 16,662 | 16,941 | 11,442 |
| 12 Other retail SMEs | 5,698 | 5,910 | 5,739 | 6,454 |
| 13 Other retail non-SMEs | 30,169 | 29,768 | 28,469 | 29,449 |
| 14 Equity | 2,137 | 1,788 | 1,476 | 1,872 |
| 14a Other non-credit obligation asset | 6,893 | 6,792 | 7,882 | 6,792 |
| 15 Total IRB approach | 753,121 | 747,875 | 733,073 | 698,741 |
| 16 Central governments or central banks | 112,424 | 124,939 | 153,171 | 149,373 |
| 17 Regional governments or local authorities | 10,085 | 10,541 | 12,208 | 12,584 |
| 18 Public sector entities | 5,336 | 5,979 | 6,505 | 6,752 |
| 19 Multilateral development banks | 3,344 | 3,936 | 5,234 | 5,543 |
| 20 International organizations | 1,496 | 1,622 | 2,125 | 1,976 |
| 21 Institutions | 1,412 | 1,474 | 1,796 | 1,496 |
| 22 Corporates | 19,499 | 19,669 | 14,445 | 14,689 |
| 24 Retail | 4,280 | 4,510 | 4,817 | 10,640 |
| 26 Secured by mortgages on immovable property | 4,481 | 4,244 | 3,948 | 3,984 |
| 28 Exposures in default ² | 938 | 962 | 1,014 | 1,312 |
| 29 Items associated with particularly high risk | 339 | 271 | 254 | 185 |
| 30 Covered bonds | 0 | 0 | 0 | 0 |
| 31 Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 |
| 32 Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 |
| 33 Equity exposures | 50 | 124 | 140 | 172 |
| 34 Other items | 12 | 33 | 124 | 94 |
| 35 Total standardized approach | 162,758 | 177,343 | 205,781 | 208,799 |
| 36 Total | 915,879 | 925,218 | 938,854 | 907,540 |

¹ Previous year balances reflect the fully loaded exposure view and therefore do not include the exposure shift from the advanced IRB to the standard approach of grandfathered equity investments.

² In light of recent EBA guidance (Q&A 2017_3481) we have revised our approach to present the defaulted exposure within the standardized approach: We present the total of defaulted exposure in line 28 but also show a breakdown of defaulted exposure and assign it to their respective exposure classes. In order to avoid double counting of exposures, the total exposure of the standardized approach as presented in row 35 does not take into account figures disclosed under row 28. This new approach is applied for December 31, 2018, but not for the comparative numbers as of December 31, 2017.

Article 442 (d) CRR - Geographic distribution of credit exposure

The table EU CRB-C below shows exposures broken down by significant geographical areas and exposure classes. For on-balance sheet items the "Net value of exposure" is calculated by deducting credit risk adjustments from the gross amount and for off-balance sheet exposures respective provisions have been deducted. Hence, credit risk exposures values are shown after accounting offsets but before credit risk mitigation. They are based on IFRS accounting values according to the regulatory scope of consolidation.

We consider a country as being significant, if it contributes to an aggregate of 90 % of our total exposure. An area is considered significant if it contains at least one significant country. The geographical distribution is based on the legal domicile of the counterparty or issuer. Exposures to geographical areas or countries that are not deemed significant are aggregated and reported in the residual column 'other geographical areas' or (within each significant area) 'other countries'.

The breakdown into the exposure classes follows those as defined for the IRBA (i.e., combining the advanced and foundation IRB) as well as for the standardized approach. In the IRB approach, the line item "Central governments and central banks" includes exposures to regional governments or local authorities, public sector entities, multilateral developments banks and international organizations. The exposure class "Other items" within the standardized approach includes all exposures not covered in the other categories.

EU CRB-C – Geographical breakdown of exposures

| | | Dec 31, 2018 | | | | | | |
|---------|---|----------------|----------------|----------------|---------------|---------------|---------------|---------------|
| | | a | b | c | d | e | f | g |
| | | Europe | | | | | | |
| in € m. | | Europe | Germany | United Kingdom | France | Luxembourg | Italy | Netherlands |
| 1 | Central governments and central banks | 13,806 | 4,887 | 0 | 0 | 0 | 934 | 0 |
| 2 | Institutions | 9,720 | 2,040 | 1,184 | 1,081 | 848 | 156 | 412 |
| 3 | Corporates | 187,749 | 78,542 | 13,609 | 8,878 | 10,356 | 10,031 | 17,272 |
| | of which: | | | | | | | |
| 3a | SMEs | 14,759 | 10,848 | 69 | 55 | 87 | 1,911 | 371 |
| 3b | Specialized lending | 14,177 | 3,012 | 902 | 951 | 2,010 | 673 | 932 |
| 3c | Other | 158,814 | 64,682 | 12,638 | 7,872 | 8,258 | 7,446 | 15,969 |
| 4 | Retail | 217,455 | 185,926 | 486 | 187 | 42 | 15,479 | 165 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 9,426 | 9,065 | 1 | 1 | 6 | 192 | 3 |
| 4b | Secured by real estate property non-SMEs | 156,061 | 137,187 | 152 | 66 | 31 | 7,477 | 90 |
| 4c | Qualifying revolving | 16,426 | 16,294 | 6 | 13 | 1 | 47 | 6 |
| 4d | Other retail SMEs | 5,665 | 3,206 | 5 | 7 | 0 | 907 | 5 |
| 4e | Other retail non-SMEs | 29,876 | 20,174 | 322 | 101 | 4 | 6,856 | 60 |
| 5 | Equity | 1,244 | 476 | 335 | 1 | 130 | 58 | 1 |
| 5a | Other non-credit obligation asset | 5,191 | 5,040 | 1 | 26 | 14 | 0 | 2 |
| 6 | Total IRB approach | 435,165 | 276,912 | 15,615 | 10,175 | 11,389 | 26,659 | 17,851 |
| 7 | Central governments or central banks | 112,293 | 91,033 | 7,445 | 1,089 | 6,516 | 1,343 | 1,163 |
| 8 | Regional governments or local authorities | 10,048 | 9,827 | 0 | 0 | 0 | 0 | 0 |
| 9 | Public sector entities | 5,231 | 5,195 | 0 | 0 | 0 | 0 | 0 |
| 10 | Multilateral development banks | 491 | 0 | 0 | 134 | 358 | 0 | 0 |
| 11 | International organizations | 798 | 0 | 0 | 0 | 373 | 0 | 0 |
| 12 | Institutions | 1,365 | 1,272 | 63 | 3 | 0 | 0 | 0 |
| 13 | Corporates | 10,710 | 7,192 | 235 | 129 | 985 | 383 | 688 |
| 14 | Retail | 3,623 | 1,505 | 4 | 3 | 235 | 1,681 | 99 |
| 15 | Secured by mortgages on immovable property | 2,835 | 283 | 18 | 43 | 1,087 | 450 | 487 |
| 16 | Exposures in default [†] | 788 | 347 | 1 | 0 | 10 | 191 | 62 |
| 17 | Items associated with particularly high risk | 155 | 0 | 1 | 0 | 0 | 125 | 0 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 6 | 6 | 0 | 0 | 0 | 0 | 0 |
| 22 | Other items | 4 | 4 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 147,559 | 116,317 | 7,765 | 1,401 | 9,553 | 3,982 | 2,438 |
| 24 | Total | 582,725 | 393,228 | 23,380 | 11,576 | 20,942 | 30,640 | 20,289 |

| | | Dec 31, 2018 | | | | | | |
|-----------|---|---------------|--------------|---------------|--------------|--------------|---------------------------|------------------|
| | | h | i | j | k | l | m | n |
| in € m. | | Spain | Ireland | Switzerland | Poland | Belgium | Europe Other Europe | North America |
| 1 | Central governments and central banks | 268 | 0 | 3,830 | 2,424 | 127 | 1,335 | 87,234 |
| 2 | Institutions | 564 | 75 | 644 | 11 | 1,059 | 1,645 | 7,481 |
| 3 | Corporates | 10,620 | 5,719 | 13,296 | 1,127 | 2,738 | 15,562 | 141,336 |
| | of which: | | | | | | | |
| 3a | SMEs | 906 | 19 | 243 | 8 | 7 | 233 | 1,030 |
| 3b | Specialized lending | 885 | 1,624 | 76 | 245 | 283 | 2,584 | 18,094 |
| 3c | Other | 8,829 | 4,076 | 12,977 | 873 | 2,447 | 12,745 | 122,212 |
| 4 | Retail | 9,993 | 26 | 251 | 2,424 | 48 | 2,427 | 105 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 107 | 0 | 5 | 2 | 1 | 43 | 1 |
| 4b | Secured by real estate property non-SMEs | 6,953 | 24 | 183 | 2,403 | 33 | 1,463 | 74 |
| 4c | Qualifying revolving | 6 | 0 | 20 | 3 | 5 | 25 | 9 |
| 4d | Other retail SMEs | 1,436 | 1 | 4 | 3 | 2 | 90 | 11 |
| 4e | Other retail non-SMEs | 1,492 | 0 | 39 | 13 | 8 | 806 | 11 |
| 5 | Equity | 7 | 19 | 62 | 130 | 16 | 10 | 707 |
| 5a | Other non-credit obligation asset | 0 | 13 | 45 | 8 | 0 | 43 | 337 |
| 6 | Total IRB approach | 21,453 | 5,851 | 18,128 | 6,123 | 3,989 | 21,022 | 237,201 |
| 7 | Central governments or central banks | 1,780 | 201 | 0 | 70 | 489 | 1,164 | 10 |
| 8 | Regional governments or local authorities | 221 | 0 | 0 | 0 | 0 | 0 | 37 |
| 9 | Public sector entities | 36 | 0 | 0 | 0 | 0 | 0 | 76 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 425 | 0 | 0 |
| 12 | Institutions | 0 | 0 | 7 | 0 | 0 | 20 | 33 |
| 13 | Corporates | 69 | 467 | 44 | 18 | 31 | 470 | 5,765 |
| 14 | Retail | 64 | 0 | 5 | 0 | 17 | 8 | 1 |
| 15 | Secured by mortgages on immovable property | 239 | 67 | 52 | 0 | 67 | 42 | 76 |
| 16 | Exposures in default ¹ | 1 | 141 | 3 | (1) | 4 | 26 | 4 |
| 17 | Items associated with particularly high risk | 6 | 0 | 0 | 0 | 0 | 23 | 179 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 23 | Total standardized approach | 2,417 | 736 | 108 | 89 | 1,029 | 1,726 | 6,227 |
| 24 | Total | 23,869 | 6,587 | 18,235 | 6,212 | 5,018 | 22,748 | 243,428 |

| | | Dec 31, 2018 | | | | | | |
|-----------|---|----------------|----------------|--------------|---------------------|---------------|--------------|--------------|
| | | o | p | q | r | s | t | u |
| | | North America | | | | Asia/Pacific | | |
| in € m. | | U.S. | Cayman Islands | Canada | Other North America | Asia/Pacific | Japan | Australia |
| 1 | Central governments and central banks | 87,125 | 0 | 96 | 14 | 15,389 | 4,617 | 463 |
| 2 | Institutions | 6,558 | 0 | 923 | 0 | 8,201 | 394 | 856 |
| 3 | Corporates | 127,816 | 2,638 | 2,505 | 8,377 | 45,591 | 1,488 | 2,473 |
| | of which: | | | | | | | |
| 3a | SMEs | 913 | 0 | 1 | 116 | 635 | 0 | 10 |
| 3b | Specialized lending | 17,411 | 198 | 152 | 332 | 2,243 | 611 | 417 |
| 3c | Other | 109,492 | 2,440 | 2,352 | 7,928 | 42,713 | 877 | 2,047 |
| 4 | Retail | 91 | 0 | 14 | 0 | 240 | 6 | 12 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 1 | 0 | 0 | 0 | 6 | 0 | 2 |
| 4b | Secured by real estate property non-SMEs | 68 | 0 | 5 | 0 | 123 | 5 | 6 |
| 4c | Qualifying revolving | 8 | 0 | 1 | 0 | 20 | 1 | 1 |
| 4d | Other retail SMEs | 10 | 0 | 1 | 0 | 10 | 0 | 1 |
| 4e | Other retail non-SMEs | 4 | 0 | 7 | 0 | 80 | 0 | 2 |
| 5 | Equity | 685 | 22 | 0 | 0 | 68 | 7 | 1 |
| 5a | Other non-credit obligation asset | 326 | 12 | 0 | 0 | 970 | 58 | 20 |
| 6 | Total IRB approach | 222,601 | 2,672 | 3,538 | 8,390 | 70,458 | 6,570 | 3,826 |
| 7 | Central governments or central banks | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | Regional governments or local authorities | 37 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Public sector entities | 76 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Institutions | 33 | 0 | 0 | 0 | 9 | 2 | 1 |
| 13 | Corporates | 4,335 | 519 | 157 | 754 | 1,854 | 756 | 152 |
| 14 | Retail | 1 | 0 | 0 | 0 | 651 | 0 | 0 |
| 15 | Secured by mortgages on immovable property | 62 | 0 | 1 | 12 | 1,553 | 0 | 0 |
| 16 | Exposures in default ¹ | 4 | 0 | 0 | 0 | 146 | 99 | 0 |
| 17 | Items associated with particularly high risk | 179 | 0 | 0 | 0 | 4 | 0 | 0 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 42 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | Other items | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 4,783 | 519 | 158 | 766 | 4,071 | 758 | 154 |
| 24 | Total | 227,383 | 3,191 | 3,697 | 9,157 | 74,529 | 7,328 | 3,979 |

| | | Dec 31, 2018 | | | | | | |
|---------|---|--------------|-------|-----------|-----------|--------------------|--------------------------|---------|
| | | v | w | x | y | z | aa | ab |
| | | Asia/Pacific | | | | | Other geographical areas | Total |
| in € m. | | India | China | Singapore | Hong Kong | Other Asia/Pacific | | |
| 1 | Central governments and central banks | 2,772 | 1,102 | 1,881 | 342 | 4,212 | 2,016 | 118,444 |
| 2 | Institutions | 1,463 | 2,252 | 234 | 440 | 2,561 | 806 | 26,207 |
| 3 | Corporates | 7,533 | 4,331 | 7,989 | 5,531 | 16,246 | 6,700 | 381,377 |
| | of which: | | | | | | | |
| 3a | SMEs | 234 | 1 | 16 | 1 | 372 | 239 | 16,661 |
| 3b | Specialized lending | 272 | 0 | 171 | 93 | 680 | 283 | 34,797 |
| 3c | Other | 7,027 | 4,330 | 7,802 | 5,437 | 15,194 | 6,178 | 329,918 |
| 4 | Retail | 30 | 31 | 18 | 15 | 126 | 263 | 218,063 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 0 | 0 | 0 | 0 | 5 | 0 | 9,433 |
| 4b | Secured by real estate property non-SMEs | 3 | 22 | 14 | 14 | 59 | 40 | 156,297 |
| 4c | Qualifying revolving | 2 | 3 | 1 | 1 | 11 | 10 | 16,466 |
| 4d | Other retail SMEs | 3 | 3 | 0 | 0 | 3 | 11 | 5,698 |
| 4e | Other retail non-SMEs | 22 | 4 | 3 | 1 | 48 | 202 | 30,169 |
| 5 | Equity | 42 | 9 | 0 | 6 | 3 | 117 | 2,137 |
| 5a | Other non-credit obligation asset | 53 | 585 | 139 | 19 | 95 | 395 | 6,893 |
| 6 | Total IRB approach | 11,894 | 8,311 | 10,261 | 6,353 | 23,243 | 10,297 | 753,121 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 0 | 0 | 121 | 112,424 |
| 8 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 0 | 0 | 10,085 |
| 9 | Public sector entities | 0 | 0 | 0 | 0 | 0 | 29 | 5,336 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 2,853 | 3,344 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 698 | 1,496 |
| 12 | Institutions | 1 | 0 | 3 | 0 | 1 | 5 | 1,412 |
| 13 | Corporates | 236 | 6 | 48 | 280 | 376 | 1,169 | 19,499 |
| 14 | Retail | 643 | 0 | 0 | 0 | 7 | 5 | 4,280 |
| 15 | Secured by mortgages on immovable property | 1,517 | 11 | 0 | 1 | 23 | 17 | 4,481 |
| 16 | Exposures in default ¹ | 45 | 0 | 1 | 1 | 1 | 1 | 938 |
| 17 | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 4 | 1 | 339 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 2 | 50 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 23 | Total standardized approach | 2,397 | 18 | 51 | 281 | 413 | 4,900 | 162,758 |
| 24 | Total | 14,291 | 8,329 | 10,312 | 6,635 | 23,655 | 15,197 | 915,879 |

¹ In light of recent EBA guidance (Q&A 2017_3481) we have revised our approach to present the defaulted exposure within the standardized approach: We present the total of defaulted exposure in line 16 but also show a breakdown of defaulted exposure and assign it to their respective exposure classes. In order to avoid double counting of exposures, the total exposure of the standardized approach as presented in row 23 does not take into account figures disclosed under row 16. This new approach is applied for December 31, 2018, but not for the comparative numbers as of December 31, 2017.

| | | Dec 31, 2017 | | | | | | |
|-----------|---|----------------|----------------|----------------|---------------|---------------|---------------|---------------|
| | | a | b | c | d | e | f | g |
| | | Europe | | | | | | |
| in € m. | | Europe | Germany | United Kingdom | France | Luxembourg | Italy | Netherlands |
| 1 | Central governments and central banks | 12,061 | 3,835 | 0 | 0 | 441 | 215 | 0 |
| 2 | Institutions | 10,729 | 2,146 | 1,512 | 1,264 | 745 | 159 | 646 |
| 3 | Corporates | 179,873 | 77,046 | 11,698 | 12,333 | 8,711 | 9,839 | 15,536 |
| | of which: | | | | | | | |
| 3a | SMEs | 14,554 | 10,012 | 97 | 119 | 20 | 1,800 | 435 |
| 3b | Specialized lending | 14,909 | 3,337 | 968 | 861 | 1,704 | 632 | 1,137 |
| 3c | Other | 150,656 | 63,697 | 10,633 | 11,352 | 6,987 | 7,407 | 13,965 |
| 4 | Retail | 217,147 | 182,872 | 507 | 174 | 44 | 15,240 | 163 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 9,855 | 9,406 | 1 | 3 | 15 | 139 | 3 |
| 4b | Secured by real estate property non-SMEs | 156,475 | 134,495 | 165 | 65 | 25 | 8,040 | 88 |
| 4c | Qualifying revolving | 16,903 | 16,768 | 6 | 13 | 1 | 47 | 6 |
| 4d | Other retail SMEs | 5,711 | 3,226 | 5 | 7 | 0 | 877 | 7 |
| 4e | Other retail non-SMEs | 28,203 | 18,977 | 330 | 86 | 2 | 6,138 | 59 |
| 5 | Equity | 687 | 106 | 192 | 1 | 52 | 43 | 1 |
| 5a | Other non-credit obligation asset | 5,110 | 4,743 | 224 | 0 | 63 | 0 | 5 |
| 6 | Total IRB approach | 425,852 | 270,749 | 14,134 | 13,772 | 10,056 | 25,496 | 16,351 |
| 7 | Central governments or central banks | 152,792 | 119,895 | 10,877 | 2,251 | 7,359 | 3,965 | 2,084 |
| 8 | Regional governments or local authorities | 12,135 | 11,846 | 0 | 0 | 0 | 0 | 16 |
| 9 | Public sector entities | 6,408 | 6,290 | 84 | 0 | 0 | 0 | 0 |
| 10 | Multilateral development banks | 1,067 | 0 | 0 | 470 | 597 | 0 | 0 |
| 11 | International organizations | 923 | 0 | 0 | 0 | 603 | 0 | 0 |
| 12 | Institutions | 1,382 | 1,230 | 95 | 3 | 0 | 9 | 3 |
| 13 | Corporates | 7,755 | 4,158 | 1 | 56 | 1,361 | 522 | 574 |
| 14 | Retail | 4,127 | 1,492 | 39 | 1 | 67 | 1,743 | 107 |
| 15 | Secured by mortgages on immovable property | 2,638 | 230 | 4 | 10 | 1,014 | 397 | 610 |
| 16 | Exposures in default | 830 | 327 | 10 | 0 | 5 | 112 | 116 |
| 17 | Items associated with particularly high risk | 235 | 1 | 1 | 0 | 0 | 177 | 9 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 22 | Other items | 124 | 124 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 190,419 | 145,594 | 11,112 | 2,791 | 11,006 | 6,925 | 3,519 |
| 24 | Total | 616,271 | 416,343 | 25,245 | 16,564 | 21,062 | 32,420 | 19,869 |

| | | Dec 31, 2017 | | | | | | |
|-----------|---|---------------|--------------|---------------|---------------|--------------|---------------------------|------------------|
| | | h | i | j | k | l | m | n |
| in € m. | | Spain | Ireland | Switzerland | Poland | Belgium | Europe Other Europe | North America |
| 1 | Central governments and central banks | 193 | 0 | 3,299 | 2,056 | 12 | 2,009 | 87,354 |
| 2 | Institutions | 463 | 129 | 534 | 1 | 1,273 | 1,856 | 5,578 |
| 3 | Corporates | 7,333 | 4,909 | 13,114 | 2,597 | 2,566 | 14,192 | 135,609 |
| | of which: | | | | | | | |
| 3a | SMEs | 840 | 209 | 219 | 437 | 43 | 323 | 1,378 |
| 3b | Specialized lending | 694 | 1,756 | 85 | 289 | 249 | 3,196 | 15,219 |
| 3c | Other | 5,798 | 2,944 | 12,809 | 1,870 | 2,275 | 10,918 | 119,013 |
| 4 | Retail | 9,914 | 29 | 263 | 5,583 | 51 | 2,306 | 112 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 132 | 0 | 6 | 101 | 1 | 49 | 1 |
| 4b | Secured by real estate property non-SMEs | 7,072 | 26 | 186 | 4,883 | 33 | 1,396 | 76 |
| 4c | Qualifying revolving | 6 | 0 | 21 | 2 | 5 | 25 | 9 |
| 4d | Other retail SMEs | 1,361 | 1 | 4 | 135 | 2 | 87 | 9 |
| 4e | Other retail non-SMEs | 1,342 | 2 | 48 | 461 | 9 | 750 | 16 |
| 5 | Equity | 4 | 0 | 56 | 0 | 13 | 219 | 583 |
| 5a | Other non-credit obligation asset | 1 | 0 | 2 | 32 | 0 | 41 | 1,981 |
| 6 | Total IRB approach | 17,909 | 5,066 | 17,268 | 10,270 | 3,915 | 20,866 | 231,218 |
| 7 | Central governments or central banks | 1,925 | 559 | 0 | 72 | 1,163 | 2,642 | 237 |
| 8 | Regional governments or local authorities | 273 | 0 | 0 | 0 | 0 | 0 | 72 |
| 9 | Public sector entities | 34 | 0 | 0 | 0 | 0 | 0 | 97 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 320 | 0 | 0 |
| 12 | Institutions | 1 | 1 | 26 | 0 | 3 | 11 | 188 |
| 13 | Corporates | 141 | 531 | 71 | 55 | 19 | 267 | 5,266 |
| 14 | Retail | 60 | 0 | 6 | 603 | 1 | 8 | 0 |
| 15 | Secured by mortgages on immovable property | 213 | 1 | 6 | 0 | 83 | 69 | 25 |
| 16 | Exposures in default | 9 | 210 | 0 | 9 | 4 | 29 | 0 |
| 17 | Items associated with particularly high risk | 0 | 0 | 0 | 11 | 0 | 37 | 0 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | 124 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 2,656 | 1,301 | 110 | 749 | 1,594 | 3,063 | 6,010 |
| 24 | Total | 20,565 | 6,368 | 17,378 | 11,019 | 5,508 | 23,929 | 237,228 |

| | | Dec 31, 2017 | | | | | | |
|-----------|---|----------------|----------------|--------------|---------------------|---------------|--------------|--------------|
| | | o | p | q | r | s | t | u |
| | | North America | | | | Asia/Pacific | | |
| in € m. | | U.S. | Cayman Islands | Canada | Other North America | Asia/Pacific | Japan | Australia |
| 1 | Central governments and central banks | 87,276 | 0 | 61 | 18 | 15,269 | 5,377 | 917 |
| 2 | Institutions | 4,566 | 0 | 1,012 | 0 | 9,649 | 319 | 510 |
| 3 | Corporates | 123,469 | 2,262 | 2,224 | 7,654 | 39,303 | 1,359 | 2,257 |
| | of which: | | | | | | | |
| 3a | SMEs | 1,252 | 0 | 5 | 121 | 633 | 0 | 3 |
| 3b | Specialized lending | 14,725 | 113 | 218 | 163 | 2,140 | 516 | 257 |
| 3c | Other | 107,492 | 2,149 | 2,001 | 7,370 | 36,531 | 843 | 1,997 |
| 4 | Retail | 93 | 0 | 19 | 0 | 235 | 9 | 13 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 1 | 0 | 0 | 0 | 5 | 0 | 2 |
| 4b | Secured by real estate property non-SMEs | 71 | 0 | 5 | 0 | 129 | 8 | 7 |
| 4c | Qualifying revolving | 8 | 0 | 1 | 0 | 19 | 1 | 1 |
| 4d | Other retail SMEs | 7 | 0 | 3 | 0 | 12 | 0 | 1 |
| 4e | Other retail non-SMEs | 6 | 0 | 10 | 0 | 70 | 0 | 2 |
| 5 | Equity | 521 | 62 | 0 | 0 | 108 | 8 | 63 |
| 5a | Other non-credit obligation asset | 1,970 | 10 | 1 | 0 | 791 | 32 | 0 |
| 6 | Total IRB approach | 217,894 | 2,335 | 3,317 | 7,672 | 65,353 | 7,103 | 3,761 |
| 7 | Central governments or central banks | 207 | 0 | 30 | 0 | 142 | 0 | 0 |
| 8 | Regional governments or local authorities | 72 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Public sector entities | 97 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Institutions | 184 | 0 | 4 | 0 | 147 | 3 | 14 |
| 13 | Corporates | 4,284 | 445 | 115 | 423 | 663 | 4 | 21 |
| 14 | Retail | 0 | 0 | 0 | 0 | 689 | 6 | 3 |
| 15 | Secured by mortgages on immovable property | 24 | 0 | 2 | 0 | 1,261 | 0 | 0 |
| 16 | Exposures in default | 0 | 0 | 0 | 0 | 182 | 134 | 0 |
| 17 | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 11 | 0 | 0 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 124 | 0 | 0 | 0 | 14 | 0 | 14 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 4,992 | 445 | 150 | 423 | 3,111 | 147 | 52 |
| 24 | Total | 222,886 | 2,780 | 3,467 | 8,095 | 68,465 | 7,251 | 3,813 |

| | | Dec 31, 2017 | | | | | | |
|---------|---|--------------|-------|-----------|-----------|--------------------|--------------------------|---------|
| | | v | w | x | y | z | aa | ab |
| | | Asia/Pacific | | | | | Other geographical areas | Total |
| in € m. | | India | China | Singapore | Hong Kong | Other Asia/Pacific | | |
| 1 | Central governments and central banks | 1,869 | 1,088 | 1,426 | 303 | 4,288 | 1,858 | 116,542 |
| 2 | Institutions | 2,081 | 3,311 | 180 | 326 | 2,921 | 861 | 26,817 |
| 3 | Corporates | 6,835 | 3,415 | 5,593 | 5,332 | 14,512 | 7,845 | 362,630 |
| | of which: | | | | | | | |
| 3a | SMEs | 58 | 2 | 8 | 126 | 436 | 129 | 16,693 |
| 3b | Specialized lending | 319 | 0 | 202 | 173 | 672 | 78 | 32,345 |
| 3c | Other | 6,458 | 3,414 | 5,383 | 5,033 | 13,403 | 7,394 | 313,593 |
| 4 | Retail | 19 | 31 | 21 | 12 | 129 | 233 | 217,727 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 0 | 0 | 0 | 0 | 3 | 0 | 9,861 |
| 4b | Secured by real estate property non-SMEs | 2 | 21 | 17 | 10 | 65 | 36 | 156,716 |
| 4c | Qualifying revolving | 2 | 3 | 1 | 1 | 10 | 10 | 16,941 |
| 4d | Other retail SMEs | 1 | 3 | 1 | 1 | 5 | 7 | 5,739 |
| 4e | Other retail non-SMEs | 13 | 5 | 3 | 1 | 46 | 180 | 28,469 |
| 5 | Equity | 16 | 10 | 2 | 8 | 1 | 98 | 1,476 |
| 5a | Other non-credit obligation asset | 38 | 508 | 99 | 21 | 93 | 0 | 7,882 |
| 6 | Total IRB approach | 10,858 | 8,363 | 7,321 | 6,003 | 21,943 | 10,650 | 733,073 |
| 7 | Central governments or central banks | 2 | 23 | 2 | 3 | 112 | 0 | 153,171 |
| 8 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 0 | 0 | 12,208 |
| 9 | Public sector entities | 0 | 0 | 0 | 0 | 0 | 0 | 6,505 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 4,166 | 5,234 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 1,202 | 2,125 |
| 12 | Institutions | 9 | 16 | 10 | 26 | 70 | 79 | 1,796 |
| 13 | Corporates | 171 | 30 | 1 | 70 | 364 | 760 | 14,445 |
| 14 | Retail | 601 | 0 | 46 | 0 | 34 | 0 | 4,817 |
| 15 | Secured by mortgages on immovable property | 1,251 | 7 | 0 | 1 | 1 | 23 | 3,948 |
| 16 | Exposures in default | 46 | 0 | 2 | 1 | 0 | 2 | 1,014 |
| 17 | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 11 | 8 | 254 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | 140 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 124 |
| 23 | Total standardized approach | 2,080 | 76 | 61 | 101 | 593 | 6,240 | 205,781 |
| 24 | Total ¹ | 12,938 | 8,439 | 7,382 | 6,105 | 22,537 | 16,890 | 938,854 |

¹ The table reflects the fully loaded exposure view and therefore does not include the exposure shift from the advanced IRB to the standard approach of grandfathered equity investments.

Article 442 (e) CRR - Distribution of credit exposure by industry type

The table EU CRB-D below shows net credit exposures by industry and exposure classes. The industry sector breakdown in the columns below is consistent with table EU CR1-B. For on-balance sheet items the "net value of exposure" is calculated by deducting credit risk adjustments from the gross amount and for off-balance sheet exposures respective provisions have been deducted. The amounts shown are based on IFRS accounting values according to the regulatory scope of consolidation. The industry sector is defined using the first level of NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) codes per the descriptive headings.

The breakdown into the exposure classes follows those as defined for the IRBA (i.e., combining the advanced and foundation IRB) as well as for the standardized approach. In the IRB approach, the line item "Central governments and central banks" includes exposures to regional governments or local authorities, public sector entities, multilateral developments banks and international organizations. The exposure class "Other items" within the standardized approach includes all exposures not covered in the other categories.

EU CRB-D – Concentration of exposures by industry or counterparty types

| | | Dec 31, 2018 | | | | | | |
|---------|---|-----------------------------------|----------------------|---------------|---|---|--------------|--|
| | | a | b | c | d | e | f | g |
| in € m. | | Agriculture, forestry and fishing | Mining and quarrying | Manufacturing | Electricity, gas, steam and air conditioning supply | Water supply, sewerage, waste management and remediation activities | Construction | Wholesale and retail trade, repair of motor vehicles and motorcycles |
| 1 | Central governments and central banks | 0 | 0 | 0 | 0 | 0 | 44 | 0 |
| 2 | Institutions | 0 | 0 | 41 | 28 | 154 | 0 | 10 |
| 3 | Corporates | 923 | 11,246 | 88,049 | 10,508 | 919 | 7,990 | 35,959 |
| | of which: | | | | | | | |
| 3a | SMEs | 181 | 62 | 4,199 | 118 | 105 | 779 | 2,308 |
| 3b | Specialized lending | 1 | 114 | 372 | 1,119 | 0 | 831 | 143 |
| 3c | Other | 742 | 11,071 | 83,478 | 9,271 | 815 | 6,381 | 33,509 |
| 4 | Retail | 216 | 12 | 1,726 | 35 | 46 | 1,190 | 2,754 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 102 | 1 | 340 | 8 | 12 | 497 | 704 |
| 4b | Secured by real estate property non-SMEs | 32 | 3 | 267 | 5 | 4 | 258 | 473 |
| 4c | Qualifying revolving | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4d | Other retail SMEs | 64 | 6 | 967 | 18 | 26 | 329 | 1,192 |
| 4e | Other retail non-SMEs | 18 | 2 | 152 | 4 | 4 | 107 | 385 |
| 5 | Equity | 0 | 3 | 2 | 1 | 0 | 1 | 0 |
| 5a | Other non-credit obligation asset | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Total IRB approach | 1,139 | 11,261 | 89,818 | 10,571 | 1,120 | 9,226 | 38,723 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | Regional governments or local authorities | 0 | 0 | 5 | 0 | 164 | 1 | 0 |
| 9 | Public sector entities | 0 | 0 | 0 | 3 | 15 | 0 | 0 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Institutions | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Corporates | 2 | 10 | 725 | 31 | 38 | 174 | 729 |
| 14 | Retail | 6 | 1 | 221 | 2 | 2 | 26 | 152 |
| 15 | Secured by mortgages on immovable property | 51 | 6 | 451 | 5 | 2 | 60 | 473 |
| 16 | Exposures in default ¹ | 6 | 1 | 91 | 6 | 0 | 30 | 29 |
| 17 | Items associated with particularly high risk | 0 | 0 | 4 | 0 | 0 | 38 | 7 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 60 | 17 | 1,406 | 40 | 220 | 300 | 1,360 |
| 24 | Total | 1,199 | 11,278 | 91,224 | 10,611 | 1,340 | 9,525 | 40,084 |

| | | Dec 31, 2018 | | | | | | | |
|---------|---|----------------------------|---|-------------------------------|------------------------------------|------------------------|---|---|---|
| | | h | i | j | l | m | n | o | p |
| in € m. | | Transportation and storage | Accommodation and food service activities | Information and communication | Financial and insurance activities | Real estate activities | Professional, scientific and technical activities | Administrative and support service activities | Public administration and defense, compulsory social security |
| 1 | Central governments and central banks | 18 | 0 | 416 | 86,873 | 0 | 0 | 0 | 26,524 |
| 2 | Institutions | 44 | 0 | 11 | 25,023 | 94 | 205 | 0 | 529 |
| 3 | Corporates | 11,799 | 3,305 | 23,934 | 100,909 | 38,938 | 11,537 | 9,140 | 1,107 |
| | of which: | | | | | | | | |
| 3a | SMEs | 312 | 474 | 475 | 2,370 | 2,672 | 1,143 | 515 | 73 |
| 3b | Specialized lending | 2,339 | 599 | 79 | 6,890 | 20,374 | 234 | 952 | 334 |
| 3c | Other | 9,147 | 2,233 | 23,380 | 91,649 | 15,892 | 10,160 | 7,674 | 701 |
| 4 | Retail | 383 | 492 | 481 | 1,119 | 3,498 | 4,431 | 1,129 | 2 |
| | of which: | | | | | | | | |
| 4a | Secured by real estate property SMEs | 73 | 197 | 158 | 532 | 1,786 | 1,147 | 428 | 0 |
| 4b | Secured by real estate property non-SMEs | 79 | 116 | 136 | 193 | 1,481 | 2,353 | 338 | 0 |
| 4c | Qualifying revolving | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4d | Other retail SMEs | 183 | 121 | 133 | 72 | 138 | 568 | 223 | 1 |
| 4e | Other retail non-SMEs | 47 | 58 | 55 | 323 | 94 | 364 | 140 | 0 |
| 5 | Equity | 0 | 0 | 96 | 1,141 | 179 | 5 | 480 | 0 |
| 5a | Other non-credit obligation asset | 0 | 0 | 0 | 2,035 | 0 | 2 | 1,727 | 0 |
| 6 | Total IRB approach | 12,242 | 3,798 | 24,939 | 217,102 | 42,709 | 16,180 | 12,476 | 28,162 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 103,420 | 0 | 0 | 0 | 8,902 |
| 8 | Regional governments or local authorities | 6 | 0 | 0 | 0 | 12 | 2 | 0 | 9,867 |
| 9 | Public sector entities | 13 | 0 | 0 | 4,987 | 0 | 7 | 0 | 250 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 2,987 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 1,071 | 0 | 0 | 0 | 425 |
| 12 | Institutions | 0 | 0 | 0 | 1,281 | 0 | 0 | 2 | 0 |
| 13 | Corporates | 194 | 138 | 262 | 10,657 | 446 | 568 | 689 | 92 |
| 14 | Retail | 30 | 14 | 23 | 23 | 15 | 50 | 29 | 1 |
| | Secured by mortgages on immovable property | 60 | 42 | 41 | 229 | 309 | 112 | 31 | 0 |
| 16 | Exposures in default ¹ | 31 | 7 | 0 | 193 | 50 | 217 | 36 | 0 |
| 17 | Items associated with particularly high risk | 0 | 7 | 1 | 181 | 22 | 48 | 0 | 0 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 31 | 12 | 0 | 0 | 0 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 302 | 202 | 327 | 124,867 | 815 | 787 | 750 | 19,537 |
| 24 | Total | 12,545 | 4,000 | 25,266 | 341,968 | 43,524 | 16,967 | 13,227 | 47,699 |

| | | Dec 31, 2018 | | | | | | |
|---------|---|--------------|---|------------------------------------|--------------------------|--|---|----------------|
| | | q | r | s | t | u | v | w |
| in € m. | | Education | Human health and social work activities | Arts, entertainment and recreation | Other service activities | Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use | Activities of extraterritorial organizations and bodies | Total |
| 1 | Central governments and central banks | 0 | 0 | 0 | 4,453 | 0 | 116 | 118,444 |
| 2 | Institutions | 1 | 27 | 0 | 35 | 5 | 0 | 26,207 |
| 3 | Corporates | 498 | 2,780 | 1,556 | 2,004 | 18,263 | 10 | 381,377 |
| | of which: | | | | | | | |
| 3a | SMEs | 49 | 292 | 89 | 220 | 228 | 0 | 16,661 |
| 3b | Specialized lending | 0 | 12 | 84 | 28 | 295 | 0 | 34,797 |
| 3c | Other | 449 | 2,477 | 1,384 | 1,756 | 17,740 | 10 | 329,918 |
| 4 | Retail | 120 | 2,623 | 277 | 1,103 | 196,425 | 0 | 218,063 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 38 | 954 | 130 | 413 | 1,914 | 0 | 9,433 |
| 4b | Secured by real estate property non-SMEs | 39 | 419 | 70 | 248 | 149,783 | 0 | 156,297 |
| 4c | Qualifying revolving | 0 | 0 | 0 | 0 | 16,466 | 0 | 16,466 |
| 4d | Other retail SMEs | 24 | 727 | 44 | 126 | 733 | 0 | 5,698 |
| 4e | Other retail non-SMEs | 18 | 522 | 32 | 315 | 27,530 | 0 | 30,169 |
| 5 | Equity | 0 | 0 | 0 | 229 | 0 | 0 | 2,137 |
| 5a | Other non-credit obligation asset | 0 | 0 | 0 | 1,932 | 1,197 | 0 | 6,893 |
| 6 | Total IRB approach | 618 | 5,431 | 1,833 | 9,756 | 215,891 | 127 | 753,121 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 100 | 0 | 1 | 112,424 |
| 8 | Regional governments or local authorities | 0 | 1 | 2 | 22 | 3 | 0 | 10,085 |
| 9 | Public sector entities | 0 | 61 | 0 | 1 | 0 | 0 | 5,336 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 358 | 3,344 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 1,496 |
| 12 | Institutions | 0 | 0 | 0 | 0 | 129 | 0 | 1,412 |
| 13 | Corporates | 14 | 28 | 4 | 3,389 | 1,307 | 1 | 19,499 |
| 14 | Retail | 2 | 9 | 5 | 139 | 3,533 | 0 | 4,280 |
| 15 | Secured by mortgages on immovable property | 4 | 24 | 14 | 477 | 2,090 | 0 | 4,481 |
| 16 | Exposures in default ¹ | 0 | 0 | 1 | 80 | 160 | 0 | 938 |
| 17 | Items associated with particularly high risk | 0 | 0 | 0 | 1 | 31 | 0 | 339 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 7 | 0 | 0 | 50 |
| 22 | Other items | 0 | 0 | 0 | 12 | 0 | 0 | 12 |
| 23 | Total standardized approach | 19 | 123 | 26 | 4,149 | 7,093 | 360 | 162,758 |
| 24 | Total | 637 | 5,553 | 1,859 | 13,904 | 222,984 | 487 | 915,879 |

¹ In light of recent EBA guidance (Q&A 2017_3481) we have revised our approach to present the defaulted exposure within the standardized approach: We present the total of defaulted exposure in line 16 but also show a breakdown of defaulted exposure and assign it to their respective exposure classes. In order to avoid double counting of exposures, the total exposure of the standardized approach as presented in row 23 does not take into account figures disclosed under row 16. This new approach is applied for December 31, 2018, but not for the comparative numbers as of December 31, 2017.

| | | Dec 31, 2017 | | | | | | |
|---------|---|-----------------------------------|----------------------|---------------|---|---|--------------|--|
| | | a | b | c | d | e | f | g |
| in € m. | | Agriculture, forestry and fishing | Mining and quarrying | Manufacturing | Electricity, gas, steam and air conditioning supply | Water supply, sewerage, waste management and remediation activities | Construction | Wholesale and retail trade, repair of motor vehicles and motorcycles |
| 1 | Central governments and central banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Institutions | 0 | 0 | 38 | 0 | 0 | 0 | 30 |
| 3 | Corporates | 1,163 | 9,059 | 78,701 | 4,916 | 1,079 | 9,497 | 28,213 |
| | of which: | | | | | | | |
| 3a | SMEs | 182 | 97 | 4,248 | 33 | 113 | 689 | 1,897 |
| 3b | Specialized lending | 1 | 13 | 341 | 223 | 0 | 940 | 121 |
| 3c | Other | 980 | 8,950 | 74,112 | 4,659 | 966 | 7,868 | 26,195 |
| 4 | Retail | 230 | 16 | 1,883 | 14 | 52 | 1,166 | 2,440 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 112 | 1 | 396 | 3 | 15 | 485 | 655 |
| 4b | Secured by real estate property non-SMEs | 32 | 4 | 292 | 2 | 5 | 242 | 436 |
| 4c | Qualifying revolving | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4d | Other retail SMEs | 67 | 8 | 994 | 7 | 28 | 294 | 1,045 |
| 4e | Other retail non-SMEs | 19 | 3 | 201 | 2 | 5 | 144 | 303 |
| 5 | Equity | 0 | 4 | 18 | 0 | 0 | 1 | 0 |
| 5a | Other non-credit obligation asset | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Total IRB approach | 1,393 | 9,079 | 80,640 | 4,930 | 1,131 | 10,664 | 30,682 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Public sector entities | 0 | 0 | 0 | 4 | 19 | 0 | 0 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Institutions | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Corporates | 7 | 20 | 785 | 2 | 39 | 167 | 566 |
| 14 | Retail | 3 | 2 | 187 | 1 | 3 | 28 | 122 |
| 15 | Secured by mortgages on immovable property | 71 | 3 | 384 | 3 | 2 | 47 | 320 |
| 16 | Exposures in default | 19 | 0 | 129 | 0 | 1 | 4 | 25 |
| 17 | Items associated with particularly high risk | 0 | 0 | 9 | 0 | 0 | 92 | 15 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 100 | 26 | 1,494 | 10 | 63 | 338 | 1,049 |
| 24 | Total | 1,493 | 9,105 | 82,134 | 4,940 | 1,194 | 11,002 | 31,731 |

| | | Dec 31, 2017 | | | | | | | |
|---------|---|----------------------------|---|-------------------------------|------------------------------------|------------------------|---|---|---|
| in € m. | | h | i | j | l | m | n | o | p |
| | | Transportation and storage | Accommodation and food service activities | Information and communication | Financial and insurance activities | Real estate activities | Professional, scientific and technical activities | Administrative and support service activities | Public administration and defense, compulsory social security |
| 1 | Central governments and central banks | 0 | 0 | 0 | 92,074 | 0 | 0 | 0 | 24,026 |
| 2 | Institutions | 0 | 0 | 0 | 24,747 | 0 | 0 | 0 | 2,002 |
| 3 | Corporates | 12,792 | 3,645 | 21,512 | 85,037 | 32,376 | 9,226 | 7,213 | 1,447 |
| | of which: | | | | | | | | |
| 3a | SMEs | 346 | 512 | 281 | 2,227 | 2,254 | 1,095 | 510 | 69 |
| 3b | Specialized lending | 3,363 | 728 | 0 | 2,680 | 19,542 | 158 | 710 | 191 |
| 3c | Other | 9,082 | 2,405 | 21,231 | 80,130 | 10,579 | 7,973 | 5,994 | 1,186 |
| 4 | Retail | 393 | 500 | 489 | 1,053 | 876 | 4,505 | 1,155 | 2 |
| | of which: | | | | | | | | |
| 4a | Secured by real estate property SMEs | 79 | 195 | 152 | 490 | 485 | 1,151 | 448 | 0 |
| 4b | Secured by real estate property non-SMEs | 81 | 123 | 142 | 183 | 367 | 2,404 | 353 | 0 |
| 4c | Qualifying revolving | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4d | Other retail SMEs | 179 | 114 | 136 | 66 | 13 | 557 | 208 | 1 |
| 4e | Other retail non-SMEs | 53 | 69 | 59 | 313 | 10 | 393 | 146 | 1 |
| 5 | Equity | 0 | 0 | 21 | 896 | 201 | 14 | 37 | 3 |
| 5a | Other non-credit obligation asset | 0 | 0 | 1 | 1,737 | 0 | 0 | 2,052 | 0 |
| 6 | Total IRB approach | 13,185 | 4,146 | 22,022 | 205,544 | 33,453 | 13,746 | 10,457 | 27,481 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 132,852 | 0 | 0 | 0 | 20,319 |
| 8 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 12,194 |
| 9 | Public sector entities | 0 | 0 | 0 | 6,143 | 0 | 4 | 0 | 286 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 4,637 | 0 | 0 | 0 | 0 |
| 11 | International organizations | 0 | 0 | 0 | 603 | 0 | 0 | 0 | 1,522 |
| 12 | Institutions | 0 | 0 | 0 | 1,796 | 0 | 0 | 0 | 0 |
| 13 | Corporates | 215 | 34 | 379 | 4,661 | 526 | 253 | 1,228 | 0 |
| 14 | Retail | 37 | 14 | 22 | 20 | 0 | 48 | 199 | 1 |
| | Secured by mortgages on immovable property | 45 | 36 | 29 | 193 | 152 | 38 | 26 | 3 |
| 16 | Exposures in default | 14 | 2 | 2 | 69 | 102 | 160 | 60 | 3 |
| 17 | Items associated with particularly high risk | 0 | 4 | 1 | 41 | 12 | 8 | 1 | 0 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 55 | 6 | 0 | 5 | 0 |
| 22 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Total standardized approach | 312 | 89 | 432 | 151,069 | 810 | 511 | 1,518 | 34,329 |
| 24 | Total | 13,497 | 4,234 | 22,455 | 356,613 | 34,263 | 14,256 | 11,975 | 61,810 |

| | | Dec 31, 2017 | | | | | | |
|---------|---|--------------|---|------------------------------------|--------------------------|--|---|---------|
| | | q | r | s | t | u | v | w |
| in € m. | | Education | Human health and social work activities | Arts, entertainment and recreation | Other service activities | Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use | Activities of extraterritorial organizations and bodies | Total |
| 1 | Central governments and central banks | 0 | 0 | 0 | 0 | 0 | 441 | 116,542 |
| 2 | Institutions | 0 | 0 | 0 | 0 | 0 | 0 | 26,817 |
| 3 | Corporates | 413 | 3,558 | 2,309 | 31,483 | 18,991 | 0 | 362,630 |
| | of which: | | | | | | | |
| 3a | SMEs | 57 | 422 | 54 | 1,188 | 419 | 0 | 16,693 |
| 3b | Specialized lending | 0 | 1 | 26 | 3,023 | 284 | 0 | 32,345 |
| 3c | Other | 355 | 3,136 | 2,230 | 27,273 | 18,288 | 0 | 313,593 |
| 4 | Retail | 127 | 2,800 | 276 | 1,511 | 198,238 | 0 | 217,727 |
| | of which: | | | | | | | |
| 4a | Secured by real estate property SMEs | 41 | 1,042 | 125 | 552 | 3,434 | 0 | 9,861 |
| 4b | Secured by real estate property non-SMEs | 43 | 440 | 71 | 331 | 151,166 | 0 | 156,716 |
| 4c | Qualifying revolving | 0 | 0 | 0 | 0 | 16,941 | 0 | 16,941 |
| 4d | Other retail SMEs | 25 | 748 | 43 | 311 | 895 | 0 | 5,739 |
| 4e | Other retail non-SMEs | 19 | 570 | 38 | 317 | 25,802 | 0 | 28,469 |
| 5 | Equity | 0 | 0 | 0 | 281 | 0 | 0 | 1,476 |
| 5a | Other non-credit obligation asset | 0 | 0 | 0 | 4,091 | 0 | 0 | 7,882 |
| 6 | Total IRB approach | 540 | 6,358 | 2,586 | 37,367 | 217,229 | 442 | 733,073 |
| 7 | Central governments or central banks | 0 | 0 | 0 | 0 | 0 | 0 | 153,171 |
| 8 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 0 | 0 | 12,208 |
| 9 | Public sector entities | 0 | 50 | 0 | 0 | 0 | 0 | 6,505 |
| 10 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 597 | 5,234 |
| 11 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 2,125 |
| 12 | Institutions | 0 | 0 | 0 | 0 | 0 | 0 | 1,796 |
| 13 | Corporates | 3 | 41 | 6 | 5,181 | 334 | 0 | 14,445 |
| 14 | Retail | 2 | 11 | 4 | 72 | 4,040 | 0 | 4,817 |
| 15 | Secured by mortgages on immovable property | 3 | 17 | 20 | 460 | 2,097 | 0 | 3,948 |
| 16 | Exposures in default | 4 | 0 | 3 | 139 | 278 | 0 | 1,014 |
| 17 | Items associated with particularly high risk | 0 | 0 | 0 | 24 | 47 | 0 | 254 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 73 | 0 | 0 | 140 |
| 22 | Other items | 0 | 0 | 0 | 124 | 0 | 0 | 124 |
| 23 | Total standardized approach | 12 | 120 | 32 | 6,072 | 6,797 | 597 | 205,781 |
| 24 | Total ¹ | 552 | 6,478 | 2,617 | 43,440 | 224,026 | 1,039 | 938,854 |

¹ The table reflects the fully loaded exposure view and therefore does not include the exposure shift from the advanced IRB to the standard approach of grandfathered equity investments.

Article 442 (f) CRR - Residual maturity breakdown of credit exposure

The table EU CRB-E below shows net credit exposures by maturities and exposure classes. Here exposure refers to on-balance sheet (excluding off-balance sheet exposure) items wherein the "net value of exposure" is calculated by deducting credit risk adjustments from the gross amount. The net exposure is split into 5 categories based on the residual contractual maturity. Below are the categories

- On Demand – where the counterparty has a choice of when the amount is repaid
- Bucketing – 0 to 1 year, 1 to 5 years and more than 5 years
- No stated maturity – where an exposure has no stated maturity for reasons other than the counterparty having the choice of the repayment date

The breakdown into the exposure classes follows those as defined for the IRBA (i.e., combining the advanced and foundation IRB) as well as for the standardized approach. In the IRB approach, the line item "Central governments and central banks" includes exposures to regional governments or local authorities, public sector entities, multilateral developments banks and

international organizations. The exposure class "Other items" within the standardized approach includes all exposures not covered in the other categories.

EU CRB-E – Maturity of exposures

| | | | | | | Dec 31, 2018 | |
|---------|---|---------------|----------------|----------------|----------------|------------------------|----------------|
| | | | | | | f | |
| | | | | | | Net exposure value | |
| | | | | | | e | |
| | | | | | | d | |
| | | | | | | c | |
| | | | | | | b | |
| | | | | | | a | |
| | | | | | | On demand | |
| | | | | | | <= 1 year | |
| | | | | | | > 1 year <= 5 years | |
| | | | | | | > 5 years | |
| | | | | | | No stated maturity | |
| | | | | | | Total | |
| in € m. | | | | | | | |
| 1 | Central governments and central banks | 57,401 | 36,096 | 10,967 | 13,317 | 18 | 117,799 |
| 2 | Institutions | 878 | 12,310 | 2,990 | 2,763 | 592 | 19,533 |
| 3 | Corporates | 6,426 | 85,028 | 58,955 | 29,772 | 3,516 | 183,696 |
| | of which: | | | | | | |
| 3a | SMEs | 358 | 3,444 | 1,986 | 4,962 | 3 | 10,754 |
| 3b | Specialized lending | 1,378 | 8,168 | 13,977 | 6,853 | 0 | 30,376 |
| 3c | Other | 4,690 | 73,416 | 42,991 | 17,956 | 3,513 | 142,566 |
| 4 | Retail | 1,099 | 6,841 | 18,251 | 159,732 | 2,093 | 188,016 |
| | of which: | | | | | | |
| 4a | Secured by real estate property SMEs | 7 | 231 | 774 | 7,871 | 0 | 8,882 |
| 4b | Secured by real estate property non-SMEs | 259 | 1,984 | 7,865 | 136,606 | 1,544 | 148,258 |
| 4c | Qualifying revolving | 576 | 431 | 0 | 0 | 0 | 1,007 |
| 4d | Other retail SMEs | 136 | 1,589 | 1,139 | 668 | 220 | 3,752 |
| 4e | Other retail non-SMEs | 121 | 2,606 | 8,473 | 14,587 | 330 | 26,116 |
| 5 | Equity | 274 | 1,341 | 17 | 485 | 0 | 2,117 |
| 5a | Other non-credit obligation asset | 9 | 3,943 | 976 | 6 | 1,955 | 6,890 |
| 6 | Total IRB approach | 66,087 | 145,559 | 92,156 | 206,075 | 8,174 | 518,050 |
| 7 | Central governments or central banks | 2,745 | 99,990 | 5,207 | 2,704 | 1,765 | 112,412 |
| 8 | Regional governments or local authorities | 9 | 2,836 | 4,550 | 2,352 | 0 | 9,748 |
| 9 | Public sector entities | 59 | 915 | 2,124 | 2,199 | 2 | 5,300 |
| 10 | Multilateral development banks | 0 | 445 | 1,712 | 1,187 | 0 | 3,344 |
| 11 | International organizations | 0 | 528 | 672 | 296 | 0 | 1,496 |
| 12 | Institutions | 25 | 25 | 217 | 941 | 187 | 1,395 |
| 13 | Corporates | 596 | 8,955 | 4,075 | 1,601 | 545 | 15,773 |
| 14 | Retail | 338 | 426 | 882 | 1,033 | 287 | 2,966 |
| 15 | Secured by mortgages on immovable property | 15 | 1,008 | 617 | 2,635 | 2 | 4,276 |
| 16 | Exposures in default ¹ | 66 | 415 | 59 | 370 | 21 | 931 |
| 17 | Items associated with particularly high risk | 25 | 7 | 190 | 93 | 0 | 314 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 0 | 0 | 50 | 0 | 50 |
| 22 | Other items | 0 | 12 | 0 | 0 | 0 | 12 |
| 23 | Total standardized approach | 3,812 | 115,147 | 20,246 | 15,091 | 2,789 | 157,084 |
| 24 | Total | 69,900 | 260,706 | 112,402 | 221,165 | 10,962 | 675,135 |

¹ In light of recent EBA guidance (Q&A 2017_3481) we have revised our approach to present the defaulted exposure within the standardized approach: We present the total of defaulted exposure in line 16 but also show a breakdown of defaulted exposure and assign it to their respective exposure classes. In order to avoid double counting of exposures, the total exposure of the standardized approach as presented in row 23 does not take into account figures disclosed under row 16. This new approach is applied for December 31, 2018, but not for the comparative numbers as of December 31, 2017.

| | | Dec 31, 2017 | | | | | |
|-----------|---|--------------------|----------------|------------------------|----------------|-----------------------|----------------|
| | | a | b | c | d | e | f |
| | | Net exposure value | | | | | |
| in € m. | | On demand | <= 1 year | > 1 year <= 5 years | > 5 years | No stated maturity | Total |
| 1 | Central governments and central banks | 87,867 | 6,083 | 5,429 | 12,694 | 1 | 112,073 |
| 2 | Institutions | 956 | 13,829 | 3,018 | 3,496 | 33 | 21,331 |
| 3 | Corporates | 8,710 | 82,486 | 52,995 | 27,896 | 2,857 | 174,944 |
| | of which: | | | | | | |
| 3a | SMEs | 470 | 3,364 | 2,311 | 4,433 | 16 | 10,594 |
| 3b | Specialized lending | 1,969 | 7,923 | 13,502 | 5,871 | 0 | 29,266 |
| 3c | Other | 6,271 | 71,198 | 37,182 | 17,591 | 2,842 | 135,084 |
| 4 | Retail | 2,110 | 6,868 | 18,271 | 157,974 | 2,463 | 187,687 |
| | of which: | | | | | | |
| 4a | Secured by real estate property SMEs | 6 | 283 | 816 | 8,178 | 0 | 9,282 |
| 4b | Secured by real estate property non-SMEs | 1,134 | 2,427 | 8,145 | 135,685 | 1,868 | 149,259 |
| 4c | Qualifying revolving | 584 | 440 | 0 | 0 | 0 | 1,024 |
| 4d | Other retail SMEs | 118 | 1,504 | 1,174 | 714 | 228 | 3,737 |
| 4e | Other retail non-SMEs | 269 | 2,214 | 8,137 | 13,397 | 367 | 24,385 |
| 5 | Equity | 37 | 1,126 | 8 | 288 | 0 | 1,459 |
| 5a | Other non-credit obligation asset | 877 | 3,554 | 1,071 | 0 | 2,378 | 7,881 |
| 6 | Total IRB approach | 100,557 | 113,946 | 80,793 | 202,348 | 7,732 | 505,375 |
| 7 | Central governments or central banks | 114,297 | 21,819 | 9,290 | 6,894 | 843 | 153,142 |
| 8 | Regional governments or local authorities | 64 | 2,684 | 5,599 | 3,449 | 3 | 11,798 |
| 9 | Public sector entities | 24 | 655 | 3,067 | 2,711 | 21 | 6,478 |
| 10 | Multilateral development banks | 0 | 701 | 3,274 | 1,260 | 0 | 5,234 |
| 11 | International organizations | 0 | 733 | 785 | 608 | 0 | 2,125 |
| 12 | Institutions | 53 | 68 | 370 | 1,207 | 74 | 1,772 |
| 13 | Corporates | 1,914 | 3,048 | 3,495 | 1,302 | 242 | 10,001 |
| 14 | Retail | 289 | 336 | 1,236 | 1,381 | 263 | 3,505 |
| 15 | Secured by mortgages on immovable property | 15 | 814 | 391 | 2,546 | 3 | 3,768 |
| 16 | Exposures in default | 157 | 499 | 144 | 199 | 0 | 999 |
| 17 | Items associated with particularly high risk | 62 | 28 | 31 | 126 | 0 | 247 |
| 18 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Equity exposures | 0 | 9 | 0 | 132 | 0 | 140 |
| 22 | Other items | 31 | 93 | 0 | 0 | 0 | 124 |
| 23 | Total standardized approach | 116,905 | 31,485 | 27,597 | 21,898 | 1,449 | 199,333 |
| 24 | Total¹ | 217,462 | 145,430 | 108,389 | 224,246 | 9,181 | 704,708 |

¹ The table reflects the fully loaded exposure view and therefore does not include the exposure shift from the advanced IRB to the standard approach of grandfathered equity investments.

Article 442 (g) CRR - Defaulted exposures by regulatory exposure class and industry

Tables EU CR1-A and EU CR1-B provide asset quality information of the Group's on- and off-balance sheet exposures subject to the credit risk framework broken down by regulatory exposure classes and industries respectively.

The industry classification is based on NACE codes (NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) is a European industry standard classification system for classifying business activities).

The amounts shown below are based on IFRS accounting values according to the regulatory scope of consolidation. An exposure is being classified as defaulted if the default criteria according to Article 178 CRR are met. As confirmed by EBA (EBA/OP/2017/02) specific credit risk adjustments consist of all types of allowance for credit losses held against financial instruments subject to impairment according to IFRS 9 for the current fiscal year (IAS 39 for the prior fiscal year). The Group does not record any credit risk adjustment which qualify as general credit risk adjustment. The credit risk adjustment charges of the period are provided for a six month period in column "f".

EU CR1-A – Credit quality of exposures by exposure class and instrument

| | | | | | | | | Dec 31, 2018 | | | | | | |
|---------|--|-------------------------|---------------------------------|--------------------------------|------------------------|---|----------------------|--------------------------|---|---|---|---|---|---|
| | | | | | | | | a | b | c | d | e | f | g |
| | | | | | | | | Gross carrying values of | | | | | | |
| in € m. | Defaulted exposures | Non-defaulted exposures | Specific credit risk adjustment | General credit risk adjustment | Accumulated write-offs | Credit risk adjustment charges of the period six months ended Dec 31, 2018 ¹ | Net values (a+b-c-d) | | | | | | | |
| 1 | Central governments and central banks | 87 | 118,377 | 19 | 0 | 0 | 118,444 | | | | | | | |
| 2 | Institutions | 23 | 26,195 | 11 | 0 | 0 | 26,207 | | | | | | | |
| 3 | Corporates | 4,901 | 378,166 | 1,690 | 0 | 496 | 381,377 | | | | | | | |
| | Of which: | | | | | | | | | | | | | |
| 5 | SMEs | 474 | 16,411 | 223 | 0 | 4 | 16,661 | | | | | | | |
| 4 | Specialized Lending | 1,545 | 33,532 | 279 | 0 | 224 | 34,797 | | | | | | | |
| 5a | Other | 2,882 | 328,224 | 1,188 | 0 | 269 | 329,918 | | | | | | | |
| 6 | Retail | 3,713 | 216,626 | 2,275 | 0 | 628 | 218,063 | | | | | | | |
| | Of which: | | | | | | | | | | | | | |
| 8 | Secured by real estate property SMEs | 120 | 9,377 | 64 | 0 | 3 | 9,433 | | | | | | | |
| 9 | Secured by real estate property Non-SMEs | 1,608 | 155,268 | 579 | 0 | 40 | 156,297 | | | | | | | |
| 10 | Qualifying Revolving | 71 | 16,474 | 80 | 0 | 13 | 16,466 | | | | | | | |
| 12 | Other SMEs | 250 | 5,666 | 218 | 0 | 51 | 5,698 | | | | | | | |
| 13 | Other Non-SMEs | 1,664 | 29,840 | 1,335 | 0 | 521 | 30,169 | | | | | | | |
| 14 | Equity | 1 | 2,135 | 0 | 0 | 0 | 2,137 | | | | | | | |
| 14a | Other non-credit obligation asset | 0 | 6,894 | 0 | 0 | 0 | 6,893 | | | | | | | |
| 15 | Total IRB approach | 8,724 | 748,393 | 3,996 | 0 | 1,124 | 753,121 | | | | | | | |
| 16 | Central governments or central banks | 0 | 112,425 | 2 | 0 | 0 | 112,424 | | | | | | | |
| 17 | Regional governments or local authorities | 0 | 10,088 | 3 | 0 | 0 | 10,085 | | | | | | | |
| 18 | Public sector entities | 3 | 5,333 | 1 | 0 | 0 | 5,336 | | | | | | | |
| 19 | Multilateral Development Banks | 0 | 3,344 | 0 | 0 | 0 | 3,344 | | | | | | | |
| 20 | International Organizations | 0 | 1,496 | 0 | 0 | 0 | 1,496 | | | | | | | |
| 21 | Institutions | 0 | 1,423 | 11 | 0 | 0 | 1,412 | | | | | | | |
| 22 | Corporates | 583 | 18,982 | 66 | 0 | 123 | 19,499 | | | | | | | |
| 24 | Retail | 433 | 4,178 | 331 | 0 | 169 | 4,280 | | | | | | | |
| 26 | Secured by mortgages on immovable property | 179 | 4,315 | 13 | 0 | 0 | 4,481 | | | | | | | |
| 28 | Exposures in default ² | 1,414 | 0 | 476 | 0 | 0 | 938 | | | | | | | |
| 29 | Items associated with particularly high risk | 216 | 264 | 141 | 0 | 0 | 339 | | | | | | | |
| 30 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| 31 | Claims on institutions and corporates with a short- term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| 32 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| 33 | Equity exposures | 0 | 50 | 0 | 0 | 0 | 50 | | | | | | | |
| 34 | Other items | 0 | 12 | 0 | 0 | 0 | 12 | | | | | | | |
| 35 | Total standardized approach | 1,414 | 161,911 | 568 | 0 | 293 | 162,758 | | | | | | | |
| 36 | Total | 10,139 | 910,304 | 4,564 | 0 | 1,416 | 915,879 | | | | | | | |
| | Of which: | | | | | | | | | | | | | |
| 37 | Loans | 9,119 | 389,831 | 4,180 | 0 | 1,416 | 394,771 | | | | | | | |
| 38 | Debt Securities | 121 | 57,335 | 10 | 0 | 0 | 57,447 | | | | | | | |
| 39 | Off-balance sheet exposures | 721 | 240,290 | 283 | 0 | 0 | 240,728 | | | | | | | |

¹ Credit risk adjustment charges of the period do not include recoveries.

² In light of recent EBA guidance (Q&A 2017_3481) we have revised our approach to present the defaulted exposure within the standardized approach: We present the total of defaulted exposure in line 28 but also show a breakdown of defaulted exposure and assign it to their respective exposure classes. In order to avoid double counting of exposures, the total exposure of the standardized approach as presented in row 35 does not take into account figures disclosed under row 28. This new approach is applied for December 31, 2018, but not for the comparative numbers as of June 30, 2018.

| | | | | | | | Jun 30, 2018 | | | | | | |
|---------|--|-------------------------|---------------------------------|--------------------------------|------------------------|---|--------------------------|---|---|---|---|---|---|
| | | | | | | | a | b | c | d | e | f | g |
| | | | | | | | Gross carrying values of | | | | | | |
| in € m. | Defaulted exposures | Non-defaulted exposures | Specific credit risk adjustment | General credit risk adjustment | Accumulated write-offs | Credit risk adjustment charges of the period six months ended Jun 30, 2018 ¹ | Net values (a+b-c-d) | | | | | | |
| 1 | Central governments and central banks | 118 | 118,637 | 15 | 0 | 0 | 118,740 | | | | | | |
| 2 | Institutions | 27 | 26,716 | 7 | 0 | 2 | 26,736 | | | | | | |
| 3 | Corporates | 6,389 | 367,913 | 1,866 | 0 | 18 | 372,436 | | | | | | |
| | Of which: | | | | | | | | | | | | |
| 5 | SMEs | 559 | 17,882 | 259 | 0 | 12 | 18,183 | | | | | | |
| 4 | Specialized Lending | 1,763 | 33,036 | 455 | 0 | (21) | 34,344 | | | | | | |
| 5a | Other | 4,067 | 316,994 | 1,151 | 0 | 27 | 319,910 | | | | | | |
| 6 | Retail | 3,703 | 218,183 | 2,241 | 0 | 269 | 219,645 | | | | | | |
| | Of which: | | | | | | | | | | | | |
| 8 | Secured by real estate property SMEs | 100 | 9,818 | 47 | 0 | 10 | 9,871 | | | | | | |
| 9 | Secured by real estate property Non-SMEs | 1,627 | 156,640 | 610 | 0 | 106 | 157,657 | | | | | | |
| 10 | Qualifying Revolving | 64 | 16,698 | 82 | 0 | 7 | 16,680 | | | | | | |
| 12 | Other SMEs | 267 | 5,940 | 218 | 0 | 18 | 5,989 | | | | | | |
| 13 | Other Non-SMEs | 1,644 | 29,087 | 1,283 | 0 | 128 | 29,448 | | | | | | |
| 14 | Equity | 0 | 1,666 | 0 | 0 | 0 | 1,666 | | | | | | |
| 14a | Other non-credit obligation asset | 0 | 6,469 | 0 | 0 | 1 | 6,468 | | | | | | |
| 15 | Total IRB approach | 10,238 | 739,583 | 4,129 | 0 | 289 | 745,692 | | | | | | |
| 16 | Central governments or central banks | 0 | 124,377 | 2 | 0 | 0 | 124,375 | | | | | | |
| 17 | Regional governments or local authorities | 0 | 10,499 | 4 | 0 | 3 | 10,495 | | | | | | |
| 18 | Public sector entities | 0 | 6,197 | 2 | 0 | (1) | 6,196 | | | | | | |
| 19 | Multilateral Development Banks | 0 | 3,932 | 0 | 0 | 0 | 3,931 | | | | | | |
| 20 | International Organizations | 0 | 1,672 | 0 | 0 | 0 | 1,672 | | | | | | |
| 21 | Institutions | 0 | 1,679 | 10 | 0 | 0 | 1,669 | | | | | | |
| 22 | Corporates | 0 | 19,103 | 27 | 0 | (8) | 19,076 | | | | | | |
| 24 | Retail | 0 | 4,572 | 45 | 0 | 17 | 4,527 | | | | | | |
| 26 | Secured by mortgages on immovable property | 0 | 4,094 | 10 | 0 | 0 | 4,083 | | | | | | |
| 28 | Exposures in default | 1,362 | 0 | 425 | 0 | 26 | 937 | | | | | | |
| 29 | Items associated with particularly high risk | 244 | 119 | 162 | 0 | 5 | 201 | | | | | | |
| 30 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 31 | Claims on institutions and corporates with a short- term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 32 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 33 | Equity exposures | 0 | 195 | 0 | 0 | 0 | 195 | | | | | | |
| 34 | Other items | 0 | 2 | 0 | 0 | 0 | 2 | | | | | | |
| 35 | Total standardized approach | 1,606 | 176,440 | 687 | 0 | 107 | 177,359 | | | | | | |
| 36 | Total | 11,843 | 916,023 | 4,816 | 0 | 301 | 923,051 | | | | | | |
| | Of which: | | | | | | | | | | | | |
| 37 | Loans | 9,953 | 380,410 | 4,480 | 0 | 298 | 385,883 | | | | | | |
| 38 | Debt Securities | 152 | 57,083 | 13 | 0 | 1 | 57,222 | | | | | | |
| 39 | Off-balance sheet exposures | 1,046 | 239,119 | 322 | 0 | 3 | 239,842 | | | | | | |

¹ Credit risk adjustment charges of the period do not include recoveries.

EU CR1-B – Credit quality of exposures by industry

| | | | | | | | | Dec 31, 2018 | | | | | | |
|-----------|--|-------------------------|---------------------------------|--------------------------------|------------------------|---|----------------------|--------------------------|---|---|---|---|---|---|
| | | | | | | | | a | b | c | d | e | f | g |
| | | | | | | | | Gross carrying values of | | | | | | |
| in € m. | Defaulted exposures | Non-defaulted exposures | Specific credit risk adjustment | General credit risk adjustment | Accumulated write-offs | Credit risk adjustment charges of the period six months ended Dec 31, 2018 ¹ | Net values (a+b-c-d) | | | | | | | |
| 1 | Agriculture, forestry and fishing | 77 | 1,146 | 25 | 0 | 3 | 1 | 1,199 | | | | | | |
| 2 | Mining and quarrying | 195 | 11,109 | 26 | 0 | 24 | 14 | 11,278 | | | | | | |
| 3 | Manufacturing | 988 | 90,803 | 567 | 0 | 137 | 54 | 91,224 | | | | | | |
| 4 | Electricity, gas, steam and air conditioning supply | 90 | 10,551 | 30 | 0 | 2 | (4) | 10,611 | | | | | | |
| 5 | Water supply, sewerage, waste management and remediation activities | 11 | 1,337 | 8 | 0 | 0 | 0 | 1,340 | | | | | | |
| 6 | Construction | 541 | 9,278 | 294 | 0 | 46 | 19 | 9,525 | | | | | | |
| 7 | Wholesale and retail trade, repair of motor vehicles and motorcycles | 719 | 39,830 | 465 | 0 | 119 | 18 | 40,084 | | | | | | |
| 8 | Transport and storage | 612 | 12,153 | 221 | 0 | 308 | 23 | 12,545 | | | | | | |
| 9 | Accommodation and food service activities | 144 | 3,881 | 26 | 0 | 3 | 1 | 4,000 | | | | | | |
| 10 | Information and communication | 58 | 25,280 | 72 | 0 | 10 | 15 | 25,266 | | | | | | |
| 10a | Financial and insurance activities | 1,245 | 341,052 | 328 | 0 | 19 | 113 | 341,968 | | | | | | |
| 11 | Real estate activities | 824 | 42,859 | 159 | 0 | 23 | 35 | 43,524 | | | | | | |
| 12 | Professional, scientific and technical activities | 364 | 16,709 | 107 | 0 | 44 | (10) | 16,967 | | | | | | |
| 13 | Administrative and support service activities | 133 | 13,128 | 35 | 0 | 12 | 7 | 13,227 | | | | | | |
| 14 | Public administration and defense, compulsory social security | 88 | 47,632 | 21 | 0 | 1 | 1 | 47,699 | | | | | | |
| 15 | Education | 8 | 637 | 9 | 0 | 6 | 0 | 637 | | | | | | |
| 16 | Human health services and social work activities | 30 | 5,545 | 21 | 0 | 0 | (3) | 5,553 | | | | | | |
| 17 | Arts, entertainment and recreation | 14 | 1,855 | 10 | 0 | 4 | 1 | 1,859 | | | | | | |
| 18 | Other service activities | 154 | 13,799 | 49 | 0 | 7 | 9 | 13,904 | | | | | | |
| 18a | Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use | 3,842 | 221,234 | 2,092 | 0 | 648 | 72 | 222,984 | | | | | | |
| 18b | Activities of extraterritorial organizations and bodies | 1 | 486 | 1 | 0 | 0 | 0 | 487 | | | | | | |
| 19 | Total | 10,139 | 910,304 | 4,564 | 0 | 1,416 | 368 | 915,879 | | | | | | |

¹ Credit risk adjustment charges of the period do not include recoveries.

| | | | | | | | Jun 30, 2018 | | | | | | |
|-----------|--|-------------------------|---------------------------------|--------------------------------|------------------------|---|--------------------------|----------------|---|---|---|---|---|
| | | | | | | | a | b | c | d | e | f | g |
| | | | | | | | Gross carrying values of | | | | | | |
| in € m. | Defaulted exposures | Non-defaulted exposures | Specific credit risk adjustment | General credit risk adjustment | Accumulated write-offs | Credit risk adjustment charges of the period six months ended Jun 30, 2018 ¹ | Net values (a+b-c-d) | | | | | | |
| 1 | Agriculture, forestry and fishing | 86 | 1,475 | 27 | 0 | 2 | 5 | 1,533 | | | | | |
| 2 | Mining and quarrying | 505 | 10,078 | 52 | 0 | 19 | (7) | 10,531 | | | | | |
| 3 | Manufacturing | 1,554 | 87,458 | 573 | 0 | 82 | 24 | 88,439 | | | | | |
| 4 | Electricity, gas, steam and air conditioning supply | 102 | 11,279 | 34 | 0 | 2 | 13 | 11,348 | | | | | |
| 5 | Water supply, sewerage, waste management and remediation activities | 61 | 1,491 | 9 | 0 | 0 | 0 | 1,543 | | | | | |
| 6 | Construction | 592 | 11,397 | 319 | 0 | 26 | (2) | 11,670 | | | | | |
| 7 | Wholesale and retail trade, repair of motor vehicles and motorcycles | 735 | 37,255 | 461 | 0 | 158 | 49 | 37,530 | | | | | |
| 8 | Transport and storage | 1,007 | 12,182 | 386 | 0 | 94 | 4 | 12,803 | | | | | |
| 9 | Accommodation and food service activities | 75 | 4,285 | 25 | 0 | 1 | 1 | 4,335 | | | | | |
| 10 | Information and communication | 140 | 27,862 | 81 | 0 | 7 | (1) | 27,921 | | | | | |
| 10a | Financial and insurance activities | 1,370 | 352,811 | 325 | 0 | 84 | (20) | 353,856 | | | | | |
| 11 | Real estate activities | 833 | 41,141 | 141 | 0 | 29 | (41) | 41,833 | | | | | |
| 12 | Professional, scientific and technical activities | 393 | 16,453 | 96 | 0 | 8 | (6) | 16,750 | | | | | |
| 13 | Administrative and support service activities | 129 | 12,329 | 34 | 0 | 10 | (2) | 12,424 | | | | | |
| 14 | Public administration and defense, compulsory social security | 119 | 45,227 | 21 | 0 | 0 | 3 | 45,325 | | | | | |
| 15 | Education | 8 | 585 | 8 | 0 | 4 | 3 | 586 | | | | | |
| 16 | Human health services and social work activities | 37 | 6,145 | 19 | 0 | 1 | 6 | 6,162 | | | | | |
| 17 | Arts, entertainment and recreation | 51 | 2,593 | 15 | 0 | 1 | 1 | 2,629 | | | | | |
| 18 | Other service activities | 136 | 13,623 | 46 | 0 | 7 | 1 | 13,713 | | | | | |
| 18a | Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use | 3,911 | 219,491 | 2,142 | 0 | 432 | 269 | 221,260 | | | | | |
| 18b | Activities of extraterritorial organizations and bodies | 0 | 863 | 0 | 0 | 0 | 0 | 863 | | | | | |
| 19 | Total | 11,843 | 916,023 | 4,816 | 0 | 968 | 301 | 923,051 | | | | | |

¹ Credit risk adjustment charges of the period do not include recoveries.

Article 442 (h) CRR - Defaulted exposures by geographical area, past due, non-performing and forborne exposures

Table EU CR1-C provides asset quality information of the Group's on- and off-balance sheet exposures subject to the credit risk framework broken down by significant geographical regions as well as countries.

We consider a country as being significant, if it contributes to an aggregate of 90 % of our total exposure. An area is considered significant if it contains at least one significant country. The geographical distribution is based on the legal domicile of the counterparty or issuer.

The amounts shown below are based on IFRS accounting values according to the regulatory scope of consolidation. An exposure is being classified as defaulted if the default criteria according to Article 178 CRR are met. As confirmed by EBA (EBA/OP/2017/02) specific credit risk adjustments consist of all types of allowance for credit losses held against financial instruments subject to impairment according to IFRS 9 for the current fiscal year (IAS 39 for the prior fiscal year). The Group does not record any credit risk adjustment which qualify as general credit risk adjustment. The credit risk adjustment charges of the period are provided for a six month period in column "f".

EU CR1-C – Credit quality of exposures by geography

| | | Dec 31, 2018 | | | | | | |
|---------|--------------------------|--------------------------|-------------------------|---------------------------------|--------------------------------|------------------------|---|----------------------|
| | | a | b | c | d | e | f | g |
| | | Gross carrying values of | | | | | | |
| in € m. | | Defaulted exposures | Non-defaulted exposures | Specific credit risk adjustment | General credit risk adjustment | Accumulated write-offs | Credit risk adjustment charges of the period six months ended Dec 31, 2018 ¹ | Net values (a+b-c-d) |
| 1 | Europe | 8,661 | 578,036 | 3,972 | 0 | 1,222 | 199 | 582,725 |
| | Of which: | | | | | | | |
| 2 | Germany | 3,578 | 391,557 | 1,906 | 0 | 376 | 97 | 393,228 |
| 3 | United Kingdom | 393 | 23,033 | 46 | 0 | 18 | 4 | 23,380 |
| 4 | France | 13 | 11,576 | 13 | 0 | 3 | 2 | 11,576 |
| 5 | Luxembourg | 25 | 20,934 | 17 | 0 | 0 | 8 | 20,942 |
| 6 | Italy | 1,612 | 30,155 | 1,126 | 0 | 291 | 23 | 30,640 |
| 7 | Netherlands | 509 | 20,041 | 261 | 0 | 30 | 14 | 20,289 |
| 8 | Spain | 1,146 | 23,120 | 397 | 0 | 351 | 41 | 23,869 |
| 9 | Ireland | 552 | 6,063 | 28 | 0 | 1 | 13 | 6,587 |
| 10 | Switzerland | 326 | 17,934 | 25 | 0 | 0 | 0 | 18,235 |
| 11 | Poland | 64 | 6,188 | 41 | 0 | 31 | (22) | 6,212 |
| 12 | Belgium | 7 | 5,014 | 3 | 0 | 2 | (2) | 5,018 |
| 13 | Other Europe | 437 | 22,420 | 108 | 0 | 119 | 21 | 22,748 |
| 14 | North America | 633 | 243,035 | 240 | 0 | 119 | 105 | 243,428 |
| | Of which: | | | | | | | |
| 15 | U.S. | 251 | 227,332 | 199 | 0 | 95 | 93 | 227,383 |
| 16 | Cayman Islands | 137 | 3,062 | 8 | 0 | 0 | 3 | 3,191 |
| 17 | Canada | 27 | 3,677 | 7 | 0 | 0 | 5 | 3,697 |
| 18 | Other North America | 218 | 8,964 | 25 | 0 | 24 | 4 | 9,157 |
| 19 | Asia/Pacific | 604 | 74,191 | 266 | 0 | 22 | 36 | 74,529 |
| | Of which: | | | | | | | |
| 20 | Japan | 100 | 7,225 | (3) | 0 | (11) | 1 | 7,328 |
| 21 | Australia | 30 | 3,957 | 8 | 0 | 0 | 2 | 3,979 |
| 22 | India | 319 | 14,107 | 135 | 0 | 9 | 8 | 14,291 |
| 23 | China | 23 | 8,333 | 27 | 0 | 0 | 2 | 8,329 |
| 24 | Singapore | 41 | 10,282 | 10 | 0 | 0 | 5 | 10,312 |
| 25 | Hong Kong | 7 | 6,633 | 5 | 0 | 0 | 2 | 6,635 |
| 26 | Other Asia/Pacific | 85 | 23,654 | 84 | 0 | 23 | 15 | 23,655 |
| 27 | Other geographical areas | 241 | 15,042 | 86 | 0 | 54 | 28 | 15,197 |
| 28 | Total | 10,139 | 910,304 | 4,564 | 0 | 1,416 | 368 | 915,879 |

¹ Credit risk adjustment charges of the period do not include recoveries.

| | | Jun 30, 2018 | | | | | | |
|---------|--------------------------|--------------------------|-------------------------|---------------------------------|--------------------------------|------------------------|---|----------------------|
| | | a | b | c | d | e | f | g |
| | | Gross carrying values of | | | | | | |
| in € m. | | Defaulted exposures | Non-defaulted exposures | Specific credit risk adjustment | General credit risk adjustment | Accumulated write-offs | Credit risk adjustment charges of the period six months ended Jun 30, 2018 ¹ | Net values (a+b-c-d) |
| 1 | Europe | 9,480 | 579,012 | 4,251 | 0 | 734 | 321 | 584,241 |
| | Of which: | | | | | | | |
| 2 | Germany | 3,634 | 388,830 | 1,938 | 0 | 339 | 205 | 390,527 |
| 3 | United Kingdom | 473 | 25,581 | 43 | 0 | 13 | 4 | 26,010 |
| 4 | France | 17 | 11,927 | 14 | 0 | 0 | 1 | 11,931 |
| 5 | Luxembourg | 38 | 19,927 | 22 | 0 | 0 | (5) | 19,943 |
| 6 | Italy | 2,152 | 29,454 | 1,188 | 0 | 36 | 66 | 30,418 |
| 7 | Netherlands | 679 | 18,567 | 264 | 0 | 26 | 1 | 18,982 |
| 8 | Spain | 814 | 23,160 | 391 | 0 | 250 | 30 | 23,582 |
| 9 | Ireland | 412 | 7,061 | 20 | 0 | (7) | (3) | 7,452 |
| 10 | Switzerland | 422 | 16,748 | 31 | 0 | 0 | 2 | 17,139 |
| 11 | Poland | 265 | 10,766 | 145 | 0 | 6 | 19 | 10,886 |
| 12 | Belgium | 7 | 5,654 | 4 | 0 | 5 | 1 | 5,658 |
| 13 | Other Europe | 567 | 21,336 | 191 | 0 | 66 | (1) | 21,712 |
| 14 | North America | 1,217 | 251,597 | 236 | 0 | 158 | (30) | 252,578 |
| | Of which: | | | | | | | |
| 15 | U.S. | 887 | 236,160 | 177 | 0 | 124 | (30) | 236,870 |
| 16 | Cayman Islands | 125 | 2,957 | 3 | 0 | 15 | 1 | 3,078 |
| 17 | Canada | 32 | 3,780 | 15 | 0 | 0 | (3) | 3,797 |
| 18 | Other North America | 173 | 8,700 | 40 | 0 | 19 | 2 | 8,833 |
| 19 | Asia/Pacific | 852 | 69,379 | 278 | 0 | 44 | 4 | 69,954 |
| | Of which: | | | | | | | |
| 20 | Japan | 91 | 6,689 | 2 | 0 | (10) | (6) | 6,778 |
| 21 | Australia | 35 | 4,382 | 8 | 0 | 0 | (2) | 4,410 |
| 22 | India | 424 | 12,207 | 167 | 0 | 4 | 16 | 12,464 |
| 23 | China | 23 | 8,346 | 25 | 0 | 0 | 0 | 8,344 |
| 24 | Singapore | 149 | 8,977 | 9 | 0 | 0 | (4) | 9,117 |
| 25 | Hong Kong | 37 | 6,796 | 2 | 0 | 0 | 0 | 6,832 |
| 26 | Other Asia/Pacific | 93 | 21,983 | 66 | 0 | 49 | (1) | 22,010 |
| 27 | Other geographical areas | 294 | 16,035 | 51 | 0 | 33 | 6 | 16,278 |
| 28 | Total | 11,843 | 916,023 | 4,816 | 0 | 968 | 301 | 923,051 |

¹ Credit risk adjustment charges of the period do not include recoveries.

Table EU CR1-D provides a breakdown of the Group's loans and debt securities, where contractually agreed payments of principal or interest remain unpaid by the borrower by ageing of the overdue amounts irrespective of the impairment status of the borrower. The amounts shown are based on IFRS accounting values gross of credit risk adjustments according to the regulatory scope of consolidation.

EU CR1-D – Ageing of past-due exposures

| in € m. | Dec 31, 2018 | | | Jun 30, 2018 | | |
|------------------------|--------------|-----------------|-----------------|--------------|-----------------|-----------------|
| | 1 | 2 | 3 | 1 | 2 | 3 |
| | Loans | Debt Securities | Total exposures | Loans | Debt Securities | Total exposures |
| a ≤ 30 days | 2,235 | 0 | 2,235 | 3,503 | 0 | 3,503 |
| b > 30 days ≤ 60 days | 437 | 0 | 437 | 602 | 0 | 602 |
| c > 60 days ≤ 90 days | 289 | 0 | 289 | 343 | 0 | 343 |
| d > 90 days ≤ 180 days | 817 | 0 | 817 | 833 | 0 | 833 |
| e > 180 days ≤ 1 year | 650 | 0 | 650 | 675 | 0 | 676 |
| f > 1 year | 2,383 | 0 | 2,383 | 2,584 | 0 | 2,584 |

Table EU CR1-E provides details of the Group's non-performing and forborne exposures as per EBA definitions (Implementing Technical Standards (ITS) on Supervisory reporting on forbearance and non-performing exposures under article 99(4) of Regulation (EU) No 575/2013) as well as of the impairments booked against and collaterals/guarantees received for these exposures. Amounts in the table below reflect accounting values according to the regulatory scope of consolidation and include all debt instruments other than held for trading as per our IFRS balance sheet as well as off balance sheet exposures. For further information on the Group's treatment of forbearances, please refer to the "Asset quality" section of our Annual Report 2018 on page 123.

EU CR1-E – Non-performing and forborne exposures

| in € m. | Dec 31, 2018 | | | | | | Jun 30, 2018 | | | | | | | | | | | | | |
|---------|---|--------------------|-----------------------------|-----------------|--------------------|-----------------------------|-----------------|--------------------|-----------------------------|--------|---------|---------|--------|---------|---------|-------|-----|-----|--------|--------------------|
| | 010 | | 020 | | 030 | | 010 | | 030 | | | | | | | | | | | |
| | Debt securities | Loans and advances | Off-balance-sheet exposures | Debt securities | Loans and advances | Off-balance-sheet exposures | Debt securities | Loans and advances | Off-balance-sheet exposures | | | | | | | | | | | |
| a | Gross carrying amount of performing and non-performing exposures | | | | | | | | | 57,555 | 785,342 | 261,705 | 56,741 | 823,255 | 256,906 | | | | | |
| | of which: | | | | | | | | | | | | | | | | | | | |
| b | Performing but past due >30 days and <=90 days | | | | | | | | | | | | | | 0 | 529 | 0 | 0 | 662 | 0 |
| c | Performing forborne | | | | | | | | | | | | | | 0 | 1,794 | 184 | 0 | 1,860 | 138 |
| d | Non-performing: | | | | | | | | | 87 | 9,458 | 730 | 129 | 10,750 | 1,074 | | | | | |
| | of which: | | | | | | | | | | | | | | | | | | | |
| e | Defaulted | | | | | | | | | | | | | | 87 | 9,236 | 729 | 129 | 10,199 | 1,072 |
| f | Impaired | | | | | | | | | | | | | | 77 | 9,040 | 719 | 113 | 9,784 | 1,063 ¹ |
| g | Forborne | | | | | | | | | | | | | | 6 | 2,989 | 80 | 6 | 3,266 | 105 |
| | Accumulated impairment and provisions and negative fair value adjustments due to credit risk | | | | | | | | | | | | | | | | | | | |
| h | On performing exposures | | | | | | | | | | | | | | 10 | 1,023 | 200 | 13 | 930 | 177 |
| i | of which: Forborne | | | | | | | | | | | | | | 0 | 64 | 2 | 0 | 63 | 4 |
| j | On non-performing exposures | | | | | | | | | | | | | | 0 | 3,256 | 83 | 0 | 3,560 | 145 |
| k | of which: Forborne | | | | | | | | | | | | | | 0 | 963 | 3 | 0 | 1,176 | 3 |
| | Collaterals and financial guarantees received | | | | | | | | | | | | | | | | | | | |
| l | On non-performing exposures | | | | | | | | | | | | | | 0 | 3,059 | 50 | 0 | 3,857 | 53 |
| m | of which: Forborne exposures | | | | | | | | | | | | | | 0 | 2,000 | 65 | 0 | 2,162 | 21 |

¹ Non-performing "of which Impaired" for the June 30, 2018 period has been restated.

We further provide Templates 1, 3 and 4 of the EBA Guidelines on disclosure of non-performing and forborne exposures (EBA/GL/2018/10) published on December 17, 2018. These disclosures are meant to also address key disclosure recommendations related to non-performing loans ("NPLs") as provided by an ECB Guidance on NPLs (Appendix 7) issued in March 2017.

NPL1 – Credit quality of forborne exposures

| in € m. | Dec 31, 2018 | | | | | | |
|------------------------------|---|-------------------------|---|--|--|--------------------------------------|---|
| | Gross carrying amount of forborne exposures | | | | 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 | Non-performing forborne, of which defaulted | Non-performing forborne, of which impaired | on performing forborne exposures | on non-performing forborne exposures | |
| Loans and advances | 1,794 | 2,989 | 2,885 | 2,878 | 64 | 963 | 2,000 |
| Central banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| General governments | 0 | 5 | 5 | 5 | 0 | 3 | 0 |
| Credit institutions | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other financial corporations | 17 | 57 | 56 | 56 | 0 | 12 | 20 |
| Non-financial corporations | 813 | 1,858 | 1,836 | 1,829 | 25 | 632 | 1,160 |
| Households | 961 | 1,068 | 988 | 988 | 39 | 316 | 820 |
| Debt securities | 0 | 6 | 6 | 0 | 0 | 0 | 0 |
| Loan commitments given | 184 | 80 | 80 | 0 | 2 | 3 | 65 |
| Total | 1,978 | 3,075 | 2,971 | 2,878 | 66 | 966 | 2,065 |

NPL4 - Performing and non-performing exposures and related provisions

Dec 31, 2018

| in € m. | Gross carrying amount/nominal amount | | | | Accumulated impairment, accumulated negative changes in fair value due to credit risk and provisions | | | | | Collaterals and financial guarantees received on non-performing exposures |
|--|--------------------------------------|--------------------------|-------------------|--|---|--------------|-------------------------------|-------------------|-------------------|---|
| | 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 | | Accumulated partial write-off | | | |
| | | Total | of which: stage 2 | | of which: stage 3 | Total | | of which: stage 2 | of which: stage 3 | |
| Loans and advances | | | | | | | | | | |
| Central banks | 188,441 | 19 | 0 | 19 | 5 | 0 | 0 | 0 | 0 | 0 |
| General governments | 16,954 | 84 | 3 | 80 | 11 | 5 | 0 | 5 | 0 | 56 |
| Credit institutions | 50,999 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 |
| Other financial corporations | 169,514 | 973 | 159 | 813 | 58 | 79 | 0 | 79 | 4 | 49 |
| Non-financial corporations | 161,648 | 4,497 | 158 | 4,339 | 324 | 1,690 | 1 | 1,689 | 122 | 1,430 |
| of which: SMEs | 20,130 | 1,241 | 12 | 1,229 | 56 | 647 | 0 | 0 | 0 | 486 |
| Households | 188,328 | 3,885 | 98 | 3,788 | 606 | 1,482 | 5 | 1,477 | 19 | 1,750 |
| Total Loans and advances | 775,884 | 9,458 | 418 | 9,040 | 1,023 | 3,256 | 6 | 3,250 | 144 | 3,284 |
| Debt securities | | | | | | | | | | |
| Central banks | 1,443 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| General governments | 35,540 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Credit institutions | 11,794 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Other financial corporations | 3,529 | 28 | 0 | 28 | 2 | 0 | 0 | 0 | 0 | 0 |
| Non-financial corporations | 5,162 | 59 | 10 | 49 | 2 | 0 | 0 | 0 | 0 | 0 |
| Total Debt securities | 57,468 | 87 | 10 | 77 | 10 | 0 | 0 | 0 | 0 | 0 |
| Off balance sheet exposures | | | | | | | | | | |
| Central banks | 98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| General governments | 1,318 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Credit institutions | 6,732 | 4 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 |
| Other financial corporations | 47,111 | 232 | 0 | 232 | 21 | 0 | 0 | 0 | 0 | 1 |
| Non-financial corporations | 175,516 | 461 | 10 | 451 | 162 | 80 | 0 | 80 | 0 | 53 |
| Households | 30,201 | 33 | 1 | 32 | 12 | 3 | 0 | 3 | 0 | 2 |
| Total Off balance sheet exposures | 260,975 | 730 | 11 | 719 | 200 | 83 | 0 | 83 | 0 | 55 |
| Total | 1,094,327 | 10,275 | 1,158 | 9,117 | 1,232 | 3,339 | 6 | 3,333 | 144 | 3,340 |

NPL3 - Credit quality of performing and non-performing exposures by past due days

Dec 31, 2018

| in € m. | Performing exposures | | | Non-performing exposure | | | | | | | |
|--|----------------------|-------------------------------------|-------------------------|-------------------------|--|--------------------------|--------------------------|--------------------------|-------------------|--------------------|-------------------|
| | Total | Not past due or past due <= 30 days | Past due >30d and <=90d | Total | Unlikely to pay that are not past due or past due <= 90d | Past due >90d and <=180d | Past due >180d and <=1yr | Past due >1yr and <=5yrs | Past due >5 years | of which defaulted | of which impaired |
| Loans and advances | | | | | | | | | | | |
| Central banks | 188,441 | 188,441 | 0 | 19 | 19 | 0 | 0 | 0 | 0 | 19 | 19 |
| General governments | 16,954 | 16,954 | 0 | 84 | 82 | 0 | 0 | 0 | 1 | 84 | 80 |
| Credit institutions | 50,999 | 50,999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other financial corporations | 169,514 | 169,491 | 24 | 973 | 830 | 39 | 50 | 50 | 3 | 946 | 813 |
| Non-financial corporations | 161,648 | 161,542 | 106 | 4,497 | 2,884 | 456 | 172 | 593 | 392 | 4,394 | 4,339 |
| Households | 188,328 | 187,929 | 399 | 3,885 | 1,742 | 316 | 426 | 1,050 | 352 | 3,793 | 3,788 |
| Total Loans and advances | 775,884 | 775,356 | 529 | 9,458 | 5,558 | 811 | 648 | 1,693 | 748 | 9,236 | 9,040 |
| Debt securities | | | | | | | | | | | |
| Central banks | 1,443 | 1,443 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| General governments | 35,540 | 35,540 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Credit institutions | 11,794 | 11,794 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other financial corporations | 3,529 | 3,529 | 0 | 28 | 28 | 0 | 0 | 0 | 0 | 28 | 28 |
| Non-financial corporations | 5,162 | 5,162 | 0 | 59 | 59 | 0 | 0 | 0 | 0 | 59 | 49 |
| Total Debt securities | 57,468 | 57,468 | 0 | 87 | 87 | 0 | 0 | 0 | 0 | 87 | 77 |
| Off-balance sheet exposures | | | | | | | | | | | |
| Central banks | 98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| General governments | 1,318 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Credit institutions | 6,732 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Other financial corporations | 47,111 | 0 | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 232 | 232 |
| Non-financial corporations | 175,516 | 0 | 0 | 461 | 0 | 0 | 0 | 0 | 0 | 461 | 451 |
| Households | 30,201 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 32 | 32 |
| Total Off-balance sheet exposures | 260,975 | 0 | 0 | 730 | 0 | 0 | 0 | 0 | 0 | 729 | 719 |
| Total | 1,094,327 | 832,823 | 529 | 10,275 | 5,645 | 811 | 648 | 1,693 | 748 | 10,052 | 9,836 |

Article 442 (i) CRR - Development of credit risk adjustments and defaulted loans and debt securities

Table EU CR2-A provides information on the development of the Group's stock of specific credit risk adjustments held against loans and debt securities subject to the credit risk framework that are defaulted or impaired in the first and second half of 2018. Amounts are based on IFRS accounting values according to the regulatory scope of consolidation.

EU CR2-A – Changes in the stock of general and specific credit risk adjustments

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | |
|---|---|--|---|--|
| | a | b | a | b |
| | Accumulated specific credit risk adjustment | Accumulated general credit risk adjustment | Accumulated specific credit risk adjustment | Accumulated general credit risk adjustment |
| 1 Opening balance | 3,503 | 0 | 3,599 | 0 |
| 2 Increases due to amounts set aside for estimated loan losses during the period | 668 | 0 | 913 | 0 |
| 3 Decreases due to amounts reversed for estimated loan losses during the period | (315) | 0 | (669) | 0 |
| 4 Decreases due to amounts taken against accumulated credit risk adjustments | (598) | 0 | (346) | 0 |
| 5 Transfers between credit risk adjustments | (73) | 0 | 11 | 0 |
| 6 Impact of exchange rate differences | 15 | 0 | 11 | 0 |
| 7 Business combinations, including acquisitions and disposals of subsidiaries | 0 | 0 | 0 | 0 |
| 8 Other adjustments | 51 | 0 | (17) | 0 |
| 9 Closing balance | 3,250 | 0 | 3,503 | 0 |
| 10 Recoveries on credit risk adjustments recorded directly to the statement of profit or loss | (62) | 0 | (110) | 0 |
| 11 Specific credit risk adjustments recorded directly to the statement of profit or loss | 0 | 0 | 0 | 0 |

Accumulated specific credit risk adjustments held against defaulted or impaired loans and debt securities decreased by € 254 million or 7 % driven by CIB, where charge-offs among others related to de-risking activities in our shipping portfolio overcompensated additional provisions.

Table EU CR2-B provides information on the development of the Group's defaulted or impaired loans and debt securities subject to the credit risk framework for the second half of 2018 compared to the first half of 2018. Amounts are based on IFRS accounting values according to the regulatory scope of consolidation.

EU CR2-B – Changes in the stock of defaulted and impaired loans and debt securities

| in € m. | Dec 31, 2018 | Jun 30, 2018 |
|---|--|---|
| | a | a |
| | Gross carrying value defaulted exposures | Gross carrying value defaulted exposures ¹ |
| 1 Opening balance | 10,106 | 10,097 |
| 2 Loans and debt securities that have defaulted or impaired since the last reporting period | 1,613 | 2,379 |
| 3 Returned to non-defaulted status | (1,904) | (2,047) |
| 4 Amounts written off | (598) | (362) |
| 5 Other changes | 23 | 38 |
| 6 Closing balance | 9,240 | 10,106 |

¹ Gross carrying amounts for "Returned to non-defaulted status" as well as "Amounts written-off" have been restated for June 30, 2018 following a refinement of internal processes.

Defaulted or impaired loans and debt securities subject to the credit risk framework decreased by € 972 million or 10 % driven by the non-strategic business in CIB among others relating to de-risking activities in our shipping portfolio.

For IFRS-based asset quality information please refer to the section "Asset quality" in our Annual Report 2018 on page 123.

General qualitative information on credit risk mitigation

Introduction

Risk-weighted assets and regulatory capital requirements can be managed actively by credit risk mitigation techniques. As a prerequisite for recognition in regulatory calculations, we must adhere to certain minimum requirements as stipulated in the CRR regarding collateral management, monitoring processes and legal enforceability.

The range of collateral being eligible for regulatory recognition is dependent predominantly on the regulatory capital calculation method used for a specific risk position. The principle is that a higher degree of sophistication with regard to the underlying methodology generally leads to a wider range of admissible collateral and options to recognize protection via guarantees and credit derivatives. However, also the minimum requirements to be adhered to and the mechanism available to reflect the risk mitigation benefits are predominantly a function of the regulatory calculation method applied.

The advanced IRBA generally accepts all types of financial collateral, as well as real estate, collateral assignments and other physical collateral. In our application of the advanced IRBA, there is basically no limitation to the range of accepted collateral as long as we can demonstrate to the competent authorities that reliable estimates of the collateral values can be generated and that basic requirements are fulfilled.

The same principle holds true for taking benefits from guarantee and credit derivative arrangements. Within the advanced IRBA, again there are generally no limitations with regard to the range of eligible collateral providers as long as some basic minimum requirements are met. However, collateral providers' credit quality and other relevant factors are incorporated through our internal models.

In our advanced IRBA calculations financial and other collateral is generally considered through an adjustment to the applicable LGD as the input parameter for determining the risk weight. For recognizing protection from guarantees and credit derivatives, generally a PD substitution approach is applied, i.e., within the advanced IRBA risk-weight calculation the PD of the borrower is replaced by the protection seller's or guarantor's PD. However, for certain guaranteed exposures and certain protection providers the so-called double default treatment is applicable. The double default effect implies that for a guaranteed exposure a loss only occurs if the originator and the guarantor fail to meet their obligations at the same time.

The foundation IRBA sets stricter limitations with regard to the eligibility of credit risk mitigation compared to the advanced IRBA but allows for consideration of financial collateral, guarantees and credit derivatives as well as other foundation IRBA-eligible collateral like mortgages and security assignments.

The financial collateral recognized in the foundation IRBA essentially comprises cash, bonds and other securities related to repo lending.

In the standardized approach, collateral recognition is limited to eligible financial collateral, such as cash, gold bullion, certain debt securities, equities and CIUs, in many cases only with their volatility-adjusted collateral value. In its general structure, the standardized approach provides a preferred (lower) risk-weight for "claims secured by real estate property" while real estate asset is not considered as an explicit collateral item under the standardized approach. Further limitations must be considered with regard to eligible guarantee and credit derivative providers.

In order to reflect risk mitigation techniques in the calculation of capital requirements we apply the financial collateral comprehensive method since the higher sophistication of that method allows a broader range of eligible collateral. Within this approach, financial collateral is reflected through a reduction in the exposure value of the respective risk position, while protection taken in the form of guarantees and credit derivatives is considered by means of a substitution, i.e., the borrower's risk weight is replaced by the risk weight of the protection provider.

Article 453 (a) CRR - Use of on- and off-balance sheet netting

Please refer to the Annual Report 2018 section "Managing and mitigation of credit risk" on page 66.

Article 453 (b) CRR - Collateral valuation and management

Please refer to the Annual Report 2018 section "Managing and mitigation of credit risk" on page 66.

Article 453 (c) CRR - Main types of collateral

Please refer to the Annual Report 2018 section "Managing and mitigation of credit risk" on page 66.

Article 453 (d) CRR - Main types of guarantor and credit derivative counterparties

Please refer to the Annual Report 2018 section "Managing and mitigation of credit risk" on page 66.

Article 453 (e) CRR - Risk concentrations within credit risk mitigation

Please refer to the Annual Report 2018 section "Managing and mitigation of credit risk" subsection "Concentrations within credit risk mitigation" on page 70.

General quantitative information on credit risk mitigation

Article 453 (f-g) CRR - Overview of credit risk mitigation techniques

The table EU CR3 below shows a breakdown of unsecured and secured credit risk exposures and credit risk exposures secured by various credit risk mitigants for all loans and debt securities including the carrying amounts of the total population which are in default. Exposures unsecured (column a) represent the carrying amount of credit risk exposures (net of credit risk adjustments) that do not benefit from a credit risk mitigation (CRM) technique, regardless of whether this technique is recognized in the CRR. Exposures secured (column b) represent the carrying amount of exposures that have at least one CRM mechanism (collateral, financial guarantees, credit derivatives) associated with them. Exposure secured by various credit risk mitigants (column c-e) are the carrying amount of exposures (net of credit risk adjustments) partly or totally secured by collateral, financial guarantees and credit derivatives, whereby only the secured portion of the overall exposure is presented. The allocation of the carrying amount of multisecured exposures to their different CRM mechanisms is made by order of priority, starting with the CRM mechanism expected to be called first in the event of a loss, and within the limits of the carrying amount of the secured exposures. Moreover, no overcollateralization is considered.

EU CR3 – CRM techniques – Overview

| | | Dec 31, 2018 | | | | |
|----------|------------------------|--------------------------------------|------------------------------------|---------------------------------|---|---|
| | | a | b | c | d | e |
| in € m. | | Exposures unsecured: Carrying amount | Exposures secured: Carrying amount | Exposures secured by collateral | Exposures secured by financial guarantees | Exposures secured by credit derivatives |
| 1 | Total Loans | 122,182 | 272,589 | 230,734 | 15,911 | 787 |
| 2 | Total Debt securities | 56,981 | 465 | 49 | 416 | 0 |
| 3 | Total exposures | 179,164 | 273,054 | 230,783 | 16,328 | 787 |
| 4 | of which: defaulted | 2,439 | 3,549 | 2,891 | 220 | 0 |

| | | Jun 30, 2018 | | | | |
|----------|------------------------|--------------------------------------|------------------------------------|---------------------------------|---|---|
| | | a | b | c | d | e |
| in € m. | | Exposures unsecured: Carrying amount | Exposures secured: Carrying amount | Exposures secured by collateral | Exposures secured by financial guarantees | Exposures secured by credit derivatives |
| 1 | Total Loans | 112,549 | 273,335 | 227,784 | 18,093 | 932 |
| 2 | Total Debt securities | 56,805 | 417 | 0 | 417 | 0 |
| 3 | Total exposures | 169,354 | 273,752 | 227,784 | 18,510 | 932 |
| 4 | of which: defaulted | 2,286 | 4,317 | 3,497 | 411 | 0 |

The table CRM techniques by exposure class below shows a breakdown of unsecured and secured credit risk exposures and credit risk exposures secured by various credit risk mitigants broken down by exposure class. Exposures unsecured (column a) represent the carrying amount of credit risk exposures (net of credit risk adjustments) that do not benefit from a credit risk mitigation (CRM) technique, regardless of whether this technique is recognized in the CRR. Exposures secured (column b) represent the carrying amount of exposures that have at least one CRM mechanism (collateral, financial guarantees, credit derivatives) associated with them. Exposure secured by various credit risk mitigants (column c-e) are the carrying amount of exposures (net of credit risk adjustments) partly or totally secured by collateral, financial guarantees and credit derivatives, whereby only the secured portion of the overall exposure is presented. The breakdown into the exposure classes follows those as defined for the IRBA (i.e combining the advanced and foundation IRB) as well as the standardized approach. In the IRB

approach, the line item "Central governments and central banks" includes exposures to regional governments or local authorities, public sector entities, multilateral development banks and international organizations. The exposure class "Other items" within the standardized approach includes all exposures not covered in the other categories.

The table CRM techniques by exposure class shows a breakdown of unsecured and secured credit risk exposures and credit risk exposures secured by various credit risk mitigants broken down by exposure class whereas table EU CR3 shows a breakdown of unsecured and secured credit risk exposures and credit risk exposures secured by various credit risk mitigants for all loans and debt securities including the carrying amounts of the total population which are in default.

CRM techniques by exposure class

| in € m. | Dec 31, 2018 | | | | |
|---|--------------------------------------|------------------------------------|---------------------------------|---|---|
| | a | b | c | d | e |
| | Exposures unsecured: Carrying amount | Exposures secured: Carrying amount | Exposures secured by collateral | Exposures secured by financial guarantees | Exposures secured by credit derivatives |
| Advanced IRBA | | | | | |
| Central governments and central banks | 115,921 | 2,506 | 37 | 2,124 | 0 |
| Institutions | 21,347 | 4,220 | 3,363 | 346 | 47 |
| Corporates | 240,552 | 133,644 | 82,853 | 18,154 | 5,120 |
| of which: | | | | | |
| SMEs | 8,481 | 8,157 | 4,420 | 1,695 | 0 |
| Specialized lending | 6,044 | 27,262 | 23,171 | 761 | 0 |
| Other | 226,027 | 98,225 | 55,261 | 15,698 | 5,120 |
| Retail | 52,817 | 165,246 | 140,560 | 1,929 | 0 |
| of which: | | | | | |
| Secured by real estate property SMEs | 987 | 8,446 | 6,866 | 184 | 0 |
| Secured by real estate property non-SMEs | 7,194 | 149,103 | 128,959 | 320 | 0 |
| Qualifying revolving | 16,414 | 52 | 26 | 1 | 0 |
| Other retail SMEs | 3,550 | 2,148 | 483 | 1,165 | 0 |
| Other retail non-SMEs | 24,673 | 5,496 | 4,225 | 260 | 0 |
| Equity | 2,137 | 0 | 0 | 0 | 0 |
| Other non-credit obligation asset | 6,893 | 0 | 0 | 0 | 0 |
| Total advanced IRBA | 439,668 | 305,617 | 226,813 | 22,553 | 5,167 |
| Foundation IRBA | | | | | |
| Central governments and central banks | 17 | 0 | 0 | 0 | 0 |
| Institutions | 639 | 0 | 0 | 0 | 0 |
| Corporates | 4,867 | 2,314 | 1,212 | 665 | 0 |
| of which: | | | | | |
| SMEs | 23 | 0 | 0 | 0 | 0 |
| Specialized lending | 22 | 1,470 | 1,189 | 0 | 0 |
| Other | 4,822 | 844 | 23 | 665 | 0 |
| Total foundation IRBA | 5,523 | 2,314 | 1,212 | 665 | 0 |
| Standardized Approach | | | | | |
| Central governments or central banks | 112,422 | 2 | 1 | 1 | 0 |
| Regional governments or local authorities | 10,050 | 35 | 13 | 15 | 0 |
| Public sector entities | 5,336 | 0 | 0 | 0 | 0 |
| Multilateral development banks | 3,344 | 0 | 0 | 0 | 0 |
| International organizations | 1,496 | 0 | 0 | 0 | 0 |
| Institutions | 1,394 | 18 | 11 | 7 | 0 |
| Corporates | 14,552 | 4,947 | 4,288 | 156 | 0 |
| Retail | 3,126 | 1,155 | 963 | 82 | 0 |
| Secured by mortgages on immovable property | 160 | 4,321 | 3,959 | 55 | 0 |
| Exposures in default ¹ | 542 | 396 | 356 | 10 | 0 |
| Items associated with particularly high risk | 33 | 306 | 289 | 4 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 | 0 |
| Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 |
| Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 |
| Equity exposures | 50 | 0 | 0 | 0 | 0 |
| Other items | 12 | 0 | 0 | 0 | 0 |
| Total standardized approach | 151,973 | 10,784 | 9,524 | 321 | 0 |
| Total | 597,164 | 318,714 | 237,549 | 23,538 | 5,167 |

¹ In light of recent EBA guidance (Q&A 2017_3481) we have revised our approach to present the defaulted exposure within the standardized approach: We present the total of defaulted exposure but also show a breakdown of defaulted exposure and assign it to their respective exposure classes. In order to avoid double counting of exposures, the total exposure of the standardized approach as presented does not take into account figures disclosed. This new approach is applied for December 31, 2018, but not for the comparative numbers as of June 30, 2018.

| | Jun 30, 2018 | | | | |
|---|--------------------------------------|------------------------------------|---------------------------------|---|---|
| | a | b | c | d | e |
| in € m. | Exposures unsecured: Carrying amount | Exposures secured: Carrying amount | Exposures secured by collateral | Exposures secured by financial guarantees | Exposures secured by credit derivatives |
| Advanced IRBA | | | | | |
| Central governments and central banks | 115,649 | 3,079 | 75 | 2,488 | 0 |
| Institutions | 22,390 | 4,345 | 3,353 | 522 | 47 |
| Corporates | 237,080 | 128,863 | 80,184 | 19,627 | 5,446 |
| of which: | | | | | |
| SMEs | 8,806 | 9,318 | 5,138 | 1,667 | 0 |
| Specialized lending | 6,287 | 26,662 | 22,759 | 746 | 0 |
| Other | 221,987 | 92,883 | 52,287 | 17,215 | 5,446 |
| Retail | 57,900 | 161,745 | 142,130 | 1,814 | 0 |
| of which: | | | | | |
| Secured by real estate property SMEs | 907 | 8,964 | 7,303 | 186 | 0 |
| Secured by real estate property non-SMEs | 12,380 | 145,277 | 130,229 | 298 | 0 |
| Qualifying revolving | 16,624 | 56 | 29 | 1 | 0 |
| Other retail SMEs | 3,865 | 2,124 | 582 | 1,036 | 0 |
| Other retail non-SMEs | 24,124 | 5,324 | 3,987 | 294 | 0 |
| Equity | 1,666 | 0 | 0 | 0 | 0 |
| Other non-credit obligation asset | 6,468 | 0 | 0 | 0 | 0 |
| Total advanced IRBA | 441,154 | 298,031 | 225,742 | 24,451 | 5,494 |
| Foundation IRBA | | | | | |
| Central governments and central banks | 12 | 0 | 0 | 0 | 0 |
| Institutions | 1 | 0 | 0 | 0 | 0 |
| Corporates | 4,441 | 2,052 | 1,150 | 677 | 0 |
| of which: | | | | | |
| SMEs | 55 | 4 | 0 | 3 | 0 |
| Specialized lending | 263 | 1,133 | 1,089 | 0 | 0 |
| Other | 4,124 | 915 | 60 | 673 | 0 |
| Total foundation IRBA | 4,454 | 2,052 | 1,150 | 676 | 0 |
| Standardized Approach | | | | | |
| Central governments or central banks | 124,372 | 3 | 2 | 0 | 0 |
| Regional governments or local authorities | 10,464 | 31 | 10 | 0 | 0 |
| Public sector entities | 6,195 | 0 | 0 | 0 | 0 |
| Multilateral development banks | 3,931 | 0 | 0 | 0 | 0 |
| International organizations | 1,672 | 0 | 0 | 0 | 0 |
| Institutions | 1,490 | 179 | 170 | 7 | 0 |
| Corporates | 14,130 | 4,947 | 4,330 | 226 | 0 |
| Retail | 3,714 | 812 | 627 | 97 | 0 |
| Secured by mortgages on immovable property | 59 | 4,024 | 3,719 | 66 | 0 |
| Exposures in default | 627 | 310 | 279 | 11 | 0 |
| Items associated with particularly high risk | 49 | 152 | 133 | 4 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 | 0 |
| Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 |
| Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 |
| Equity exposures | 195 | 0 | 0 | 0 | 0 |
| Other items | 2 | 0 | 0 | 0 | 0 |
| Total standardized approach | 166,900 | 10,459 | 9,270 | 412 | 0 |
| Total | 612,509 | 310,542 | 236,161 | 25,539 | 5,494 |

Credit risk exposure in the standardized approach

Standardized approach

We treat a subset of our credit risk exposures within the standardized approach. The standardized approach measures credit risk either pursuant to fixed risk weights, which are regulatorily predefined or determined through the application of external ratings.

We assign certain credit exposures permanently to the standardized approach in accordance with Article 150 CRR. These are predominantly exposures to the Federal Republic of Germany and other German public sector entities as well as exposures to central governments of other European Member States that meet the required conditions. These exposures make up the majority of the exposures carried in the standardized approach and receive predominantly a risk weight of zero percent. For internal purposes, however, these exposures are subject to an internal credit assessment and fully integrated in the risk management and economic capital processes.

In line with Article 150 CRR and Section 10 SolvV, we assign further – generally IRBA eligible – exposures permanently to the standardized approach. This population comprises several small-sized portfolios, which are considered to be immaterial on a stand-alone basis for inclusion in the IRBA.

Other credit exposures which are small in size are temporarily assigned to the standardized approach and we plan to transfer them to the IRBA over time. The prioritization and the corresponding transition plan is discussed and agreed with the competent authorities, the Bundesbank, the BaFin and the ECB.

Article 444 (a-b) CRR - External ratings in the standardized approach

In order to calculate the regulatory capital requirements under the standardized approach, we use eligible external ratings from Standard & Poor's, Moody's, Fitch Ratings and in some cases from DBRS. Ratings are applied to all relevant exposure classes in the standardized approach. If more than one rating is available for a specific counterparty, the selection criteria as set out in Article 138 CRR are applied in order to determine the relevant risk weight for the capital calculation.

Article 444 (c) CRR - Usage of issue ratings

Given the low volume of exposures covered under the standardized approach and the high percentage of (externally rated) central government exposures therein, we principally do not consider impacts from inferring issue ratings from issuer ratings.

Article 444 (d) CRR - Mapping of external rating to credit quality steps

This information does not need to be disclosed separately as Deutsche Bank Group complies with the standard association published by EBA.

Please refer to section "Article 452 (b)(i) CRR – Mapping of internal rating scales to external ratings" in this Pillar 3 Report on page 81 for a mapping of internal ratings and probability of defaults.

Article 444 (e) CRR - Credit risk exposure and credit risk mitigation in the standardized approach

The table below shows our credit risk exposure before credit conversion factors and credit risk mitigation obtained in the form of eligible financial collateral, guarantees and credit derivatives and the exposure at default values (EaD) in the standardized

approach as well as related RWA and average risk weights broken down by regulatory exposure classes and a split in on- and off-balance sheet exposures.

EU CR4 – Standardized approach – credit risk exposure and credit risk mitigation (CRM) effects

| | | | | | | | Dec 31, 2018 | | | | | | |
|--------------------------------------|---|--|--|--|--|--|---------------------------------|--------------------------------|-------------------------------|--------------------------------|--------------------|---------------|---|
| | | | | | | | a | b | c | d | e | | f |
| in € m. (unless stated otherwise) | | | | | | | Exposures before CCF and CRM | | Exposures post-CCF and CRM | | RWA and average RW | | |
| Exposure classes | | | | | | | On-balance sheet amount | Off-balance sheet amount | On-balance sheet amount | Off-balance sheet amount | RWA | Average RW | |
| 1 | Central governments or central banks | | | | | | 113,545 | 15 | 113,584 | 11 | 2 | 0% | |
| 2 | Regional government or local authorities | | | | | | 9,816 | 336 | 9,812 | 52 | 14 | 0.14% | |
| 3 | Public sector entities | | | | | | 5,292 | 48 | 5,289 | 13 | 77 | 1.45% | |
| 4 | Multilateral development banks | | | | | | 3,348 | 0 | 3,347 | 0 | 0 | 0% | |
| 5 | International organizations | | | | | | 1,500 | 0 | 1,499 | 0 | 0 | 0% | |
| 6 | Institutions | | | | | | 1,129 | 303 | 1,129 | 152 | 58 | 4.53% | |
| 7 | Corporates | | | | | | 13,362 | 3,592 | 10,574 | 823 | 10,817 | 94.91% | |
| 8 | Retail | | | | | | 3,193 | 1,492 | 2,925 | 32 | 2,196 | 74.26% | |
| 9 | Secured by mortgages on immovable property | | | | | | 3,674 | 66 | 3,663 | 31 | 1,418 | 38.39% | |
| 10 | Exposures in default | | | | | | 1,183 | 11 | 837 | 3 | 1,154 | 137.38% | |
| 11 | Items associated with particularly high risk | | | | | | 275 | 26 | 137 | 1 | 208 | 150.72% | |
| 12 | Covered bonds | | | | | | 0 | 0 | 0 | 0 | 0 | N/M | |
| 13 | Claims on institutions and corporates with a short-term credit assessment | | | | | | 0 | 0 | 0 | 0 | 0 | N/M | |
| 14 | Collective investments undertakings (CIU) | | | | | | 0 | 0 | 0 | 0 | 0 | N/M | |
| 15 | Equity exposures | | | | | | 50 | 0 | 50 | 0 | 50 | 100.00% | |
| 16 | Other items | | | | | | 12 | 2,319 | 12 | 2,319 | 2,322 | 99.61% | |
| 17 | Total | | | | | | 156,379 | 8,209 | 152,859 | 3,437 | 18,315 | 11.72% | |

| | | | | | | | Jun 30, 2018 | | | | | | |
|--------------------------------------|---|--|--|--|--|--|---------------------------------|--------------------------------|-------------------------------|--------------------------------|--------------------|---------------|---|
| | | | | | | | a | b | c | d | e | | f |
| in € m. (unless stated otherwise) | | | | | | | Exposures before CCF and CRM | | Exposures post-CCF and CRM | | RWA and average RW | | |
| Exposure classes | | | | | | | On-balance sheet amount | Off-balance sheet amount | On-balance sheet amount | Off-balance sheet amount | RWA | Average RW | |
| 1 | Central governments or central banks | | | | | | 128,321 | 918 | 128,455 | 3 | 0 | 0% | |
| 2 | Regional government or local authorities | | | | | | 10,196 | 395 | 10,213 | 82 | 19 | 0.18% | |
| 3 | Public sector entities | | | | | | 6,379 | 19 | 6,378 | 8 | 87 | 1.36% | |
| 4 | Multilateral development banks | | | | | | 4,140 | 0 | 4,141 | 0 | 0 | 0% | |
| 5 | International organizations | | | | | | 1,673 | 0 | 1,672 | 0 | 0 | 0% | |
| 6 | Institutions | | | | | | 1,566 | 37 | 1,566 | 26 | 174 | 10.93% | |
| 7 | Corporates | | | | | | 13,095 | 4,164 | 10,273 | 1,009 | 11,235 | 99.58% | |
| 8 | Retail | | | | | | 3,668 | 1,558 | 3,473 | 63 | 2,627 | 74.29% | |
| 9 | Secured by mortgages on immovable property | | | | | | 3,430 | 68 | 3,429 | 31 | 1,296 | 37.46% | |
| 10 | Exposures in default | | | | | | 929 | 20 | 925 | 7 | 1,276 | 136.91% | |
| 11 | Items associated with particularly high risk | | | | | | 206 | 5 | 202 | 1 | 305 | 150.25% | |
| 12 | Covered bonds | | | | | | 0 | 0 | 0 | 0 | 0 | N/M | |
| 13 | Claims on institutions and corporates with a short-term credit assessment | | | | | | 0 | 0 | 0 | 0 | 0 | N/M | |
| 14 | Collective investments undertakings (CIU) | | | | | | 0 | 0 | 0 | 0 | 0 | N/M | |
| 15 | Equity exposures | | | | | | 195 | 0 | 195 | 0 | 195 | 100.00% | |
| 16 | Other items | | | | | | 29 | 1,878 | 29 | 1,878 | 1,906 | 99.95% | |
| 17 | Total | | | | | | 173,828 | 9,061 | 170,952 | 3,109 | 19,118 | 10.98% | |

In the following table the exposure at default values (EaD) per regulatory exposure class are assigned to their standardized risk weights. Deducted or unrated items are split out separately. The exposures are shown prior to the shift to the exposure class of the protection seller.

EU CR5 – Standardized approach

| in € m. | | | | | | | Dec 31, 2018 |
|------------------|---|----------------|----------|----------|----------|--------------|--------------|
| | | | | | | | Risk Weight |
| Exposure classes | | 0% | 2% | 4% | 10% | 20% | 35% |
| 1 | Central governments or central banks | 113,592 | 0 | 0 | 0 | 0 | 0 |
| 2 | Regional governments or local authorities | 9,820 | 0 | 0 | 0 | 27 | 0 |
| 3 | Public sector entities | 4,993 | 0 | 0 | 0 | 267 | 0 |
| 4 | Multilateral development banks | 3,347 | 0 | 0 | 0 | 0 | 0 |
| 5 | International organizations | 1,499 | 0 | 0 | 0 | 0 | 0 |
| 6 | Institutions | 946 | 0 | 0 | 0 | 193 | 0 |
| 7 | Corporates | 0 | 0 | 0 | 0 | 762 | 0 |
| 8 | Retail | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 0 | 2,772 |
| 10 | Exposures in default | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | Other items | 0 | 0 | 0 | 0 | 12 | 0 |
| 17 | Total | 134,198 | 0 | 0 | 0 | 1,262 | 2,772 |

| in € m. | | | | | | | Dec 31, 2018 |
|------------------|---|--------------|----------|--------------|---------------|------------|--------------|
| | | | | | | | Risk Weight |
| Exposure classes | | 50% | 70% | 75% | 100% | 150% | 250% |
| 1 | Central governments or central banks | 3 | 0 | 0 | 0 | 0 | 0 |
| 2 | Regional governments or local authorities | 17 | 0 | 0 | 0 | 0 | 0 |
| 3 | Public sector entities | 36 | 0 | 0 | 5 | 0 | 0 |
| 4 | Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Institutions | 53 | 0 | 0 | 4 | 0 | 0 |
| 7 | Corporates | 42 | 0 | 0 | 10,465 | 116 | 0 |
| 8 | Retail | 0 | 0 | 2,941 | 0 | 0 | 0 |
| 9 | Secured by mortgages on immovable property | 896 | 0 | 0 | 0 | 0 | 0 |
| 10 | Exposures in default | 0 | 0 | 0 | 212 | 628 | 0 |
| 11 | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 139 | 0 |
| 12 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | Equity exposures | 0 | 0 | 0 | 50 | 0 | 0 |
| 16 | Other items | 0 | 0 | 0 | 2,319 | 0 | 0 |
| 17 | Total | 1,047 | 0 | 2,941 | 13,056 | 882 | 0 |

| in € m. | | | | | | | Dec 31, 2018 |
|------------------|---|----------|----------|----------|----------|----------------|-------------------|
| | | | | | | | Risk Weight |
| Exposure classes | | 370% | 1250% | Others | Deducted | Total | Of which: unrated |
| 1 | Central governments or central banks | 0 | 0 | 0 | 0 | 113,595 | 113,595 |
| 2 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 9,865 | 9,847 |
| 3 | Public sector entities | 0 | 0 | 0 | 0 | 5,302 | 5,302 |
| 4 | Multilateral development banks | 0 | 0 | 0 | 0 | 3,347 | 3,347 |
| 5 | International organizations | 0 | 0 | 0 | 0 | 1,499 | 1,499 |
| 6 | Institutions | 0 | 0 | 0 | 0 | 1,196 | 1,161 |
| 7 | Corporates | 0 | 0 | 0 | 0 | 11,385 | 11,024 |
| 8 | Retail | 0 | 0 | 0 | 0 | 2,941 | 2,941 |
| 9 | Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 3,668 | 3,668 |
| 10 | Exposures in default | 0 | 0 | 0 | 0 | 840 | 840 |
| 11 | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 139 | 139 |
| 12 | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | Equity exposures | 0 | 0 | 0 | 0 | 50 | 50 |
| 16 | Other items | 0 | 0 | 0 | 0 | 2,331 | 2,331 |
| 17 | Total | 0 | 0 | 0 | 0 | 156,157 | 155,744 |

| in € m. | Jun 30, 2018 | | | | | |
|--|----------------|----------|----------|----------|------------|--------------|
| | Risk Weight | | | | | |
| Exposure classes | 0% | 2% | 4% | 10% | 20% | 35% |
| 1 Central governments or central banks | 128,458 | 0 | 0 | 0 | 0 | 0 |
| 2 Regional governments or local authorities | 10,209 | 0 | 0 | 0 | 85 | 0 |
| 3 Public sector entities | 6,010 | 0 | 0 | 0 | 338 | 0 |
| 4 Multilateral development banks | 4,141 | 0 | 0 | 0 | 0 | 0 |
| 5 International organizations | 1,672 | 0 | 0 | 0 | 0 | 0 |
| 6 Institutions | 1,060 | 0 | 0 | 0 | 418 | 0 |
| 7 Corporates | 0 | 0 | 0 | 0 | 30 | 0 |
| 8 Retail | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 0 | 2,788 |
| 10 Exposures in default | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 Items associated with particularly high risk | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 Other items | 0 | 0 | 0 | 0 | 2 | 0 |
| 17 Total | 151,549 | 0 | 0 | 0 | 872 | 2,788 |

| in € m. | Jun 30, 2018 | | | | | |
|--|--------------|----------|--------------|---------------|------------|----------|
| | Risk Weight | | | | | |
| Exposure classes | 50% | 70% | 75% | 100% | 150% | 250% |
| 1 Central governments or central banks | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 Regional governments or local authorities | 0 | 0 | 0 | 2 | 0 | 0 |
| 3 Public sector entities | 39 | 0 | 0 | 0 | 0 | 0 |
| 4 Multilateral development banks | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 International organizations | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 Institutions | 51 | 0 | 0 | 64 | 0 | 0 |
| 7 Corporates | 46 | 0 | 0 | 11,048 | 98 | 0 |
| 8 Retail | 0 | 0 | 3,536 | 0 | 0 | 0 |
| 9 Secured by mortgages on immovable property | 673 | 0 | 0 | 0 | 0 | 0 |
| 10 Exposures in default | 0 | 0 | 0 | 244 | 687 | 0 |
| 11 Items associated with particularly high risk | 0 | 0 | 0 | 0 | 203 | 0 |
| 12 Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 Equity exposures | 0 | 0 | 0 | 195 | 0 | 0 |
| 16 Other items | 0 | 0 | 0 | 1,905 | 0 | 0 |
| 17 Total | 807 | 0 | 3,536 | 13,459 | 989 | 0 |

| in € m. | Jun 30, 2018 | | | | | |
|--|--------------|----------|----------|----------|----------------|-------------------|
| | Risk Weight | | | | | Of which: unrated |
| Exposure classes | 370% | 1250% | Others | Deducted | Total | |
| 1 Central governments or central banks | 0 | 0 | 0 | 0 | 128,458 | 121,547 |
| 2 Regional governments or local authorities | 0 | 0 | 0 | 0 | 10,295 | 3,584 |
| 3 Public sector entities | 0 | 0 | 0 | 0 | 6,386 | 5,566 |
| 4 Multilateral development banks | 0 | 0 | 0 | 0 | 4,141 | 3,565 |
| 5 International organizations | 0 | 0 | 0 | 0 | 1,672 | 1,146 |
| 6 Institutions | 0 | 0 | 0 | 0 | 1,593 | 1,554 |
| 7 Corporates | 0 | 0 | 0 | 0 | 11,223 | 11,161 |
| 8 Retail | 0 | 0 | 0 | 0 | 3,537 | 3,537 |
| 9 Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 3,460 | 3,460 |
| 10 Exposures in default | 0 | 0 | 0 | 0 | 932 | 932 |
| 11 Items associated with particularly high risk | 0 | 0 | 0 | 0 | 203 | 203 |
| 12 Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 Equity exposures | 0 | 0 | 0 | 0 | 195 | 195 |
| 16 Other items | 0 | 0 | 0 | 0 | 1,907 | 1,885 |
| 17 Total | 0 | 0 | 0 | 0 | 174,002 | 158,335 |

Credit risk exposure and credit risk mitigation in the internal-rating-based approach

Qualitative information on the use of the IRB approach

Article 452 (a) CRR - Approval status for IRB approaches

For the majority of our credit portfolios, we are applying the advanced IRBA to calculate the regulatory capital requirements according to the CRR/CRD 4 framework, based on respective approvals received from BaFin and ECB. The regulatory approvals obtained as a result of the advanced IRBA audit processes for our regulatory credit exposures allow the usage of currently 63 internally developed rating systems for regulatory capital calculation purposes excluding for exposures in Postbank. Thereof, 37 rating systems were authorized in December 2007. Overall they cover all of our material exposures in the advanced IRBA eligible exposure classes "Central governments and central banks", "Institutions", "Corporates", and "Retail".

As an IRBA institution, we are required to treat specific equity positions and other non-credit obligation assets generally within the IRBA. For these exposure types typically regulatory defined IRBA risk weights are applied.

Our exposures reported under foundation IRBA include parts of Postbank's corporate portfolios, which receive regulatory risk weights using the so-called 'supervisory slotting criteria' approach. Further details of the Foundation Approach are provided in the section "Foundation Internal Ratings Based Approach".

At Group level, we assign a few remaining advanced IRBA eligible portfolios of small size temporarily to the standardized approach. Details of the standardized approach and the standardized approach exposures are discussed in the section "Credit risk exposure in the standardized approach" on page 77 within this report.

Our advanced IRBA coverage ratio, excluding Postbank, amounted to 96.4 % by exposure value ("EAD") and 90.5 % by RWA as of December 31, 2018, using applicable measures according to Section 11 SolvV. It decreased from the levels at December 31, 2017, which amounted to 96.8 % by EAD and 90.7 % by RWA. In this regard, our RWA-based coverage ratio has fallen slightly below 92 %, the regulatory minimum requirements with regard to the coverage ratio thresholds. ECB as our competent authority is informed about the coverage ratio development on a continual basis and required actions (if any) will be discussed jointly; also considering potential changes in regulations. Prior to June 30, 2017, regulatory minimum requirements with regard to the respective coverage ratio thresholds have been met at all times. These ratios excluded the exposures permanently assigned to the standardized approach (according to Article 150 CRR), other IRBA exposure as well as securitization positions.

The table below shows the Group-related EAD covered by the standardized, advanced and foundation IRB and split them out into the major regulatory exposure classes. Please note: The below EAD constitutes the EAD as reported for the Group in this report and does not reflect the specific requirements for the coverage ratio calculation stipulated in Section 11 SolvV as outlined in the paragraph above.

EAD within the group covered by the standardized, FIRB and AIRB approaches by exposure class

| in % | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|----------------------------|---------------|-----------------|-----------------------|------------|---------------|-----------------|-----------------------|------------|
| | Advanced IRBA | Foundation IRBA | Standardized Approach | Total | Advanced IRBA | Foundation IRBA | Standardized Approach | Total |
| Sovereign related exposure | 14 | 0 | 15 | 29 | 13 | 0 | 18 | 32 |
| Institutions | 5 | 0 | 1 | 7 | 6 | 0 | 2 | 8 |
| Corporates | 37 | 1 | 2 | 40 | 35 | 1 | 1 | 37 |
| Retail | 23 | 0 | 1 | 23 | 21 | 0 | 0 | 21 |
| Other items | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 2 |
| Total | 80 | 1 | 19 | 100 | 76 | 1 | 23 | 100 |

Article 452 (b)(i) CRR - Mapping of internal rating scales to external ratings

The table below sets out the mapping of internal ratings to obligor default probabilities following the internal rating process as outlined in the section "Article 452 (c) CRR - Internal rating-based approaches" on page 82 in this report as well as chapter "Credit risk management", section "Measuring credit risk" in our Annual Report 2018 on page 62. All internal ratings and

scorings are based on a uniform master scale, which assigns each rating or scoring result to the default probability determined for that class.

Internal Ratings and Probability of Defaults

| Internal rating | PD range in % |
|-----------------|-----------------|
| iAAA | > 0.00 ≤ 0.01 |
| iAA+ | > 0.01 ≤ 0.02 |
| iAA | > 0.02 ≤ 0.03 |
| iAA- | > 0.03 ≤ 0.04 |
| iA+ | > 0.04 ≤ 0.05 |
| iA | > 0.05 ≤ 0.07 |
| iA- | > 0.07 ≤ 0.11 |
| iBBB+ | > 0.11 ≤ 0.18 |
| iBBB | > 0.18 ≤ 0.30 |
| iBBB- | > 0.30 ≤ 0.50 |
| iBB+ | > 0.50 ≤ 0.83 |
| iBB | > 0.83 ≤ 1.37 |
| iBB- | > 1.37 ≤ 2.27 |
| iB+ | > 2.27 ≤ 3.75 |
| iB | > 3.75 ≤ 6.19 |
| iB- | > 6.19 ≤ 10.22 |
| iCCC+ | > 10.22 ≤ 16.87 |
| iCCC | > 16.87 ≤ 27.84 |
| iCCC- | > 27.84 ≤ 99.99 |
| Default | 100.00 |

Article 452 (b)(ii) CRR - Use of internal ratings

Please refer to the section “Article 452 (c) CRR - Internal rating-based approaches” below on page 82.

Article 452 (b)(iii) CRR - Management and recognition of credit risk mitigation

Please refer to section “Article 453 (f-g) CRR - Overview of credit risk mitigation techniques” within this report on page 74 as well as to the Annual Report 2018, section “Managing and mitigation of credit risk” on page 66.

Article 452 (b)(iv) CRR - Controls around ratings systems

Credit Risk Advanced IRBA – Model Validation

As an important element of our risk management framework we regularly validate our rating methodologies and credit risk parameters. Whereas the rating methodology validation focuses on the discriminatory power of the models, the risk parameter validation for PD, LGD and EAD analyzes the predictive power of those parameters when compared against historical default and loss experiences as well as drawing behavior.

According to our standards, and in line with the CRR-defined minimum requirements, the parameters PD, LGD and EAD are reviewed annually. The validation process for parameters as used by Deutsche Bank is coordinated and supervised by Deutsche Bank’s Model Risk function. Credit Risk parameter validations consist of quantitative analyses of internal historical data and are enriched by qualitative assessments in case data for validation is not statistically sufficient for reliable validation results. A recalibration of specific parameter settings is triggered based on validation results if required. In addition to annual validations, ad hoc reviews are performed where appropriate as a reaction to quality deterioration at an early stage due to systematic changes of input factors (e.g., changes in payment behavior) or changes in the structure of the portfolio.

For quantitative details of our validation results please refer to section “Article 452 (h-i) CRR - Model validation results and expected versus actual losses” of this Pillar 3 Report on the pages 100.

Article 452 (c) CRR - Internal rating-based approaches

Advanced Internal Ratings Based Approach

The advanced IRBA is the most sophisticated approach available under the regulatory framework for credit risk and allows us to make use of our internal rating methodologies as well as internal estimates of specific other risk parameters. These methods and parameters represent long-used key components of the internal risk measurement and management process supporting

the credit approval process, the economic capital and expected loss calculation and the internal monitoring and reporting of credit risk. The relevant parameters include the probability of default (“PD”), the loss given default (“LGD”) and the maturity (“M”) driving the regulatory risk-weight and the credit conversion factor (“CCF”) as part of the regulatory exposure at default (“EAD”) estimation. For most of our internal rating systems more than seven years of historical information is available to assess these parameters. Our internal rating methodologies aim at point-in-time rather than a through-the-cycle rating.

The probability of default for customers is derived from our internal rating systems. We assign a probability of default to each relevant counterparty credit exposure as a function of a transparent and consistent 21-grade master rating scale for all of our exposure (excluding parts of Postbank).

A prerequisite for the development of rating methodologies and the determination of risk parameters is a proper definition, identification and recording of the default event of a customer. We apply a default definition in accordance with the requirements of Article 178 CRR as confirmed by the BaFin and ECB as part of the IRBA approval process. With the introduction of IFRS9, Deutsche Bank has aligned its definition of “credit impaired” under IFRS 9 to the default definition as per Art. 178 of the Capital Requirements Regulation (CRR) for regulatory purposes. As a consequence, Stage 3 Financial Assets consist of two types of defaulted financial assets: firstly financial assets, where the Group expects an impairment loss reflected in an allowance for credit losses and secondly financial assets, where the group does not expect an impairment loss (e.g., due to high quality collateral or sufficient expected future cash flows following thorough due diligence). This is a major difference to our impairment definition under IAS 39, where Financial Assets were only considered to be impaired if the Group expected to suffer an impairment loss.

The borrower ratings assigned are derived on the grounds of internally developed rating models which specify consistent and distinct customer-relevant criteria and assign a rating grade based on a specific set of criteria as given for a certain customer. The set of criteria is generated from information sets relevant for the respective customer segments like general customer behavior, financial and external data. The methods in use range from statistical scoring models to expert-based models taking into account the relevant available quantitative and qualitative information. Expert-based models are usually applied for counterparts in the exposure classes “Central governments and central banks”, “Institutions” and “Corporates” with the exception of “Corporates” segments for which sufficient data basis is available for statistical scoring models. For the latter as well as for the retail segment statistical scoring or hybrid models combining both approaches are commonly used. Quantitative rating methodologies are developed based on applicable statistical modeling techniques, such as logistic regression. In line with Article 174 CRR, these models are complemented by human judgment and oversight to review model-based assignments and are intended to ensure that the models are used appropriately. When we assign our internal risk ratings, it allows us to compare them with external risk ratings assigned to our counterparties by the major international rating agencies, where possible, as our internal rating scale has been designed to principally correspond to the external rating scales from rating agencies.

Ratings for central governments and central banks take into account economic, political and sociodemographic indicators, e.g. the political dynamics in a country. The model incorporates relevant aspects covered in the fields of empirical country risk analysis and early warning crisis models to arrive at an overall risk evaluation.

The majority of ratings for corporate and institutions combine quantitative analysis of financial information with qualitative assessments of, inter alia, industry trends, market position and management experience. Financial analysis has a specific focus on cash flow generation and the counterparty’s capability to service its debts, also in comparison to peers. We supplement the analysis of financials by an internal forecast of the counterparty’s financial profile where deemed to be necessary. For purchased corporate receivables the corporate rating approach is applied.

Ratings for SME clients are based on automated sub-ratings for e.g. financial aspects and conduct of bank account. Specialized lending is managed by specific credit risk management teams, e.g. for real estate, ship finance or leveraged transactions. Following the individual characteristic of the underlying credit transactions we have developed bespoke scorecards where appropriate to derive credit ratings.

In our retail business, creditworthiness checks and counterparty ratings are generally derived by utilizing an automated decision engine. The decision engine incorporates quantitative aspects (i.e., financial figures), behavioral aspects, credit bureau information (such as SCHUFA in Germany) and general customer data. These input factors are used by the decision engine to determine the creditworthiness of the borrower and, after consideration of collateral, the expected loss. The established rating procedures we have implemented in our retail business are based on multivariate statistical methods. For the portfolios in the former Postbank, separate rating tools based on product specific scores are still applied. Alignment projects are in place to harmonize these with group wide applied counterparty centric view.

They are used to support our individual credit decisions for the retail portfolio as well as to continuously monitor it in an automated fashion. In case elevated risks are identified as part to this monitoring process or new regulatory requirements apply, credit ratings are reviewed on an individual basis for these affected counterparties

Although different rating methodologies are applied to the various customer segments in order to properly reflect customer-specific characteristics, they all adhere to the same risk management principles. Credit process policies provide guidance on the classification of customers into the various rating systems.

We apply internally estimated LGD factors as part of the advanced IRBA capital requirement calculation as approved by the BaFin and ECB. LGD is defined as the likely loss intensity in case of a counterparty default. It provides an estimation of the exposure that cannot be recovered in a default event and therefore captures the severity of a loss. Conceptually, LGD estimates are independent of a customer's probability of default. The LGD models ensure that the main drivers for losses (i.e., different levels and quality of collateralization and customer or product types or seniority of facility) are reflected in specific LGD factors. In our LGD models, except for the former Postbank portfolios, we assign collateral type specific LGD parameters to the collateralized exposure (collateral value after application of haircuts). Moreover, the LGD for uncollateralized exposure cannot be below the LGD assigned to collateralized exposure and regulatory floors (e.g. 10 % for residential mortgage loans) are applied. For the former Postbank portfolios, individually modeled LGD parameters are in use.

As part of the application of the advanced IRBA we apply specific CCFs in order to calculate an EAD value. Conceptually the EAD is defined as the expected amount of the credit exposure to a counterparty at the time of its default. For advanced IRBA calculation purposes we apply the general principles as defined in Article 166 CRR to determine the EAD of a transaction. In instances, however, where a transaction involves an unused limit, a percentage share of this unused limit is added to the outstanding amount in order to appropriately reflect the expected outstanding amount in case of a counterparty default. This reflects the assumption that for commitments the utilization at the time of default might be higher than the current utilization. When a transaction involves an additional contingent component (i.e., guarantees) a further percentage share (usage factor) is applied as part of the CCF model in order to estimate the amount of guarantees drawn in case of default. Where allowed under the advanced IRBA, the CCFs are internally estimated. The calibrations of such parameters are based on statistical experience as well as internal historical data and consider customer and product type specifics. As part of the approval process, the BaFin and ECB assessed our CCF models and stated their appropriateness for use in the process of regulatory capital requirement calculations.

The EAD for our derivatives and securities financing transactions ("SFT") portfolios are primarily calculated based on the IMM approach as described in the section "Counterparty credit risk" of this report on the pages 122 to 137.

Foundation Internal Ratings Based Approach

The foundation IRBA is an approach available under the regulatory framework for credit risk allowing institutions to make use of their internal rating methodologies while using pre-defined regulatory values for all other risk parameters. Parameters subject to internal estimates include the probability of default ("PD") while the loss given default ("LGD") and the credit conversion factor ("CCF") are defined in the regulatory framework.

A probability of default is assigned to each relevant counterparty credit exposure as a function of a transparent and consistent rating master scale. The borrower ratings assigned are derived on the grounds of internally developed rating models which specify consistent and distinct customer-relevant criteria and assign a rating grade based on a specific set of criteria as given for a certain customer following the approaches as outlined for our Advanced IRBA rating systems. Our Project Finance exposure (Specialized Lending) is reported under the foundation IRBA, but regulatory risk weights are applied using the so-called 'supervisory slotting criteria' approach as defined by Article 153 CRR.

For the foundation IRBA we apply the same default definition as for Advanced IRBA in accordance with the requirements of Article 178 CRR as confirmed by the BaFin as part of its IRBA approval process.

Assignment to regulatory exposure classes

The advanced and foundation IRBA requires differentiating a bank's credit portfolio into various regulatory defined exposure classes. We identify the relevant regulatory exposure class for each exposure by taking into account factors like customer-specific characteristics, the rating system used as well as certain materiality thresholds which are regulatory defined.

As an IRBA institution, we are required to treat equity investments, collective investment undertakings ("CIU") and other non-credit obligation assets generally within the IRBA. For these exposure types typically regulatory-defined IRBA risk weights are applied. For certain CIUs, i.e. the CIUs in the former Postbank-portfolio within DB Privat- und Firmenkundenbank AG and a smaller CIU-portfolio at DWS, we apply a "look through"-approach and derive the risk weights based on the underlying positions.

We use the simple risk-weight approach according to Article 155 (2) CRR for our investments in equity positions. It distinguishes between exposure in equities which are non-exchange traded but sufficiently diversified, exchange-traded and other non-exchange-traded and then uses the regulatory-defined risk weights of 190 %, 290 % or 370 %, respectively. We

also include exposures attracting a risk weight of 250 % according to Article 48 (4) for significant investments in the CET 1 instruments of financial sector entities which are subject to the threshold exemptions as outlined in Article 48 CRR.

Exposures which are assigned to the exposure class “other non-credit obligation assets” receive an IRBA risk weight of 0 % in case of cash positions, 250 % for deferred tax assets that rely on future profitability and arise from temporary differences subject to the threshold exemptions as outlined in Article 48 CRR, or 100 %.

Quantitative information on the use of the IRB approach

Article 452 (d-g) CRR - Advanced IRB exposure

The following series of tables details the Group’s advanced IRB exposure distributed on our internal rating scale, separately for all relevant regulatory exposure classes. They exclude the counterparty credit risk position from derivatives and securities financing transactions which are presented separately in the section “Counterparty credit risk” later in this report.

The tables show the EAD gross as well as the off-balance sheet exposure with their corresponding exposure-weighted credit conversion factors. All undrawn commitment exposure values shown below are assigned to the exposure class of their original counterparty and not to the exposure class of the protection seller.

In addition they provide the EAD net after CRM and CCF, where exposures covered by guarantees or credit derivatives is assigned to the protection seller. As a consequence the EAD net can be higher than the original balance sheet exposure.

The EAD net is presented in conjunction with exposures-weighted average PD, LGD, maturity as well as the RWA and the average risk weight (RW). The effect of double default, as far as applicable to exposures outside of former Postbank, is considered in the average RW. It implies that for a guaranteed exposure a loss only occurs if the primary obligor and the guarantor fail to meet their obligations at the same time. The tables provide the defaulted exposure separately, where we apply a LGD conception already incorporating potential unexpected losses in the loss rate estimate as required by Article 181 (1) (h) CRR.

Further details in the tables are number of obligors, expected loss and provisions.

EU CR6 – AIRB approach – Credit risk exposures by exposure class and PD range

| | | | | | | | | | | | | Dec 31, 2018 |
|--|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|---------------|----------------------|------------------|---|
| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Central governments and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | 107,189 | 250 | 41.68 | 115,108 | 0.01 | 0.1 | 49.97 | 3.4 | 1,598 | 1.39 | 3 | – |
| 0.15 to <0.25 | 3,496 | 0 | 100.00 | 3,527 | 0.23 | <0.1 | 50.00 | 1.5 | 1,547 | 43.86 | 4 | – |
| 0.25 to <0.50 | 837 | 110 | 100.00 | 762 | 0.39 | <0.1 | 50.00 | 1.4 | 450 | 59.04 | 1 | – |
| 0.50 to <0.75 | 289 | 0 | 99.86 | 276 | 0.64 | <0.1 | 49.58 | 1.1 | 199 | 71.83 | 1 | – |
| 0.75 to <2.50 | 307 | 80 | 33.92 | 150 | 1.23 | <0.1 | 43.68 | 2.4 | 148 | 98.62 | 1 | – |
| 2.50 to <10.00 | 1,144 | 263 | 100.00 | 513 | 4.35 | <0.1 | 48.41 | 2.7 | 438 | 85.27 | 5 | – |
| 10.00 to <100.00 | 496 | 65 | 100.00 | 43 | 13.00 | <0.1 | 19.96 | 1.5 | 40 | 92.83 | 2 | – |
| 100.00 (Default) | 88 | 0 | 0 | 32 | 100.00 | <0.1 | 22.91 | 3.2 | 22 | 68.72 | 5 | – |
| Sub-total | 113,845 | 769 | 44.74 | 120,412 | 0.07 | 0.2 | 49.94 | 3.3 | 4,441 | 3.69 | 21 | 21 |
| Dilution risk | 44 | 4 | 100.00 | 48 | 10.45 | 0 | 2.42 | 1.0 | 5 | 10.18 | 0 | 0 |
| Sub-total incl. dilution risk | 113,889 | 773 | 44.81 | 120,460 | 0.07 | 0.2 | 49.92 | 3.3 | 4,446 | 3.69 | 21 | 21 |
| Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 13,177 | 4,857 | 40.40 | 19,491 | 0.05 | 0.5 | 45.35 | 1.7 | 2,204 | 11.31 | 3 | – |
| 0.15 to <0.25 | 618 | 485 | 38.67 | 785 | 0.23 | 0.1 | 27.10 | 1.6 | 213 | 27.09 | 1 | – |
| 0.25 to <0.50 | 581 | 393 | 49.04 | 801 | 0.39 | 0.1 | 29.53 | 1.6 | 368 | 45.89 | 1 | – |
| 0.50 to <0.75 | 879 | 209 | 61.27 | 1,167 | 0.64 | <0.1 | 30.48 | 2.5 | 675 | 57.84 | 2 | – |
| 0.75 to <2.50 | 1,512 | 292 | 40.96 | 1,562 | 1.57 | 0.1 | 21.22 | 1.2 | 620 | 39.73 | 4 | – |
| 2.50 to <10.00 | 1,242 | 263 | 75.07 | 1,354 | 3.44 | <0.1 | 10.83 | 2.6 | 413 | 30.49 | 5 | – |
| 10.00 to <100.00 | 118 | 68 | 21.19 | 126 | 13.77 | <0.1 | 4.48 | 1.1 | 28 | 22.30 | 1 | – |
| 100.00 (Default) | 263 | 4 | 28.87 | 264 | 100.00 | <0.1 | 17.25 | 1.5 | 19 | 7.14 | 44 | – |
| Sub-total | 18,390 | 6,572 | 41.27 | 25,551 | 1.47 | 0.8 | 39.82 | 1.7 | 4,540 | 17.77 | 61 | 55 |
| Dilution risk | 104 | 0 | 0 | 104 | 10.45 | 0 | 2.41 | 1.0 | 11 | 10.16 | 0 | 0 |
| Sub-total incl. dilution risk | 18,494 | 6,572 | 41.27 | 25,655 | 1.51 | 0.8 | 39.66 | 1.7 | 4,550 | 17.74 | 61 | 55 |
| Corporates | | | | | | | | | | | | |
| 0.00 to <0.15 | 57,688 | 123,134 | 27.73 | 92,905 | 0.08 | 19.2 | 31.46 | 2.0 | 16,446 | 17.70 | 26 | – |
| 0.15 to <0.25 | 19,136 | 24,353 | 30.08 | 26,753 | 0.23 | 6.2 | 33.77 | 2.2 | 9,031 | 33.76 | 20 | – |
| 0.25 to <0.50 | 14,618 | 15,409 | 29.56 | 19,272 | 0.39 | 5.8 | 26.50 | 2.3 | 6,809 | 35.33 | 19 | – |
| 0.50 to <0.75 | 14,042 | 11,422 | 31.71 | 17,022 | 0.65 | 4.7 | 24.63 | 2.5 | 7,189 | 42.23 | 31 | – |
| 0.75 to <2.50 | 26,568 | 24,270 | 31.13 | 32,188 | 1.46 | 6.5 | 23.45 | 2.9 | 17,119 | 53.18 | 106 | – |
| 2.50 to <10.00 | 22,381 | 27,022 | 32.21 | 27,750 | 4.84 | 3.6 | 19.12 | 2.7 | 17,590 | 63.39 | 230 | – |
| 10.00 to <100.00 | 7,895 | 4,873 | 31.27 | 8,774 | 17.62 | 0.9 | 9.68 | 1.9 | 4,265 | 48.61 | 150 | – |
| 100.00 (Default) | 7,462 | 794 | 50.78 | 7,675 | 100.00 | 1.3 | 42.91 | 1.8 | 1,515 | 19.74 | 3,089 | – |
| Sub-total | 169,789 | 231,278 | 29.26 | 232,339 | 4.89 | 48.1 | 27.79 | 2.3 | 79,965 | 34.42 | 3,671 | 3,087 |
| Dilution risk | 4,214 | 605 | 33.64 | 4,578 | 10.45 | 0 | 2.47 | 1.0 | 476 | 10.41 | 12 | 0 |
| Sub-total incl. dilution risk | 174,003 | 231,883 | 29.27 | 236,917 | 4.99 | 48.1 | 27.30 | 2.3 | 80,441 | 33.95 | 3,683 | 3,087 |

Dec 31, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|--------------------------------------|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|---------------|----------------------|------------------|---|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| of which: | | | | | | | | | | | | |
| SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 3,149 | 3,082 | 29.89 | 4,220 | 0.09 | 6.1 | 34.43 | 2.9 | 822 | 19.47 | 1 | – |
| 0.15 to <0.25 | 1,343 | 897 | 39.00 | 1,734 | 0.23 | 2.3 | 36.04 | 3.0 | 560 | 32.31 | 1 | – |
| 0.25 to <0.50 | 1,464 | 939 | 35.37 | 1,705 | 0.39 | 2.5 | 33.33 | 2.9 | 669 | 39.25 | 2 | – |
| 0.50 to <0.75 | 1,269 | 738 | 34.74 | 1,410 | 0.65 | 2.1 | 36.75 | 3.2 | 784 | 55.56 | 3 | – |
| 0.75 to <2.50 | 1,940 | 827 | 30.99 | 1,937 | 1.44 | 2.7 | 36.95 | 2.8 | 1,361 | 70.26 | 10 | – |
| 2.50 to <10.00 | 1,020 | 499 | 33.48 | 934 | 4.72 | 1.3 | 31.71 | 2.7 | 728 | 78.00 | 14 | – |
| 10.00 to <100.00 | 254 | 66 | 18.27 | 215 | 20.64 | 0.3 | 27.65 | 2.8 | 250 | 116.27 | 13 | – |
| 100.00 (Default) | 475 | 61 | 24.62 | 456 | 100.00 | 0.3 | 44.69 | 1.6 | 104 | 22.70 | 196 | – |
| Sub-total | 10,914 | 7,107 | 32.54 | 12,612 | 4.73 | 17.5 | 35.21 | 2.9 | 5,277 | 41.84 | 242 | 227 |
| Dilution risk | 2 | 0 | 0 | 5 | 10.45 | 0 | 5.09 | 1.0 | 1 | 21.48 | 0 | 0 |
| Sub-total incl. dilution risk | 10,916 | 7,107 | 32.54 | 12,617 | 4.73 | 17.5 | 35.19 | 2.9 | 5,278 | 41.84 | 242 | 227 |
| Specialized Lending | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,433 | 8 | 24.33 | 1,374 | 0.09 | 0.1 | 4.94 | 3.4 | 52 | 3.81 | 0 | – |
| 0.15 to <0.25 | 2,136 | 121 | 46.04 | 2,180 | 0.22 | 0.1 | 9.22 | 3.0 | 225 | 10.33 | 0 | – |
| 0.25 to <0.50 | 1,920 | 30 | 82.60 | 1,729 | 0.39 | 0.1 | 14.51 | 3.4 | 456 | 26.40 | 1 | – |
| 0.50 to <0.75 | 2,165 | 375 | 43.15 | 2,268 | 0.66 | 0.1 | 12.29 | 3.2 | 578 | 25.49 | 2 | – |
| 0.75 to <2.50 | 6,045 | 601 | 68.56 | 6,279 | 1.41 | 0.3 | 11.13 | 2.7 | 1,795 | 28.59 | 10 | – |
| 2.50 to <10.00 | 8,267 | 1,645 | 30.54 | 8,356 | 5.38 | 0.3 | 7.72 | 2.3 | 2,269 | 27.15 | 31 | – |
| 10.00 to <100.00 | 6,131 | 1,260 | 26.87 | 6,452 | 16.57 | 0.2 | 5.93 | 1.7 | 1,996 | 30.94 | 66 | – |
| 100.00 (Default) | 2,510 | 128 | 26.30 | 2,528 | 100.00 | 0.2 | 45.40 | 1.9 | 470 | 18.58 | 1,110 | – |
| Sub-total | 30,605 | 4,169 | 36.58 | 31,166 | 13.36 | 1.2 | 11.79 | 2.5 | 7,842 | 25.16 | 1,220 | 1,072 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 30,605 | 4,169 | 36.58 | 31,166 | 13.36 | 1.2 | 11.79 | 2.5 | 7,842 | 25.16 | 1,220 | 1,072 |
| Other | | | | | | | | | | | | |
| 0.00 to <0.15 | 53,106 | 120,044 | 27.67 | 87,311 | 0.08 | 13.0 | 31.73 | 1.9 | 15,573 | 17.84 | 25 | – |
| 0.15 to <0.25 | 15,657 | 23,336 | 29.63 | 22,839 | 0.23 | 3.8 | 35.94 | 2.1 | 8,246 | 36.10 | 19 | – |
| 0.25 to <0.50 | 11,234 | 14,440 | 29.08 | 15,838 | 0.39 | 3.2 | 27.07 | 2.1 | 5,683 | 35.88 | 16 | – |
| 0.50 to <0.75 | 10,609 | 10,310 | 31.16 | 13,343 | 0.64 | 2.5 | 25.45 | 2.3 | 5,827 | 43.67 | 26 | – |
| 0.75 to <2.50 | 18,582 | 22,842 | 30.11 | 23,972 | 1.47 | 3.5 | 25.59 | 2.9 | 13,963 | 58.24 | 86 | – |
| 2.50 to <10.00 | 13,094 | 24,878 | 32.30 | 18,460 | 4.60 | 2.0 | 23.64 | 2.9 | 14,593 | 79.05 | 185 | – |
| 10.00 to <100.00 | 1,510 | 3,547 | 33.30 | 2,107 | 20.52 | 0.4 | 19.33 | 2.3 | 2,019 | 95.85 | 70 | – |
| 100.00 (Default) | 4,478 | 605 | 58.46 | 4,690 | 100.00 | 0.8 | 41.39 | 1.8 | 942 | 20.08 | 1,782 | – |
| Sub-total | 128,270 | 220,002 | 29.02 | 188,562 | 3.50 | 29.4 | 29.93 | 2.2 | 66,845 | 35.45 | 2,209 | 1,788 |
| Dilution risk | 4,212 | 605 | 33.64 | 4,573 | 10.45 | 0 | 2.47 | 1.0 | 475 | 10.40 | 12 | 0 |
| Sub-total incl. dilution risk | 132,482 | 220,607 | 29.03 | 193,135 | 3.66 | 29.4 | 29.28 | 2.2 | 67,321 | 34.86 | 2,220 | 1,788 |

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| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|---|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|---------------|----------------------|------------------|---|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Retail | | | | | | | | | | | | |
| 0.00 to <0.15 | 25,612 | 16,092 | 63.58 | 35,186 | 0.10 | 2,751.2 | 15.00 | 10.3 | 1,371 | 3.90 | 9 | – |
| 0.15 to <0.25 | 31,883 | 6,093 | 77.10 | 36,146 | 0.22 | 1,302.1 | 15.79 | 6.8 | 2,681 | 7.42 | 15 | – |
| 0.25 to <0.50 | 35,807 | 4,041 | 66.11 | 38,530 | 0.39 | 863.7 | 16.74 | 7.8 | 4,405 | 11.43 | 26 | – |
| 0.50 to <0.75 | 35,463 | 3,241 | 68.66 | 37,728 | 0.67 | 845.4 | 18.21 | 7.5 | 6,766 | 17.93 | 48 | – |
| 0.75 to <2.50 | 35,656 | 3,539 | 70.40 | 38,136 | 1.46 | 1,433.4 | 23.45 | 8.6 | 12,777 | 33.50 | 139 | – |
| 2.50 to <10.00 | 18,276 | 1,870 | 79.37 | 19,494 | 4.52 | 867.3 | 27.34 | 6.5 | 11,014 | 56.50 | 248 | – |
| 10.00 to <100.00 | 4,015 | 180 | 70.52 | 4,022 | 20.71 | 188.6 | 27.55 | 6.4 | 3,805 | 94.60 | 234 | – |
| 100.00 (Default) | 4,081 | 55 | 58.38 | 4,097 | 100.00 | 165.7 | 43.57 | 3.0 | 659 | 16.08 | 1,750 | – |
| Sub-total | 190,795 | 35,111 | 68.69 | 213,340 | 3.22 | 8,417.2 | 19.44 | 7.9 | 43,477 | 20.38 | 2,469 | 2,634 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 190,795 | 35,111 | 68.69 | 213,340 | 3.22 | 8,417.2 | 19.44 | 7.9 | 43,477 | 20.38 | 2,469 | 2,634 |
| of which: | | | | | | | | | | | | |
| Secured by real estate property SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,145 | 132 | 59.41 | 1,221 | 0.12 | 6.7 | 11.33 | 14.8 | 35 | 2.89 | 0 | – |
| 0.15 to <0.25 | 1,573 | 120 | 58.29 | 1,637 | 0.23 | 7.9 | 11.25 | 15.3 | 76 | 4.62 | 0 | – |
| 0.25 to <0.50 | 1,774 | 99 | 55.68 | 1,820 | 0.39 | 8.6 | 11.49 | 15.7 | 126 | 6.91 | 1 | – |
| 0.50 to <0.75 | 1,558 | 71 | 53.46 | 1,581 | 0.64 | 7.4 | 11.64 | 15.7 | 157 | 9.91 | 1 | – |
| 0.75 to <2.50 | 1,835 | 101 | 55.29 | 1,867 | 1.34 | 9.1 | 11.57 | 15.9 | 296 | 15.85 | 3 | – |
| 2.50 to <10.00 | 775 | 24 | 52.07 | 775 | 4.31 | 3.9 | 10.79 | 15.0 | 224 | 28.86 | 4 | – |
| 10.00 to <100.00 | 152 | 3 | 42.47 | 147 | 21.91 | 0.9 | 11.99 | 14.6 | 86 | 58.54 | 4 | – |
| 100.00 (Default) | 120 | 0 | 45.94 | 119 | 100.00 | 0.4 | 34.70 | 11.2 | 18 | 14.89 | 41 | – |
| Sub-total | 8,931 | 552 | 56.58 | 9,167 | 2.53 | 45.0 | 11.72 | 15.4 | 1,017 | 11.09 | 54 | 64 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 8,931 | 552 | 56.58 | 9,167 | 2.53 | 45.0 | 11.72 | 15.4 | 1,017 | 11.09 | 54 | 64 |
| Secured by real estate property non-SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 22,242 | 551 | 68.76 | 22,615 | 0.10 | 239.3 | 12.81 | 14.5 | 766 | 3.39 | 3 | – |
| 0.15 to <0.25 | 27,992 | 1,203 | 86.21 | 29,024 | 0.22 | 245.8 | 14.36 | 7.1 | 1,905 | 6.56 | 9 | – |
| 0.25 to <0.50 | 31,187 | 1,357 | 82.09 | 32,289 | 0.39 | 253.5 | 14.45 | 7.9 | 3,267 | 10.12 | 18 | – |
| 0.50 to <0.75 | 30,225 | 1,423 | 83.95 | 31,396 | 0.67 | 232.7 | 15.19 | 7.6 | 4,952 | 15.77 | 32 | – |
| 0.75 to <2.50 | 23,955 | 1,887 | 87.10 | 25,555 | 1.43 | 197.0 | 14.08 | 10.2 | 6,119 | 23.94 | 51 | – |
| 2.50 to <10.00 | 9,830 | 1,223 | 94.44 | 10,959 | 4.53 | 89.9 | 13.35 | 8.3 | 4,881 | 44.54 | 67 | – |
| 10.00 to <100.00 | 2,279 | 85 | 92.10 | 2,338 | 20.97 | 18.4 | 14.81 | 8.6 | 1,973 | 84.36 | 74 | – |
| 100.00 (Default) | 1,582 | 14 | 84.83 | 1,591 | 100.00 | 14.3 | 20.92 | 5.6 | 211 | 13.27 | 333 | – |
| Sub-total | 149,292 | 7,744 | 85.41 | 155,768 | 2.16 | 1,290.9 | 14.28 | 9.1 | 24,073 | 15.45 | 589 | 594 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 149,292 | 7,744 | 85.41 | 155,768 | 2.16 | 1,290.9 | 14.28 | 9.1 | 24,073 | 15.45 | 589 | 594 |

Dec 31, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|--------------------------------------|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|----------------|----------------------|------------------|---|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Qualifying Revolving | | | | | | | | | | | | |
| 0.00 to <0.15 | 51 | 10,272 | 88.55 | 7,277 | 0.07 | 2,250.9 | 11.19 | 0.0 | 214 | 2.94 | 4 | – |
| 0.15 to <0.25 | 98 | 3,142 | 92.03 | 2,365 | 0.19 | 847.9 | 6.07 | 0.0 | 163 | 6.90 | 3 | – |
| 0.25 to <0.50 | 142 | 1,005 | 79.21 | 819 | 0.38 | 396.5 | 14.99 | 0.0 | 90 | 11.00 | 2 | – |
| 0.50 to <0.75 | 175 | 650 | 73.32 | 592 | 0.67 | 348.5 | 18.08 | 0.0 | 102 | 17.30 | 2 | – |
| 0.75 to <2.50 | 290 | 531 | 71.01 | 626 | 1.49 | 422.9 | 21.66 | 0.0 | 194 | 31.07 | 5 | – |
| 2.50 to <10.00 | 195 | 185 | 73.16 | 313 | 4.68 | 242.8 | 22.20 | 0.0 | 220 | 70.22 | 8 | – |
| 10.00 to <100.00 | 53 | 18 | 75.42 | 64 | 20.11 | 50.3 | 24.26 | 0.0 | 95 | 147.95 | 7 | – |
| 100.00 (Default) | 70 | 2 | 61.51 | 71 | 100.00 | 34.4 | 60.96 | 0.0 | 48 | 67.56 | 43 | – |
| Sub-total | 1,073 | 15,803 | 87.03 | 12,126 | 1.03 | 4,594.3 | 11.96 | 0.0 | 1,126 | 9.29 | 74 | 80 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 1,073 | 15,803 | 87.03 | 12,126 | 1.03 | 4,594.3 | 11.96 | 0.0 | 1,126 | 9.29 | 74 | 80 |
| Other retail SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 362 | 2,314 | 18.90 | 1,019 | 0.11 | 31.7 | 42.19 | 3.9 | 95 | 9.28 | 0 | – |
| 0.15 to <0.25 | 409 | 904 | 31.02 | 779 | 0.23 | 36.1 | 42.06 | 3.9 | 122 | 15.69 | 1 | – |
| 0.25 to <0.50 | 535 | 871 | 28.64 | 910 | 0.39 | 34.7 | 46.26 | 3.7 | 221 | 24.32 | 2 | – |
| 0.50 to <0.75 | 581 | 568 | 29.39 | 857 | 0.65 | 25.5 | 51.89 | 3.0 | 307 | 35.83 | 3 | – |
| 0.75 to <2.50 | 979 | 555 | 33.42 | 1,230 | 1.36 | 25.0 | 54.91 | 2.8 | 636 | 51.75 | 9 | – |
| 2.50 to <10.00 | 674 | 252 | 35.05 | 562 | 4.45 | 14.3 | 52.90 | 2.6 | 355 | 63.19 | 13 | – |
| 10.00 to <100.00 | 181 | 40 | 36.72 | 110 | 21.42 | 4.3 | 51.04 | 2.9 | 100 | 91.46 | 12 | – |
| 100.00 (Default) | 244 | 13 | 37.24 | 241 | 100.00 | 3.4 | 62.59 | 2.1 | 50 | 20.58 | 150 | – |
| Sub-total | 3,965 | 5,518 | 26.01 | 5,708 | 5.57 | 174.9 | 49.10 | 3.3 | 1,887 | 33.05 | 191 | 223 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 3,965 | 5,518 | 26.01 | 5,708 | 5.57 | 174.9 | 49.10 | 3.3 | 1,887 | 33.05 | 191 | 223 |
| Other retail non-SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,814 | 2,823 | 30.97 | 3,054 | 0.09 | 411.4 | 32.79 | 3.5 | 261 | 8.55 | 1 | – |
| 0.15 to <0.25 | 1,812 | 723 | 66.37 | 2,340 | 0.22 | 237.1 | 37.76 | 4.5 | 416 | 17.76 | 2 | – |
| 0.25 to <0.50 | 2,169 | 709 | 66.10 | 2,693 | 0.39 | 243.2 | 38.38 | 5.0 | 700 | 26.01 | 4 | – |
| 0.50 to <0.75 | 2,924 | 529 | 65.28 | 3,302 | 0.67 | 295.2 | 41.33 | 4.3 | 1,248 | 37.81 | 9 | – |
| 0.75 to <2.50 | 8,597 | 464 | 47.96 | 8,859 | 1.58 | 867.4 | 48.76 | 3.8 | 5,532 | 62.44 | 70 | – |
| 2.50 to <10.00 | 6,801 | 185 | 46.09 | 6,886 | 4.54 | 558.2 | 49.63 | 3.3 | 5,335 | 77.48 | 155 | – |
| 10.00 to <100.00 | 1,351 | 35 | 53.67 | 1,362 | 20.11 | 123.9 | 49.36 | 2.3 | 1,550 | 113.80 | 136 | – |
| 100.00 (Default) | 2,066 | 26 | 54.61 | 2,075 | 100.00 | 117.3 | 58.64 | 0.8 | 332 | 16.02 | 1,184 | – |
| Sub-total | 27,533 | 5,494 | 45.69 | 30,571 | 9.30 | 2,853.8 | 45.50 | 3.6 | 15,375 | 50.29 | 1,562 | 1,672 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 27,533 | 5,494 | 45.69 | 30,571 | 9.30 | 2,853.8 | 45.50 | 3.6 | 15,375 | 50.29 | 1,562 | 1,672 |
| All exposure classes | | | | | | | | | | | | |
| Dilution risk | 4,363 | 609 | 34.10 | 4,730 | 10.45 | 0.4 | 2.47 | 1.0 | 492 | 10.40 | 12 | 0 |
| Total incl. dilution risk | 497,181 | 274,339 | 35.19 | 596,372 | 3.22 | 8,465.3 | 29.59 | 4.5 | 132,915 | 22.29 | 6,235 | 5,797 |

Jun 30, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|--|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|---------------|----------------------|------------------|---|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Central governments and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | 112,425 | 256 | 56.41 | 119,829 | 0.01 | 0.2 | 49.91 | 3.8 | 1,801 | 1.50 | 2 | – |
| 0.15 to <0.25 | 911 | 7 | 99.33 | 851 | 0.23 | <0.1 | 47.31 | 1.4 | 325 | 38.23 | 1 | – |
| 0.25 to <0.50 | 3,038 | 117 | 99.70 | 3,026 | 0.39 | <0.1 | 50.00 | 1.6 | 1,846 | 61.02 | 6 | – |
| 0.50 to <0.75 | 126 | 1 | 100.00 | 113 | 0.64 | <0.1 | 50.00 | 1.0 | 81 | 71.23 | 0 | – |
| 0.75 to <2.50 | 320 | 142 | 36.52 | 149 | 1.28 | <0.1 | 41.59 | 2.4 | 147 | 98.38 | 1 | – |
| 2.50 to <10.00 | 1,186 | 231 | 99.83 | 243 | 4.97 | <0.1 | 45.66 | 1.2 | 380 | 156.35 | 6 | – |
| 10.00 to <100.00 | 528 | 82 | 100.00 | 54 | 13.00 | <0.1 | 16.87 | 1.4 | 49 | 91.44 | 2 | – |
| 100.00 (Default) | 98 | 20 | 100.00 | 18 | 100.00 | <0.1 | 53.31 | 3.5 | 13 | 74.52 | 8 | – |
| Sub-total | 118,633 | 856 | 57.92 | 124,283 | 0.05 | 0.2 | 49.86 | 3.8 | 4,642 | 3.74 | 27 | 17 |
| Dilution risk | 41 | 2 | 100.00 | 43 | 15.85 | <0.1 | 3.82 | 1.0 | 8 | 18.77 | 0 | 0 |
| Sub-total incl. dilution risk | 118,673 | 858 | 57.95 | 124,326 | 0.05 | 0.2 | 49.85 | 3.8 | 4,650 | 3.74 | 27 | 17 |
| Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 14,951 | 3,410 | 37.64 | 20,996 | 0.06 | 0.5 | 46.45 | 1.6 | 2,145 | 10.22 | 3 | – |
| 0.15 to <0.25 | 219 | 197 | 37.62 | 304 | 0.23 | 0.1 | 50.82 | 1.2 | 100 | 33.05 | 0 | – |
| 0.25 to <0.50 | 2,162 | 766 | 47.54 | 2,506 | 0.39 | 0.1 | 19.65 | 1.5 | 947 | 37.79 | 3 | – |
| 0.50 to <0.75 | 1,740 | 326 | 64.02 | 1,944 | 0.64 | <0.1 | 18.81 | 2.7 | 752 | 38.69 | 3 | – |
| 0.75 to <2.50 | 1,386 | 277 | 58.64 | 1,452 | 1.54 | 0.1 | 16.60 | 1.4 | 473 | 32.58 | 2 | – |
| 2.50 to <10.00 | 498 | 179 | 37.88 | 507 | 3.98 | <0.1 | 9.68 | 1.6 | 158 | 31.23 | 2 | – |
| 10.00 to <100.00 | 163 | 79 | 50.39 | 189 | 18.46 | <0.1 | 4.26 | 1.3 | 42 | 22.41 | 2 | – |
| 100.00 (Default) | 278 | 6 | 27.49 | 280 | 100.00 | <0.1 | 8.69 | 2.5 | 28 | 10.05 | 22 | – |
| Sub-total | 21,396 | 5,241 | 39.05 | 28,176 | 1.39 | 0.9 | 39.35 | 1.6 | 4,647 | 16.49 | 38 | 53 |
| Dilution risk | 142 | 0 | 0 | 92 | 15.85 | <0.1 | 3.81 | 1.0 | 17 | 18.73 | 1 | 0 |
| Sub-total incl. dilution risk | 21,539 | 5,241 | 39.04 | 28,268 | 1.44 | 0.9 | 39.24 | 1.6 | 4,664 | 16.50 | 38 | 53 |
| Corporates | | | | | | | | | | | | |
| 0.00 to <0.15 | 60,829 | 121,789 | 28.65 | 97,828 | 0.08 | 19.5 | 31.32 | 2.0 | 17,999 | 18.40 | 29 | – |
| 0.15 to <0.25 | 15,340 | 24,487 | 29.87 | 22,773 | 0.22 | 6.0 | 33.04 | 2.3 | 7,633 | 33.52 | 17 | – |
| 0.25 to <0.50 | 15,184 | 15,337 | 31.08 | 19,576 | 0.39 | 5.7 | 28.81 | 2.3 | 7,666 | 39.16 | 22 | – |
| 0.50 to <0.75 | 12,407 | 12,242 | 36.06 | 15,231 | 0.65 | 4.9 | 28.48 | 2.5 | 7,243 | 47.55 | 27 | – |
| 0.75 to <2.50 | 23,619 | 23,489 | 31.52 | 28,618 | 1.45 | 6.6 | 23.15 | 2.9 | 15,963 | 55.78 | 94 | – |
| 2.50 to <10.00 | 21,040 | 26,852 | 32.75 | 25,974 | 4.91 | 3.8 | 18.49 | 2.8 | 16,935 | 65.20 | 231 | – |
| 10.00 to <100.00 | 8,000 | 3,717 | 35.20 | 8,787 | 17.99 | 0.9 | 9.08 | 1.8 | 4,113 | 46.81 | 157 | – |
| 100.00 (Default) | 8,000 | 2,095 | 25.08 | 8,111 | 100.00 | 1.4 | 26.52 | 2.6 | 2,070 | 25.51 | 1,959 | – |
| Sub-total | 164,420 | 230,007 | 30.14 | 226,898 | 5.15 | 48.7 | 27.55 | 2.3 | 79,622 | 35.09 | 2,536 | 3,575 |
| Dilution risk | 2,999 | 331 | 29.37 | 3,234 | 15.85 | 0.3 | 3.89 | 1.0 | 619 | 19.14 | 20 | 0 |
| Sub-total incl. dilution risk | 167,419 | 230,338 | 30.14 | 230,132 | 5.30 | 49.0 | 27.22 | 2.3 | 80,241 | 34.87 | 2,556 | 3,575 |

Jun 30, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|--------------------------------------|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|---------------|----------------------|------------------|---|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| of which: | | | | | | | | | | | | |
| SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 3,182 | 3,306 | 30.97 | 4,218 | 0.09 | 6.3 | 32.46 | 2.9 | 757 | 17.95 | 1 | – |
| 0.15 to <0.25 | 1,472 | 993 | 41.41 | 1,820 | 0.23 | 2.4 | 34.70 | 3.2 | 575 | 31.57 | 1 | – |
| 0.25 to <0.50 | 1,501 | 962 | 32.32 | 1,726 | 0.39 | 2.4 | 34.80 | 3.0 | 708 | 41.03 | 2 | – |
| 0.50 to <0.75 | 1,269 | 699 | 32.68 | 1,439 | 0.64 | 2.1 | 39.16 | 3.0 | 821 | 57.04 | 4 | – |
| 0.75 to <2.50 | 1,955 | 825 | 28.89 | 2,034 | 1.42 | 2.7 | 36.09 | 2.8 | 1,364 | 67.07 | 10 | – |
| 2.50 to <10.00 | 1,750 | 635 | 30.03 | 1,674 | 5.09 | 1.4 | 28.04 | 2.5 | 1,233 | 73.64 | 23 | – |
| 10.00 to <100.00 | 329 | 74 | 24.52 | 283 | 21.55 | 0.3 | 35.45 | 2.7 | 413 | 145.96 | 22 | – |
| 100.00 (Default) | 527 | 81 | 26.86 | 511 | 100.00 | 0.3 | 41.90 | 2.4 | 184 | 36.02 | 201 | – |
| Sub-total | 11,986 | 7,574 | 32.32 | 13,706 | 5.18 | 17.9 | 34.17 | 2.9 | 6,055 | 44.18 | 264 | 261 |
| Dilution risk | 33 | 0 | 0 | 41 | 15.85 | <0.1 | 4.32 | 1.0 | 9 | 21.24 | 0 | 0 |
| Sub-total incl. dilution risk | 12,019 | 7,574 | 32.32 | 13,747 | 5.21 | 18.0 | 34.08 | 2.9 | 6,063 | 44.11 | 264 | 261 |
| Specialized Lending | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,226 | 56 | 71.20 | 1,203 | 0.09 | 0.1 | 11.85 | 4.1 | 135 | 11.19 | 0 | – |
| 0.15 to <0.25 | 1,741 | 70 | 24.25 | 1,746 | 0.22 | 0.1 | 7.81 | 2.9 | 158 | 9.02 | 0 | – |
| 0.25 to <0.50 | 1,999 | 729 | 30.14 | 2,089 | 0.39 | 0.1 | 17.23 | 3.4 | 618 | 29.57 | 1 | – |
| 0.50 to <0.75 | 2,086 | 1,230 | 89.01 | 2,318 | 0.66 | 0.1 | 12.52 | 3.0 | 527 | 22.73 | 2 | – |
| 0.75 to <2.50 | 5,155 | 546 | 74.77 | 5,310 | 1.41 | 0.2 | 11.72 | 2.6 | 1,625 | 30.60 | 9 | – |
| 2.50 to <10.00 | 8,578 | 748 | 32.32 | 8,526 | 5.17 | 0.3 | 7.97 | 2.2 | 2,505 | 29.38 | 37 | – |
| 10.00 to <100.00 | 6,314 | 1,427 | 25.32 | 6,638 | 17.66 | 0.2 | 5.88 | 1.8 | 2,070 | 31.18 | 74 | – |
| 100.00 (Default) | 2,586 | 86 | 25.50 | 2,530 | 100.00 | 0.1 | 15.06 | 2.3 | 660 | 26.08 | 297 | – |
| Sub-total | 29,685 | 4,892 | 48.49 | 30,359 | 13.98 | 1.2 | 9.89 | 2.4 | 8,296 | 27.33 | 421 | 1,110 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 29,685 | 4,892 | 48.49 | 30,359 | 13.98 | 1.2 | 9.89 | 2.4 | 8,296 | 27.33 | 421 | 1,110 |
| Other | | | | | | | | | | | | |
| 0.00 to <0.15 | 56,422 | 118,427 | 28.56 | 92,407 | 0.08 | 13.2 | 31.52 | 1.9 | 17,108 | 18.51 | 28 | – |
| 0.15 to <0.25 | 12,127 | 23,424 | 29.39 | 19,207 | 0.23 | 3.6 | 35.18 | 2.1 | 6,900 | 35.93 | 16 | – |
| 0.25 to <0.50 | 11,684 | 13,646 | 31.04 | 15,760 | 0.39 | 3.2 | 29.68 | 2.1 | 6,340 | 40.23 | 18 | – |
| 0.50 to <0.75 | 9,052 | 10,313 | 29.59 | 11,474 | 0.64 | 2.7 | 30.35 | 2.3 | 5,895 | 51.38 | 22 | – |
| 0.75 to <2.50 | 16,509 | 22,118 | 30.51 | 21,274 | 1.46 | 3.6 | 24.76 | 3.0 | 12,974 | 60.98 | 75 | – |
| 2.50 to <10.00 | 10,711 | 25,470 | 32.83 | 15,775 | 4.74 | 2.0 | 23.17 | 3.2 | 13,198 | 83.66 | 171 | – |
| 10.00 to <100.00 | 1,357 | 2,216 | 42.54 | 1,865 | 18.67 | 0.4 | 16.45 | 2.0 | 1,630 | 87.39 | 61 | – |
| 100.00 (Default) | 4,887 | 1,928 | 24.99 | 5,071 | 100.00 | 1.0 | 30.68 | 2.8 | 1,226 | 24.17 | 1,461 | – |
| Sub-total | 122,749 | 217,541 | 29.64 | 182,833 | 3.68 | 29.7 | 29.99 | 2.3 | 65,270 | 35.70 | 1,851 | 2,203 |
| Dilution risk | 2,967 | 331 | 29.37 | 3,193 | 15.85 | 0.3 | 3.88 | 1.0 | 610 | 19.11 | 20 | 0 |
| Sub-total incl. dilution risk | 125,716 | 217,872 | 29.64 | 186,026 | 3.89 | 30.0 | 29.54 | 2.2 | 65,881 | 35.41 | 1,871 | 2,203 |

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| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|---|----------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|---------------|----------------------|------------------|---|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Retail | | | | | | | | | | | | |
| 0.00 to <0.15 | 26,952 | 16,300 | 55.50 | 36,679 | 0.09 | 2,769.3 | 15.77 | 10.6 | 1,450 | 3.95 | 9 | – |
| 0.15 to <0.25 | 31,506 | 6,271 | 67.56 | 35,911 | 0.22 | 1,328.5 | 15.79 | 6.9 | 2,657 | 7.40 | 15 | – |
| 0.25 to <0.50 | 35,405 | 4,084 | 62.87 | 38,165 | 0.38 | 883.1 | 16.83 | 8.1 | 4,364 | 11.43 | 26 | – |
| 0.50 to <0.75 | 35,170 | 3,492 | 65.71 | 37,555 | 0.67 | 922.1 | 18.31 | 7.6 | 6,742 | 17.95 | 48 | – |
| 0.75 to <2.50 | 35,599 | 3,823 | 69.92 | 38,226 | 1.44 | 1,452.1 | 23.09 | 8.8 | 12,596 | 32.95 | 134 | – |
| 2.50 to <10.00 | 18,335 | 1,983 | 79.50 | 19,678 | 4.49 | 851.2 | 26.84 | 6.7 | 11,024 | 56.02 | 241 | – |
| 10.00 to <100.00 | 4,111 | 195 | 68.76 | 4,125 | 20.18 | 193.0 | 28.07 | 6.4 | 4,030 | 97.69 | 241 | – |
| 100.00 (Default) | 4,205 | 63 | 57.77 | 4,229 | 100.02 | 161.9 | 45.05 | 4.8 | 720 | 17.04 | 1,795 | – |
| Sub-total | 191,284 | 36,210 | 62.37 | 214,569 | 3.26 | 8,561.2 | 19.54 | 8.1 | 43,584 | 20.31 | 2,509 | 2,690 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 191,284 | 36,210 | 62.37 | 214,569 | 3.26 | 8,561.2 | 19.54 | 8.1 | 43,584 | 20.31 | 2,509 | 2,690 |
| of which: | | | | | | | | | | | | |
| Secured by real estate property SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,149 | 135 | 59.57 | 1,229 | 0.12 | 6.8 | 11.51 | 14.4 | 36 | 2.91 | 0 | – |
| 0.15 to <0.25 | 1,577 | 120 | 59.33 | 1,644 | 0.23 | 7.8 | 10.93 | 15.1 | 74 | 4.49 | 0 | – |
| 0.25 to <0.50 | 1,864 | 107 | 56.00 | 1,914 | 0.39 | 8.9 | 11.37 | 15.8 | 130 | 6.82 | 1 | – |
| 0.50 to <0.75 | 1,559 | 88 | 52.13 | 1,591 | 0.64 | 7.7 | 11.37 | 15.4 | 153 | 9.65 | 1 | – |
| 0.75 to <2.50 | 1,986 | 103 | 54.37 | 2,019 | 1.35 | 9.9 | 11.49 | 15.8 | 320 | 15.84 | 3 | – |
| 2.50 to <10.00 | 906 | 26 | 49.65 | 903 | 4.41 | 4.5 | 11.46 | 14.9 | 277 | 30.67 | 4 | – |
| 10.00 to <100.00 | 180 | 3 | 43.85 | 175 | 20.75 | 1.1 | 12.44 | 14.2 | 105 | 60.16 | 4 | – |
| 100.00 (Default) | 100 | 0 | 49.33 | 99 | 100.00 | 0.4 | 26.13 | 10.7 | 16 | 15.83 | 26 | – |
| Sub-total | 9,321 | 583 | 56.29 | 9,573 | 2.36 | 47.1 | 11.52 | 15.3 | 1,111 | 11.60 | 40 | 48 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 9,321 | 583 | 56.29 | 9,573 | 2.36 | 47.1 | 11.52 | 15.3 | 1,111 | 11.60 | 40 | 48 |
| Secured by real estate property non-SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 23,505 | 598 | 65.79 | 23,884 | 0.10 | 262.4 | 13.93 | 14.9 | 828 | 3.47 | 3 | – |
| 0.15 to <0.25 | 27,629 | 1,210 | 84.04 | 28,625 | 0.22 | 250.4 | 14.36 | 7.3 | 1,872 | 6.54 | 9 | – |
| 0.25 to <0.50 | 30,649 | 1,395 | 80.28 | 31,743 | 0.38 | 256.2 | 14.39 | 8.2 | 3,187 | 10.04 | 18 | – |
| 0.50 to <0.75 | 29,921 | 1,568 | 82.00 | 31,175 | 0.67 | 235.7 | 15.24 | 7.9 | 4,913 | 15.76 | 32 | – |
| 0.75 to <2.50 | 24,112 | 2,101 | 86.36 | 25,877 | 1.42 | 203.6 | 14.19 | 10.3 | 6,233 | 24.09 | 52 | – |
| 2.50 to <10.00 | 10,132 | 1,285 | 94.99 | 11,332 | 4.53 | 95.1 | 13.50 | 8.3 | 5,098 | 44.99 | 71 | – |
| 10.00 to <100.00 | 2,338 | 83 | 92.69 | 2,397 | 20.19 | 19.3 | 15.48 | 8.5 | 2,157 | 89.97 | 76 | – |
| 100.00 (Default) | 1,662 | 18 | 83.14 | 1,676 | 100.04 | 15.0 | 21.40 | 6.2 | 223 | 13.28 | 358 | – |
| Sub-total | 149,947 | 8,258 | 84.08 | 156,708 | 2.21 | 1,337.6 | 14.48 | 9.3 | 24,511 | 15.64 | 619 | 625 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 149,947 | 8,258 | 84.08 | 156,708 | 2.21 | 1,337.6 | 14.48 | 9.3 | 24,511 | 15.64 | 619 | 625 |

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| in € m. (unless stated otherwise) | a | b | c | d | e | f | g | h | i | j | k | l |
|--------------------------------------|----------------|---------------------|--|--------------------------------|-------------------|--------------------------------|--------------------|-----------------------------|----------------|-------------------|---------------|----------------------------------|
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Qualifying Revolving | | | | | | | | | | | | |
| 0.00 to <0.15 | 46 | 10,311 | 70.57 | 7,319 | 0.07 | 2,252.3 | 10.94 | 0.0 | 213 | 2.91 | 4 | – |
| 0.15 to <0.25 | 100 | 3,267 | 72.28 | 2,460 | 0.19 | 876.8 | 5.81 | 0.0 | 168 | 6.82 | 3 | – |
| 0.25 to <0.50 | 143 | 1,035 | 67.90 | 846 | 0.38 | 414.6 | 14.52 | 0.0 | 92 | 10.85 | 2 | – |
| 0.50 to <0.75 | 176 | 673 | 64.81 | 612 | 0.67 | 433.3 | 17.76 | 0.0 | 110 | 18.02 | 3 | – |
| 0.75 to <2.50 | 287 | 553 | 63.97 | 640 | 1.48 | 466.8 | 21.52 | 0.0 | 195 | 30.44 | 5 | – |
| 2.50 to <10.00 | 196 | 195 | 64.77 | 322 | 4.67 | 252.7 | 21.84 | 0.0 | 222 | 68.79 | 9 | – |
| 10.00 to <100.00 | 54 | 19 | 65.58 | 67 | 19.69 | 52.5 | 23.03 | 0.0 | 97 | 145.31 | 7 | – |
| 100.00 (Default) | 63 | 2 | 62.74 | 64 | 100.03 | 30.7 | 59.90 | 0.0 | 43 | 67.71 | 38 | – |
| Sub-total | 1,064 | 16,054 | 70.20 | 12,330 | 0.96 | 4,779.8 | 11.65 | 0.0 | 1,139 | 9.24 | 70 | 82 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 1,064 | 16,054 | 70.20 | 12,330 | 0.96 | 4,779.8 | 11.65 | 0.0 | 1,139 | 9.24 | 70 | 82 |
| Other retail SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 423 | 2,455 | 16.70 | 1,072 | 0.11 | 33.4 | 43.48 | 3.8 | 102 | 9.51 | 1 | – |
| 0.15 to <0.25 | 412 | 870 | 30.68 | 824 | 0.23 | 35.3 | 43.00 | 4.1 | 131 | 15.95 | 1 | – |
| 0.25 to <0.50 | 569 | 795 | 24.84 | 936 | 0.39 | 34.2 | 47.94 | 3.7 | 235 | 25.08 | 2 | – |
| 0.50 to <0.75 | 622 | 587 | 25.94 | 885 | 0.64 | 25.6 | 53.36 | 3.2 | 322 | 36.42 | 3 | – |
| 0.75 to <2.50 | 982 | 554 | 32.01 | 1,170 | 1.35 | 24.9 | 54.05 | 3.4 | 590 | 50.43 | 9 | – |
| 2.50 to <10.00 | 736 | 276 | 34.55 | 669 | 4.47 | 14.6 | 55.47 | 3.3 | 442 | 66.12 | 17 | – |
| 10.00 to <100.00 | 200 | 48 | 31.98 | 136 | 24.87 | 4.4 | 57.20 | 3.0 | 130 | 96.04 | 20 | – |
| 100.00 (Default) | 260 | 14 | 38.64 | 259 | 100.00 | 3.4 | 63.37 | 2.9 | 73 | 28.07 | 164 | – |
| Sub-total | 4,204 | 5,599 | 23.74 | 5,950 | 5.90 | 175.8 | 50.19 | 3.5 | 2,026 | 34.04 | 215 | 225 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 4,204 | 5,599 | 23.74 | 5,950 | 5.90 | 175.8 | 50.19 | 3.5 | 2,026 | 34.04 | 215 | 225 |
| Other retail non-SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,829 | 2,801 | 32.61 | 3,175 | 0.09 | 399.2 | 33.03 | 3.4 | 271 | 8.53 | 1 | – |
| 0.15 to <0.25 | 1,789 | 805 | 64.83 | 2,358 | 0.22 | 238.3 | 37.41 | 4.2 | 412 | 17.49 | 2 | – |
| 0.25 to <0.50 | 2,180 | 752 | 65.00 | 2,726 | 0.39 | 250.9 | 39.08 | 5.1 | 719 | 26.39 | 4 | – |
| 0.50 to <0.75 | 2,892 | 576 | 64.38 | 3,293 | 0.66 | 296.7 | 41.43 | 4.4 | 1,243 | 37.73 | 9 | – |
| 0.75 to <2.50 | 8,232 | 512 | 49.81 | 8,521 | 1.53 | 846.1 | 48.73 | 3.8 | 5,260 | 61.73 | 64 | – |
| 2.50 to <10.00 | 6,366 | 201 | 49.35 | 6,452 | 4.42 | 532.7 | 49.72 | 3.4 | 4,985 | 77.27 | 141 | – |
| 10.00 to <100.00 | 1,339 | 40 | 53.49 | 1,351 | 19.65 | 127.0 | 49.76 | 2.3 | 1,541 | 114.05 | 133 | – |
| 100.00 (Default) | 2,120 | 29 | 48.97 | 2,131 | 100.00 | 120.8 | 61.86 | 3.7 | 366 | 17.19 | 1,210 | – |
| Sub-total | 26,748 | 5,716 | 47.01 | 30,006 | 9.50 | 2,811.7 | 45.69 | 3.8 | 14,797 | 49.31 | 1,564 | 1,710 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 26,748 | 5,716 | 47.01 | 30,006 | 9.50 | 2,811.7 | 45.69 | 3.8 | 14,797 | 49.31 | 1,564 | 1,710 |
| All exposure classes | | | | | | | | | | | | |
| Dilution risk | 3,183 | 333 | 29.76 | 3,368 | 15.85 | 0.3 | 3.89 | 1.0 | 644 | 19.12 | 21 | 0 |
| Total incl. dilution risk | 498,915 | 272,647 | 35.17 | 597,295 | 3.30 | 5,710.7 | 29.66 | 4.6 | 133,138 | 22.29 | 5,130 | 6,334 |

The credit risk exposures in our advanced IRB portfolio were at € 133.1 billion as of June 30, 2018, compared to € 126.9 billion as of December 31, 2017. The increase of € 6.2 billion is mainly driven by our portfolio in the exposure class corporates and retail showing the increase in business volumes in our CIB and PCB segments.

Article 452 (d-g) CRR - Foundation IRB exposure

The following series of tables details the Group's foundation IRB exposure distributed on our internal rating scale, separately for all relevant regulatory exposure classes. They exclude the counterparty credit risk position from derivatives and securities financing transactions which are presented separately in the section "Counterparty credit risk" in this report from page 122 to 137.

The tables show the EAD gross as well as the off-balance sheet exposure. All undrawn commitment exposure values shown below are assigned to the exposure class of their original counterparty and not to the exposure class of the protection seller.

In addition they provide the EAD net after CRM, where exposures covered by guarantees or credit derivatives is assigned to the protection seller. As a consequence the EAD net can be higher than the original balance sheet exposure.

The EAD net is presented in conjunction with exposures-weighted average PD, maturity as well as the RWA and the average risk weight (RW). In addition it provides the average LGD and average maturity, which is regulatory pre-defined in the foundation IRB. Further details in the tables are number of obligors, expected loss and provisions.

EU CR6 – FIRB approach – Credit risk exposures by exposure class and PD range

| Dec 31, 2018 | | | | | | | | | | | | |
|--|--------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|--------------|----------------------|------------------|---|
| in € m. (unless stated otherwise) | | | | | | | | | | | | |
| | a | b | c | d | e | f | g | h | i | j | k | l |
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| Central governments and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | 17 | 4 | 0 | 17 | 0 | <0.1 | 12.33 | 2.5 | 0 | 0 | 0 | – |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| Sub-total | 17 | 4 | 0 | 17 | 0 | <0.1 | 12.33 | 2.5 | 0 | 0 | 0 | 0 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 17 | 4 | 0 | 17 | 0 | <0.1 | 12.33 | 2.5 | 0 | 0 | 0 | 0 |
| Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 1 | 5 | 0 | 1 | 0.08 | <0.1 | 12.79 | 2.5 | 0 | 12.43 | 0 | – |
| 0.15 to <0.25 | 0 | 1 | 0 | 0 | 0.21 | <0.1 | 42.69 | 2.5 | 0 | 44.48 | 0 | – |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0.38 | <0.1 | 42.69 | 2.5 | 0 | 61.52 | 0 | – |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0.69 | <0.1 | 42.69 | 2.5 | 0 | 80.47 | 0 | – |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 15 | 0 | 0 | 15 | 20.00 | <0.1 | 45.00 | 2.5 | 39 | 252.53 | 1 | – |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| Sub-total | 16 | 6 | 0 | 16 | 19.13 | <0.1 | 43.62 | 2.5 | 39 | 242.02 | 1 | 0 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 16 | 6 | 0 | 16 | 19.13 | <0.1 | 43.62 | 2.5 | 39 | 242.02 | 1 | 0 |
| Corporates | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,930 | 1,295 | 0 | 1,931 | 0.07 | 6.2 | 15.91 | 2.5 | 244 | 12.65 | 0 | – |
| 0.15 to <0.25 | 1,394 | 1,113 | 74.35 | 1,518 | 0.21 | 2.1 | 38.32 | 2.5 | 631 | 41.57 | 1 | – |
| 0.25 to <0.50 | 896 | 1,079 | 74.98 | 955 | 0.38 | 2.4 | 32.44 | 2.5 | 470 | 49.26 | 1 | – |
| 0.50 to <0.75 | 481 | 477 | 75.00 | 485 | 0.67 | 1.5 | 28.50 | 2.5 | 278 | 57.34 | 1 | – |
| 0.75 to <2.50 | 286 | 321 | 100.00 | 286 | 1.53 | 0.7 | 18.88 | 2.5 | 158 | 55.31 | 1 | – |
| 2.50 to <10.00 | 92 | 63 | 75.00 | 95 | 5.08 | 0.1 | 22.05 | 2.5 | 86 | 90.75 | 1 | – |
| 10.00 to <100.00 | 52 | 42 | 73.37 | 55 | 17.70 | 0.1 | 31.91 | 2.5 | 103 | 186.56 | 3 | – |
| 100.00 (Default) | 68 | 8 | 100.00 | 68 | 100.00 | 0.1 | 41.69 | 2.5 | 0 | 0 | 28 | – |
| Sub-total | 5,200 | 4,399 | 73.37 | 5,394 | 17.70 | 13.0 | 31.91 | 2.5 | 1,972 | 36.55 | 37 | 51 |
| Dilution risk | 3,590 | 7,294 | 6.52 | 3,824 | 0.15 | 49.3 | 59.69 | 1.0 | 655 | 17.12 | 3 | 0 |
| Sub-total incl. dilution risk | 8,790 | 11,693 | 31.67 | 9,218 | 10.42 | 62.3 | 43.43 | 1.9 | 2,626 | 28.49 | 40 | 51 |

| Dec 31, 2018 | | | | | | | | | | | | |
|--------------------------------------|--------------|---------------------|--|--------------------------------|-------------------|--------------------------------|--------------------|-----------------------------|--------------|-------------------|---------------|----------------------------------|
| in € m. (unless stated otherwise) | | | | | | | | | | | | |
| | a | b | c | d | e | f | g | h | i | j | k | l |
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions |
| of which: | | | | | | | | | | | | |
| SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.15 to <0.25 | 1 | 3 | 0 | 1 | 0.19 | <0.1 | 12.33 | 2.5 | 0 | 8.85 | 0 | – |
| 0.25 to <0.50 | 6 | 7 | 75.00 | 7 | 0.38 | <0.1 | 39.42 | 2.5 | 3 | 44.82 | 0 | – |
| 0.50 to <0.75 | 5 | 5 | 75.00 | 7 | 0.69 | <0.1 | 42.73 | 2.5 | 4 | 55.60 | 0 | – |
| 0.75 to <2.50 | 3 | 1 | 0 | 3 | 1.23 | <0.1 | 39.59 | 2.5 | 3 | 83.68 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 1 | 1 | 0 | 1 | 19.82 | <0.1 | 43.51 | 2.5 | 1 | 159.24 | 0 | – |
| 100.00 (Default) | 1 | 0 | 0 | 1 | 100.00 | <0.1 | 45.00 | 2.5 | 0 | 0 | 0 | – |
| Sub-total | 17 | 15 | 75.00 | 19 | 6.61 | 0.1 | 39.78 | 2.5 | 11 | 55.83 | 1 | 1 |
| Dilution risk | 260 | 2,413 | 7.26 | 434 | 0.18 | 37.9 | 59.69 | 1.0 | 61 | 14.01 | 0 | 0 |
| Sub-total incl. dilution risk | 277 | 2,428 | 7.68 | 454 | 0.46 | 38.0 | 58.84 | 1.1 | 72 | 15.79 | 1 | 1 |
| Specialized Lending | | | | | | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,930 | 1,295 | 0 | 1,931 | 0.07 | 6.2 | 15.91 | 2.5 | 244 | 12.65 | 0 | – |
| 0.15 to <0.25 | 1,393 | 1,111 | 74.35 | 1,517 | 0.21 | 2.1 | 38.33 | 2.5 | 631 | 41.59 | 1 | – |
| 0.25 to <0.50 | 890 | 1,072 | 74.98 | 948 | 0.38 | 2.3 | 32.39 | 2.5 | 467 | 49.29 | 1 | – |
| 0.50 to <0.75 | 477 | 472 | 75.00 | 478 | 0.67 | 1.5 | 28.30 | 2.5 | 274 | 57.37 | 1 | – |
| 0.75 to <2.50 | 283 | 321 | 100.00 | 283 | 1.54 | 0.6 | 18.65 | 2.5 | 156 | 55.00 | 1 | – |
| 2.50 to <10.00 | 92 | 63 | 75.00 | 95 | 5.08 | 0.1 | 22.05 | 2.5 | 86 | 90.75 | 1 | – |
| 10.00 to <100.00 | 51 | 41 | 73.37 | 54 | 17.67 | 0.1 | 31.73 | 2.5 | 102 | 186.98 | 3 | – |
| 100.00 (Default) | 67 | 8 | 100.00 | 67 | 100.00 | 0.1 | 41.64 | 2.5 | 0 | 0 | 28 | – |
| Sub-total | 5,183 | 4,383 | 75.00 | 5,375 | 0.67 | 13.0 | 28.30 | 2.5 | 1,961 | 36.48 | 36 | 50 |
| Dilution risk | 3,330 | 4,881 | 5.04 | 3,390 | 0.14 | 11.4 | 59.69 | 1.0 | 594 | 17.52 | 3 | 0 |
| Sub-total incl. dilution risk | 8,513 | 9,264 | 38.14 | 8,764 | 0.47 | 24.3 | 40.44 | 1.9 | 2,555 | 29.15 | 39 | 50 |
| All exposure classes | | | | | | | | | | | | |
| Dilution risk | 3,590 | 7,294 | 6.52 | 3,824 | 0.15 | 49.3 | 59.69 | 1.0 | 655 | 17.12 | 3 | 0 |
| Total incl. dilution risk | 8,823 | 11,703 | 11.11 | 9,251 | 1.16 | 62.4 | 40.53 | 1.9 | 2,665 | 28.81 | 42 | 51 |

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|--|--------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|--------------|----------------------|------------------|--|
| in € m. (unless stated otherwise) | | | | | | | | | | | | |
| | a | b | c | d | e | f | g | h | i | j | k | l |
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions ¹ |
| Central governments and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | 12 | 10 | 0 | 12 | 0 | <0.1 | 12.33 | 2.5 | 0 | 0 | 0 | – |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0.39 | <0.1 | 12.33 | 2.5 | 0 | 26.89 | 0 | – |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| Sub-total | 12 | 10 | 0 | 12 | 0.00 | <0.1 | 12.33 | 2.5 | 0 | 0.02 | 0 | 0 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 12 | 10 | 0 | 12 | 0.00 | <0.1 | 12.33 | 2.5 | 0 | 0.02 | 0 | 0 |
| Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 1 | 3 | 0 | 1 | 0.07 | <0.1 | 13.97 | 2.5 | 0 | 15.64 | 0 | – |
| 0.15 to <0.25 | 0 | 1 | 0 | 0 | 0.21 | <0.1 | 42.69 | 2.5 | 0 | 45.55 | 0 | – |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0.38 | <0.1 | 42.69 | 2.5 | 0 | 61.52 | 0 | – |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 1 | 1 | 0 | 1 | 20.00 | <0.1 | 45.00 | 2.5 | 3 | 253.92 | 0 | – |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| Sub-total | 2 | 5 | 0 | 2 | 12.15 | <0.1 | 33.01 | 2.5 | 3 | 160.31 | 0 | 0 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 2 | 5 | 0 | 2 | 12.15 | <0.1 | 33.01 | 2.5 | 3 | 160.31 | 0 | 0 |
| Corporates | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,155 | 965 | 0 | 1,657 | 0.07 | 8.2 | 17.04 | 2.5 | 212 | 12.78 | 0 | – |
| 0.15 to <0.25 | 1,387 | 1,164 | 74.69 | 1,439 | 0.20 | 2.1 | 39.61 | 2.5 | 599 | 41.60 | 1 | – |
| 0.25 to <0.50 | 1,013 | 1,089 | 75.00 | 919 | 0.38 | 2.3 | 32.25 | 2.5 | 449 | 48.91 | 1 | – |
| 0.50 to <0.75 | 460 | 558 | 74.77 | 321 | 0.68 | 1.4 | 29.55 | 2.5 | 184 | 57.35 | 1 | – |
| 0.75 to <2.50 | 315 | 410 | 75.00 | 247 | 1.44 | 0.6 | 23.81 | 2.5 | 159 | 64.44 | 1 | – |
| 2.50 to <10.00 | 80 | 66 | 75.00 | 79 | 5.21 | 0.1 | 25.94 | 2.5 | 88 | 110.88 | 1 | – |
| 10.00 to <100.00 | 75 | 52 | 67.52 | 75 | 19.96 | 0.1 | 40.67 | 2.5 | 180 | 241.47 | 6 | – |
| 100.00 (Default) | 74 | 14 | 75.00 | 78 | 100.00 | 0.1 | 42.01 | 2.5 | 0 | 0 | 33 | – |
| Sub-total | 4,560 | 4,318 | 74.76 | 4,815 | 2.29 | 14.9 | 28.79 | 2.5 | 1,871 | 38.86 | 44 | 57 |
| Dilution risk | 3,212 | 7,382 | 6.04 | 3,433 | 0.26 | 50.7 | 59.69 | 1.0 | 551 | 16.04 | 5 | 0 |
| Sub-total incl. dilution risk | 7,772 | 11,700 | 46.16 | 8,248 | 1.45 | 65.6 | 41.65 | 1.9 | 2,422 | 29.36 | 49 | 57 |

of which:

| Jun 30, 2018 | | | | | | | | | | | | |
|--------------------------------------|--------------|------------------------|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|-----------------------------------|--------------|----------------------|------------------|--|
| in € m. (unless stated otherwise) | | | | | | | | | | | | |
| | a | b | c | d | e | f | g | h | i | j | k | l |
| Exposure class/ PD scale | EAD gross | Undrawn commitments | Weighted Credit Conversion Factor (CCF) (in %) | EAD net, post CRM and post-CCF | Average PD (in %) | Number of obligors (in 1,000s) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) | Expected Loss | Value adjustments and Provisions ¹ |
| SMEs | | | | | | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.15 to <0.25 | 18 | 20 | 0 | 16 | 0.23 | <0.1 | 43.21 | 2.5 | 7 | 41.08 | 0 | – |
| 0.25 to <0.50 | 18 | 16 | 75.00 | 17 | 0.38 | <0.1 | 26.71 | 2.5 | 5 | 29.38 | 0 | – |
| 0.50 to <0.75 | 3 | 4 | 0 | 3 | 0.69 | <0.1 | 29.76 | 2.5 | 1 | 41.44 | 0 | – |
| 0.75 to <2.50 | 1 | 0 | 0 | 0 | 1.68 | <0.1 | 29.21 | 2.5 | 0 | 48.92 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 7.26 | <0.1 | 12.33 | 2.5 | 0 | 33.66 | 0 | – |
| 10.00 to <100.00 | 0 | 2 | 0 | 0 | 12.78 | <0.1 | 12.43 | 2.5 | 0 | 40.73 | 0 | – |
| 100.00 (Default) | 1 | 0 | 75.00 | 1 | 100.00 | <0.1 | 45.00 | 2.5 | 0 | 0 | 1 | – |
| Sub-total | 40 | 42 | 75.00 | 38 | 3.83 | 0.1 | 34.56 | 2.5 | 13 | 34.43 | 1 | 1 |
| Dilution risk | 299 | 2,492 | 6.62 | 462 | 0.42 | 38.2 | 59.69 | 1.0 | 63 | 13.71 | 1 | 0 |
| Sub-total incl. dilution risk | 339 | 2,535 | 11.76 | 500 | 0.68 | 38.3 | 57.80 | 1.1 | 76 | 15.27 | 2 | 1 |
| Specialized Lending | | | | | | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | – |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total incl. dilution risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | | | | | | | | | | | | |
| 0.00 to <0.15 | 1,155 | 965 | 0 | 1,657 | 0.07 | 8.2 | 17.04 | 2.5 | 212 | 12.78 | 0 | – |
| 0.15 to <0.25 | 1,370 | 1,144 | 74.69 | 1,423 | 0.20 | 2.1 | 39.57 | 2.5 | 592 | 41.61 | 1 | – |
| 0.25 to <0.50 | 995 | 1,073 | 75.00 | 902 | 0.38 | 2.3 | 32.36 | 2.5 | 444 | 49.29 | 1 | – |
| 0.50 to <0.75 | 457 | 554 | 74.77 | 319 | 0.68 | 1.4 | 29.55 | 2.5 | 183 | 57.48 | 1 | – |
| 0.75 to <2.50 | 315 | 410 | 75.00 | 246 | 1.44 | 0.6 | 23.79 | 2.5 | 159 | 64.47 | 1 | – |
| 2.50 to <10.00 | 80 | 66 | 75.00 | 79 | 5.21 | 0.1 | 25.94 | 2.5 | 88 | 110.88 | 1 | – |
| 10.00 to <100.00 | 75 | 50 | 67.52 | 75 | 19.96 | 0.1 | 40.69 | 2.5 | 180 | 241.57 | 6 | – |
| 100.00 (Default) | 73 | 13 | 75.00 | 77 | 100.00 | 0.1 | 41.96 | 2.5 | 0 | 0 | 32 | – |
| Sub-total | 4,520 | 4,276 | 74.76 | 4,777 | 2.28 | 14.8 | 28.74 | 2.5 | 1,858 | 38.90 | 43 | 57 |
| Dilution risk | 2,913 | 4,889 | 4.85 | 2,971 | 0.23 | 12.5 | 59.69 | 1.0 | 487 | 16.40 | 4 | 0 |
| Sub-total incl. dilution risk | 7,433 | 9,165 | 47.96 | 7,749 | 1.50 | 27.3 | 40.61 | 1.9 | 2,346 | 30.27 | 47 | 57 |
| All exposure classes | | | | | | | | | | | | |
| Dilution risk | 3,212 | 7,382 | 6.04 | 3,433 | 0.26 | 50.7 | 59.69 | 1.0 | 551 | 16.04 | 5 | 0 |
| Total incl. dilution risk | 7,787 | 11,715 | 46.21 | 8,262 | 1.45 | 65.6 | 41.61 | 1.9 | 2,425 | 29.35 | 49 | 57 |

¹ Figures of value adjustments and provisions adjusted.

Article 453 (g) CRR - Total IRB exposure covered by credit derivatives

The table below presents our IRB exposure – split into A-IRB and F-IRB – which is covered by credit derivatives. It shows the RWA by the relevant exposures classes prior to credit risk mitigation as well as after recognition of credit derivatives where the exposure is then assigned to the exposure class of the protection seller. As a consequence the RWA after credit risk mitigation in a specific exposure class can be higher than before its recognition.

EU CR7 – IRB approach – Effect on the RWAs of credit derivatives used as CRM techniques

| in € m. | Dec 31, 2018 | | Jun 30, 2018 ¹ | |
|---|----------------------------|----------------|----------------------------|----------------|
| | a | b | a | b |
| | pre-credit derivatives RWA | Actual RWA | pre-credit derivatives RWA | Actual RWA |
| 7 Exposures under AIRB | | | | |
| 8 Central governments and central banks | 15,579 | 15,579 | 14,853 | 14,853 |
| 9 Institutions | 4,479 | 4,550 | 4,582 | 4,664 |
| 9a Corporates | 81,570 | 80,441 | 81,692 | 80,241 |
| of which: | | | | |
| 10 SMEs | 5,278 | 5,278 | 6,063 | 6,063 |
| 11 Specialized lending | 7,842 | 7,842 | 8,296 | 8,296 |
| 12 Other | 68,450 | 67,321 | 67,332 | 65,881 |
| 12a Retail | 43,477 | 43,477 | 43,584 | 43,584 |
| of which: | | | | |
| 13 Secured by real estate property SMEs | 1,017 | 1,017 | 1,111 | 1,111 |
| 14 Secured by real estate property non-SMEs | 24,073 | 24,073 | 24,511 | 24,511 |
| 15 Qualifying revolving | 1,126 | 1,126 | 1,139 | 1,139 |
| 16 Other retail SMEs | 1,887 | 1,887 | 2,026 | 2,026 |
| 17 Other retail non-SMEs | 15,375 | 15,375 | 14,797 | 14,797 |
| 18 Equity | 9,170 | 9,170 | 8,315 | 8,315 |
| 19 Other non-credit obligation asset | 3,276 | 3,276 | 4,511 | 4,511 |
| 19a Sub-total AIRB | 157,551 | 156,494 | 157,536 | 156,167 |
| 1 Exposures under FIRB | | | | |
| 2 Central governments and central banks | 0 | 0 | 0 | 0 |
| 3 Institutions | 39 | 39 | 3 | 3 |
| 3a Corporates | 3,670 | 3,670 | 3,487 | 3,487 |
| of which: | | | | |
| 4 SMEs | 72 | 72 | 76 | 76 |
| 5 Specialized lending | 1,044 | 1,044 | 1,066 | 1,066 |
| 6 Other | 2,555 | 2,555 | 2,346 | 2,346 |
| 6a Sub-total FIRB | 3,709 | 3,709 | 3,491 | 3,491 |
| 20 Total | 161,260 | 160,203 | 161,027 | 159,657 |

¹ Total exposures have been restated to properly reflect the sum across all exposure classes.

Article 438 (d) CRR - Development of credit risk RWA

The following table provides an analysis of key drivers for RWA movements observed for credit risk, excluding counterparty credit risk, to the extent covered in IRB approaches in the current and previous reporting period. It also shows the corresponding movements in capital requirements, derived from the RWA by an 8 % capital ratio.

EU CR8 – RWA flow statement of credit risk exposures under the IRB approach

| in € m. | Three months ended Dec 31, 2018 | | Three months ended Sep 30, 2018 | |
|--|---------------------------------|----------------------|---------------------------------|----------------------|
| | a | b | a | b |
| | RWA | Capital requirements | RWA | Capital requirements |
| 1 Credit risk RWA opening balance | 138,009 | 11,041 | 141,140 | 11,291 |
| 2 Book size | 4,275 | 342 | (1,573) | (126) |
| 3 Book quality | (1,613) | (129) | (995) | (80) |
| 4 Model updates | (63) | (5) | (399) | (32) |
| 5 Methodology and policy | 0 | 0 | 0 | 0 |
| 6 Acquisitions and disposals | (1,653) | (132) | 0 | 0 |
| 7 Foreign exchange movements | 945 | 76 | (164) | (13) |
| 8 Other | 0 | 0 | 0 | 0 |
| 9 Credit risk RWA closing balance | 139,901 | 11,192 | 138,009 | 11,041 |

Organic changes in our portfolio size and composition are considered in the category “Book size”. The category “Book quality” mainly represents the effects from portfolio rating migrations, loss given default, model parameter recalibrations as well as collateral coverage and netting activities. “Model updates” include model refinements and advanced model roll out. RWA

movements resulting from externally, regulatory-driven changes, e.g. applying new regulations, are considered in the “Methodology and policy” section. “Acquisition and disposals” is reserved to show significant exposure movements which can be clearly assigned to new businesses or disposal-related activities. Changes that cannot be attributed to the above categories are reflected in the category “Other”.

The increase in RWA for credit risk exposures under the IRB approach by 1.4 % or € 1.9 billion since September 30, 2018 is primarily driven by the increase in the category “Book size” representing business growth mainly in our Corporate & Investment Bank. Furthermore the category “Foreign exchange movements” drove the overall increase. This was partly offset by the categories “Book quality” and “Acquisition and disposals”, the latter driven by the partial disposal of our Poland retail business. The reduction in the category “Book quality” is related to several favorable risk parameter developments.

Article 452 (h-i) CRR - Model validation results and expected versus actual losses

Advanced IRBA – Model validation results

The validation reviews conducted in 2018 for advanced IRBA rating systems (including IRBA rating systems used in DB PFK AG for ex Postbank portfolios) triggered recalibrations as shown in the table below. None of the triggered recalibrations individually nor the impact of all recalibrations in the aggregate impacted or are indicated to impact our regulatory capital requirements materially in a progressive way.

Validation results for risk parameters used in our advanced IRBA

| | 2018 | | | | | |
|---------------------|------------|--------------|------------|--------------|-----------|--------------|
| | PD | | LGD | | EAD | |
| | Count | EAD in % | Count | EAD in % | Count | EAD in % |
| Appropriate | 94 | 85.2 | 130 | 83.2 | 70 | 78.7 |
| Overly conservative | 12 | 12.1 | 34 | 13.7 | 8 | 20.8 |
| Progressive | 14 | 2.7 | 22 | 3.2 | 7 | 0.6 |
| Total | 120 | 100.0 | 186 | 100.0 | 85 | 100.0 |

Of which already recalibrated and introduced in 2018

| | Count | EAD in % | Count | EAD in % | Count | EAD in % |
|---------------------|----------|------------|-----------|------------|----------|------------|
| Overly conservative | 2 | 0.3 | 11 | 1.9 | 0 | 0.0 |
| Progressive | 0 | 0.0 | 3 | 0.3 | 0 | 0.0 |
| Total | 2 | 0.3 | 14 | 2.2 | 0 | 0.0 |

| | 2017 | | | | | |
|---------------------|------------|--------------|------------|--------------|-----------|--------------|
| | PD | | LGD | | EAD | |
| | Count | EAD in % | Count | EAD in % | Count | EAD in % |
| Appropriate | 95 | 87.1 | 107 | 86.1 | 74 | 92.2 |
| Overly conservative | 10 | 7.5 | 34 | 3.9 | 7 | 2.6 |
| Progressive | 17 | 5.5 | 45 | 10.1 | 9 | 5.2 |
| Total | 122 | 100.0 | 186 | 100.0 | 90 | 100.0 |

Of which already recalibrated and introduced in 2017

| | Count | EAD in % | Count | EAD in % | Count | EAD in % |
|---------------------|----------|------------|----------|------------|----------|------------|
| Overly conservative | 0 | 0.0 | 3 | 1.2 | 0 | 0.0 |
| Progressive | 2 | 0.6 | 0 | 0.0 | 1 | 0.3 |
| Total | 2 | 0.6 | 3 | 1.2 | 1 | 0.3 |

Individual risk parameter settings are classified as appropriate if no recalibration was triggered by the validation and thus the application of the current parameter setting is continued since still sufficiently conservative. A parameter classifies as overly conservative or progressive if the validation triggers a recalibration analysis leading to a potential downward or upward change of the current setting, respectively. The breakdown for PD, LGD and EAD is presented by number as well as by the relative EAD attached to the respective parameter as of December 31, 2018 and December 31, 2017.

The validations during 2018 largely confirmed our parameter settings. Negatively validated PD parameters with high materiality were caused by three rating systems. For two rating systems which contributed to 8.9 % of EAD and for which the PD was classified as overly conservative, an overhaul was already performed and regulatory approval process started. For the third rating systems four PD parameters contributing to 2.4 % of EAD were classified as overly conservative and the overhaul was already performed in 2018 with targeted implementation in the first half of 2019. Validations furthermore classified one LGD parameters of Deutsche Bank contributing around 5.2 % of EAD as overly conservative. The recalibration was already performed and regulatory approval process started. Two LGD parameters of Deutsche Bank contributing around 5.0 % of EAD were classified as overly conservative and recalibration is scheduled for Q3 2019 pending regulatory approval. One EAD parameter contributing 20.1 % of EAD was classified as overly conservative and recalibration is scheduled for 2019. All other

negatively validated parameters are only applied to smaller portfolios. Overall, out of the 97 risk parameters, where a recalibration was triggered during 2018 validation, 16 were already amended in 2018.

For the remaining parameters (affecting various smaller portfolios) classified as either too progressive or overly conservative the recalibration process is ongoing.

The below table EU CR9 aims at providing backtesting information for probabilities of default ("PD"). It compares the PD used in the advanced IRB capital calculations with the effective obligors' default rates presented on a five year average by regulatory exposure classes. It has to be noted that the below table reflects credit risk as well as counterparty credit risk information simultaneously in line with our internal rating model validation practice where ratings are validated on a counterparty level across all exposure types. Moreover, some limitations have to be considered when comparing the below backtesting results with the above presented PD model validation results: Whilst in line with our internal procedures model validation is conducted on the level of the rating model and the model validation results provided above reflect this practice, for the below presentation by regulatory exposure classes the underlying ratings models have been assigned subsequently to the relevant regulatory exposure class. This different way of aggregation applied for the below backtesting information may result in some bias for the below backtesting results in contrast to the above model validation results.

EU CR9 IRB backtesting of PD per exposure class for Advanced IRBA

| | | Dec 31, 2018 | | | | | | |
|--|----------------------------------|-------------------------------------|--|--|-----------------------------------|--------------------------------------|--|--|
| a/b | c | d | e | f | | g | h | i |
| | | | | Number of obligors | | | | |
| Exposure class/ PD Range | External rating equivalent | Weighted average PD (in %) | Arithmetic average PD by obligors (in %) | End of previous year ¹ (in 1,000s) | End of the year (in 1,000s) | Defaulted obligors in the year | of which new obligors in the year | Average historical annual default rate (in %) |
| Central governments and central banks | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.01 | 0.03 | 0.3 | 0.3 | 0 | 0 | 0.00 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | <0.1 | <0.1 | 0 | 0 | 0.76 |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | <0.1 | <0.1 | 0 | 0 | 0.89 |
| 0.75 to <2.50 | BB+ to BB- | 1.61 | 1.43 | <0.1 | <0.1 | 0 | 0 | 1.03 |
| 2.50 to <10.00 | BB- to B- | 4.18 | 4.05 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| 10.00 to <100.00 | B- to CCC- | 13.00 | 13.82 | <0.1 | <0.1 | 1 | 0 | 7.55 |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| Sub-total | N/M | 0.13 | 3.03 | 0.4 | 0.4 | 1 | 0 | 0.40 |
| Institutions | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.05 | 0.07 | 0.8 | 0.7 | 0 | 0 | 0.00 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 0.1 | 0.1 | 1 | 0 | 0.19 |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.75 to <2.50 | BB+ to BB- | 1.56 | 1.44 | 0.1 | 0.1 | 0 | 0 | 0.58 |
| 2.50 to <10.00 | BB- to B- | 3.46 | 4.53 | <0.1 | <0.1 | 1 | 0 | 2.01 |
| 10.00 to <100.00 | B- to CCC- | 14.78 | 21.26 | <0.1 | <0.1 | 1 | 0 | 5.33 |
| 100.00 (Default) | CCC- to D | 100.00 | N/M | 0 | 0 | 0 | 0 | 0.00 |
| Sub-total | N/M | 0.80 | 1.27 | 1.2 | 1.1 | 3 | 0 | 0.30 |
| Corporates | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.06 | 0.07 | 28.6 | 27.4 | 7 | 0 | 0.03 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 6.1 | 6.1 | 5 | 0 | 0.08 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 6.2 | 5.9 | 20 | 1 | 0.25 |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.65 | 5.3 | 5.0 | 26 | 0 | 0.33 |
| 0.75 to <2.50 | BB+ to BB- | 1.45 | 1.39 | 7.6 | 6.7 | 457 | 391 | 0.74 |
| 2.50 to <10.00 | BB- to B- | 4.85 | 4.69 | 4.0 | 3.5 | 95 | 1 | 2.43 |
| 10.00 to <100.00 | B- to CCC- | 17.64 | 20.10 | 0.9 | 0.9 | 79 | 1 | 10.18 |
| 100.00 (Default) | CCC- to D | 100.00 | 99.99 | 0.1 | 0.1 | 27 | 25 | 23.39 |
| Sub-total | N/M | 3.43 | 3.11 | 58.9 | 55.6 | 716 | 419 | 0.48 |
| of which: | | | | | | | | |
| SMEs | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.09 | 0.08 | 5.4 | 5.7 | 1 | 0 | 0.07 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 2.1 | 2.0 | 3 | 0 | 0.19 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 2.1 | 2.1 | 8 | 0 | 0.37 |
| 0.50 to <0.75 | BBB- to BB+ | 0.65 | 0.65 | 1.8 | 1.8 | 8 | 0 | 0.62 |
| 0.75 to <2.50 | BB+ to BB- | 1.44 | 1.40 | 2.4 | 2.2 | 29 | 2 | 1.18 |
| 2.50 to <10.00 | BB- to B- | 4.73 | 4.56 | 1.3 | 1.0 | 53 | 1 | 3.27 |
| 10.00 to <100.00 | B- to CCC- | 20.64 | 21.25 | 0.3 | 0.2 | 34 | 0 | 9.78 |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 7 | 6 | 68.18 |
| Sub-total | N/M | 4.60 | 2.62 | 15.5 | 15.1 | 143 | 9 | 1.17 |
| Specialized lending¹ | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.09 | 0.09 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.22 | 0.1 | 0.1 | 0 | 0 | 0.33 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.50 to <0.75 | BBB- to BB+ | 0.66 | 0.67 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.75 to <2.50 | BB+ to BB- | 1.40 | 1.48 | 0.2 | 0.3 | 0 | 0 | 1.71 |
| 2.50 to <10.00 | BB- to B- | 5.39 | 5.04 | 0.4 | 0.3 | 10 | 0 | 7.32 |
| 10.00 to <100.00 | B- to CCC- | 16.85 | 20.02 | 0.2 | 0.2 | 9 | 0 | 17.07 |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| Sub-total | N/M | 13.98 | 15.93 | 1.1 | 1.2 | 19 | 0 | 2.53 |

| | | Dec 31, 2018 | | | | | | | |
|--|----------------------------------|-------------------------------------|--|--|-----------------------------------|--------------------------------------|--|--|---|
| a/b | c | d | e | f | | | g | h | i |
| | | Number of obligors | | | | | | | |
| Exposure class/ PD Range | External rating equivalent | Weighted average PD (in %) | Arithmetic average PD by obligors (in %) | End of previous year ¹ (in 1,000s) | End of the year (in 1,000s) | Defaulted obligors in the year | of which new obligors in the year | Average historical annual default rate (in %) | |
| Other | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.06 | 0.06 | 23.1 | 21.7 | 6 | 0 | 0.03 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 4.0 | 4.0 | 2 | 0 | 0.06 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 3.9 | 3.7 | 12 | 1 | 0.24 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | 3.4 | 3.2 | 17 | 0 | 0.30 | |
| 0.75 to <2.50 | BB+ to BB- | 1.46 | 1.37 | 5.0 | 4.2 | 426 | 389 | 0.64 | |
| 2.50 to <10.00 | BB- to B- | 4.62 | 4.70 | 2.4 | 2.2 | 32 | 0 | 2.02 | |
| 10.00 to <100.00 | B- to CCC- | 19.41 | 19.69 | 0.4 | 0.4 | 37 | 1 | 9.86 | |
| 100.00 (Default) | CCC- to D | 100.00 | 99.99 | 0.1 | 0.1 | 20 | 19 | 13.71 | |
| Sub-total | N/M | 2.28 | 2.91 | 42.3 | 39.4 | 552 | 410 | 0.38 | |
| Retail | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.10 | 0.08 | 1,383.0 | 1,362.9 | 570 | 38 | 0.04 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.22 | 660.3 | 627.0 | 897 | 114 | 0.11 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 657.2 | 603.0 | 1,704 | 189 | 0.21 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.67 | 0.67 | 748.7 | 624.4 | 3,044 | 271 | 0.35 | |
| 0.75 to <2.50 | BB+ to BB- | 1.46 | 1.50 | 1,298.8 | 1,178.6 | 13,474 | 2,581 | 0.95 | |
| 2.50 to <10.00 | BB- to B- | 4.55 | 4.57 | 632.8 | 669.1 | 21,254 | 2,611 | 2.76 | |
| 10.00 to <100.00 | B- to CCC- | 20.82 | 24.46 | 160.8 | 148.6 | 29,457 | 893 | 17.43 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 70.5 | 82.6 | 3,691 | 86 | 14.57 | |
| Sub-total | N/M | 3.24 | 4.20 | 5,612.2 | 5,296.3 | 74,091 | 6,783 | 1.26 | |
| of which: | | | | | | | | | |
| Secured by real estate property | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.10 | 0.10 | 250.2 | 196.6 | 101 | 2 | 0.06 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.22 | 262.6 | 248.6 | 155 | 0 | 0.11 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 266.2 | 258.1 | 316 | 0 | 0.18 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.67 | 0.67 | 244.1 | 236.4 | 456 | 2 | 0.26 | |
| 0.75 to <2.50 | BB+ to BB- | 1.43 | 1.43 | 228.0 | 199.7 | 780 | 11 | 0.40 | |
| 2.50 to <10.00 | BB- to B- | 4.56 | 4.48 | 106.3 | 90.2 | 1,027 | 10 | 1.44 | |
| 10.00 to <100.00 | B- to CCC- | 21.21 | 21.09 | 21.3 | 17.2 | 2,334 | 9 | 12.46 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 9.7 | 9.3 | 781 | 14 | 20.41 | |
| Sub-total | N/M | 2.26 | 2.22 | 1,388.4 | 1,256.2 | 5,950 | 48 | 0.60 | |
| Qualifying revolving | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.09 | 0.08 | 849.8 | 881.2 | 258 | 20 | 0.02 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.19 | 0.23 | 146.6 | 126.6 | 343 | 16 | 0.11 | |
| 0.25 to <0.50 | BBB to BBB- | 0.36 | 0.39 | 121.0 | 107.2 | 555 | 42 | 0.23 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.62 | 0.65 | 148.8 | 102.6 | 822 | 62 | 0.36 | |
| 0.75 to <2.50 | BB+ to BB- | 1.18 | 1.39 | 230.3 | 134.1 | 2,225 | 236 | 1.19 | |
| 2.50 to <10.00 | BB- to B- | 4.47 | 4.54 | 94.7 | 83.9 | 4,824 | 274 | 3.32 | |
| 10.00 to <100.00 | B- to CCC- | 21.81 | 20.58 | 18.2 | 13.5 | 3,633 | 74 | 16.06 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 19.2 | 23.9 | 126 | 3 | 0.00 | |
| Sub-total | N/M | 0.93 | 2.62 | 1,628.7 | 1,473.0 | 12,786 | 727 | 0.69 | |
| Other | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.10 | 0.09 | 283.1 | 285.1 | 212 | 16 | 0.07 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.22 | 251.1 | 251.7 | 405 | 98 | 0.13 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 270.0 | 237.7 | 864 | 147 | 0.23 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.66 | 0.67 | 355.8 | 285.4 | 1,838 | 207 | 0.42 | |
| 0.75 to <2.50 | BB+ to BB- | 1.54 | 1.54 | 840.4 | 844.8 | 10,556 | 2,334 | 1.10 | |
| 2.50 to <10.00 | BB- to B- | 4.52 | 4.60 | 431.7 | 495.1 | 15,527 | 2,327 | 2.98 | |
| 10.00 to <100.00 | B- to CCC- | 20.10 | 25.19 | 121.3 | 117.8 | 23,736 | 810 | 18.98 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 41.6 | 49.5 | 3,065 | 69 | 13.22 | |
| Sub-total | N/M | 8.61 | 5.68 | 2,595.0 | 2,567.1 | 56,203 | 6,008 | 1.97 | |

¹ Methodology and processes have been revised leading to adjusted numbers of obligors at year end 2017 including a shift of customers from "Corporate - Other" into "Corporate - Specialized lending".

| | | Dec 31, 2017 | | | | | | |
|--|----------------------------------|-------------------------------------|--|---|-----------------------------------|--------------------------------------|--|---|
| a/b | c | d | e | f | | g | h | i |
| | | | | Number of obligors | | | | |
| Exposure class/ PD Range | External rating equivalent | Weighted average PD (in %) | Arithmetic average PD by obligors (in %) | End of previous year (in 1,000s) | End of the year (in 1,000s) | Defaulted obligors in the year | of which new obligors in the year | Average historical annual default rate ¹ (in %) |
| Central governments and central banks | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.01 | 0.03 | 0.2 | 0.3 | 0 | 0 | 0.00 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| 0.75 to <2.50 | BB+ to BB- | 1.49 | 1.37 | <0.1 | <0.1 | 0 | 0 | 0.49 |
| 2.50 to <10.00 | BB- to B- | 3.99 | 4.18 | <0.1 | <0.1 | 0 | 0 | 0.61 |
| 10.00 to <100.00 | B- to CCC- | 13.00 | 13.00 | <0.1 | <0.1 | 3 | 0 | 11.88 |
| 100.00 (Default) | CCC- to D | 100.00 | N/M | 0 | 0 | 0 | 0 | N/M |
| Sub-total | N/M | 0.08 | 1.64 | 0.4 | 0.4 | 3 | 0 | 0.34 |
| Institutions | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.05 | 0.07 | 0.8 | 0.8 | 0 | 0 | 0.00 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.75 to <2.50 | BB+ to BB- | 1.53 | 1.34 | 0.1 | 0.1 | 0 | 0 | 0.42 |
| 2.50 to <10.00 | BB- to B- | 4.14 | 4.54 | 0.1 | <0.1 | 2 | 1 | 1.16 |
| 10.00 to <100.00 | B- to CCC- | 15.23 | 22.19 | <0.1 | <0.1 | 2 | 0 | 9.43 |
| 100.00 (Default) | CCC- to D | 100.00 | N/M | 0 | 0 | 0 | 0 | N/M |
| Sub-total | N/M | 0.61 | 1.78 | 1.3 | 1.2 | 4 | 1 | 0.36 |
| Corporates | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.06 | 0.06 | 28.4 | 28.5 | 8 | 0 | 0.03 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 6.1 | 6.1 | 4 | 0 | 0.09 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 6.1 | 6.1 | 19 | 0 | 0.25 |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | 5.2 | 5.3 | 19 | 2 | 0.39 |
| 0.75 to <2.50 | BB+ to BB- | 1.39 | 1.37 | 7.8 | 7.5 | 141 | 62 | 0.87 |
| 2.50 to <10.00 | BB- to B- | 4.87 | 4.65 | 4.1 | 3.9 | 83 | 3 | 2.51 |
| 10.00 to <100.00 | B- to CCC- | 18.15 | 20.74 | 1.0 | 0.9 | 91 | 6 | 10.20 |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.1 | 0.1 | 0 | 0 | 15.71 |
| Sub-total | N/M | 3.06 | 3.12 | 58.7 | 58.3 | 365 | 73 | 0.54 |
| of which: | | | | | | | | |
| SMEs | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.08 | 0.08 | 4.3 | 5.4 | 2 | 0 | 0.07 |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 1.8 | 2.0 | 4 | 0 | 0.14 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 1.9 | 2.1 | 8 | 0 | 0.50 |
| 0.50 to <0.75 | BBB- to BB+ | 0.65 | 0.65 | 1.6 | 1.8 | 10 | 0 | 0.72 |
| 0.75 to <2.50 | BB+ to BB- | 1.41 | 1.38 | 2.1 | 2.4 | 34 | 0 | 1.09 |
| 2.50 to <10.00 | BB- to B- | 4.80 | 4.54 | 1.1 | 1.3 | 30 | 0 | 3.25 |
| 10.00 to <100.00 | B- to CCC- | 20.74 | 21.50 | 0.3 | 0.3 | 30 | 1 | 13.41 |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 33.33 |
| Sub-total | N/M | 4.72 | 2.91 | 13.0 | 15.3 | 118 | 1 | 1.46 |
| Specialized lending | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.07 | 0.06 | 0.1 | <0.1 | 0 | 0 | 0.00 |
| 0.15 to <0.25 | BBB+ to BBB | 0.20 | 0.20 | 0.1 | 0.1 | 0 | 0 | 0.56 |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.38 | 0.1 | 0.1 | 0 | 0 | 0.00 |
| 0.50 to <0.75 | BBB- to BB+ | 0.66 | 0.67 | <0.1 | <0.1 | 0 | 0 | 0.00 |
| 0.75 to <2.50 | BB+ to BB- | 1.39 | 1.53 | 0.1 | 0.1 | 0 | 0 | 0.48 |
| 2.50 to <10.00 | BB- to B- | 5.19 | 4.99 | <0.1 | <0.1 | 0 | 0 | 4.44 |
| 10.00 to <100.00 | B- to CCC- | 17.52 | 17.68 | <0.1 | <0.1 | 1 | 0 | 8.33 |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | N/M |
| Sub-total | N/M | 12.97 | 7.21 | 0.4 | 0.3 | 1 | 0 | 0.66 |

| | | Dec 31, 2017 | | | | | | | |
|---------------------------------|----------------------------------|-------------------------------------|--|---|-----------------------------------|--------------------------------------|--|---|---|
| a/b | c | d | e | f | | | g | h | i |
| | | Number of obligors | | | | | | | |
| Exposure class/ PD Range | External rating equivalent | Weighted average PD (in %) | Arithmetic average PD by obligors (in %) | End of previous year (in 1,000s) | End of the year (in 1,000s) | Defaulted obligors in the year | of which new obligors in the year | Average historical annual default rate ¹ (in %) | |
| Other | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.05 | 0.06 | 24.1 | 23.1 | 6 | 0 | 0.03 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 4.2 | 4.0 | 0 | 0 | 0.06 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 4.2 | 3.9 | 11 | 0 | 0.22 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.64 | 0.64 | 3.5 | 3.4 | 9 | 2 | 0.34 | |
| 0.75 to <2.50 | BB+ to BB- | 1.39 | 1.36 | 5.6 | 5.0 | 107 | 62 | 0.80 | |
| 2.50 to <10.00 | BB- to B- | 4.72 | 4.65 | 3.0 | 2.6 | 53 | 3 | 2.40 | |
| 10.00 to <100.00 | B- to CCC- | 19.56 | 20.86 | 0.7 | 0.6 | 60 | 5 | 9.82 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.1 | 0.1 | 0 | 0 | 13.33 | |
| Sub-total | N/M | 1.93 | 2.83 | 45.3 | 42.7 | 246 | 72 | 0.48 | |
| Retail | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.10 | 0.09 | 1,352.3 | 1,338.1 | 649 | 30 | 0.05 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.22 | 666.8 | 651.2 | 799 | 49 | 0.12 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 664.5 | 645.0 | 1,609 | 271 | 0.22 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.66 | 0.66 | 711.4 | 741.1 | 3,141 | 529 | 0.38 | |
| 0.75 to <2.50 | BB+ to BB- | 1.42 | 1.41 | 1,263.6 | 1,290.3 | 13,278 | 2,150 | 1.01 | |
| 2.50 to <10.00 | BB- to B- | 4.53 | 4.51 | 642.7 | 629.0 | 20,969 | 2,598 | 2.75 | |
| 10.00 to <100.00 | B- to CCC- | 20.49 | 20.59 | 156.1 | 159.1 | 29,846 | 965 | 17.59 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 39.1 | 70.6 | 4,799 | 575 | 24.47 | |
| Sub-total | N/M | 3.33 | 3.71 | 5,496.3 | 5,524.3 | 75,090 | 7,167 | 1.33 | |
| of which: | | | | | | | | | |
| Secured by real estate property | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.10 | 0.09 | 236.8 | 205.7 | 76 | 0 | 0.06 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.21 | 268.8 | 255.5 | 131 | 1 | 0.12 | |
| 0.25 to <0.50 | BBB to BBB- | 0.38 | 0.38 | 270.5 | 262.4 | 279 | 1 | 0.21 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.67 | 0.67 | 248.8 | 242.2 | 423 | 8 | 0.31 | |
| 0.75 to <2.50 | BB+ to BB- | 1.41 | 1.42 | 229.2 | 226.5 | 784 | 11 | 0.45 | |
| 2.50 to <10.00 | BB- to B- | 4.51 | 4.48 | 107.1 | 105.6 | 1,046 | 7 | 1.55 | |
| 10.00 to <100.00 | B- to CCC- | 20.86 | 21.08 | 25.2 | 20.5 | 2,708 | 8 | 11.96 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 10.8 | 9.7 | 551 | 0 | 40.39 | |
| Sub-total | N/M | 2.46 | 2.37 | 1,397.2 | 1,328.0 | 5,998 | 36 | 0.67 | |
| Qualifying revolving | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.08 | 0.08 | 848.8 | 849.8 | 282 | 17 | 0.02 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.23 | 0.23 | 149.5 | 146.6 | 252 | 13 | 0.09 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 119.7 | 121.0 | 418 | 31 | 0.19 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.65 | 0.65 | 108.7 | 148.8 | 705 | 101 | 0.36 | |
| 0.75 to <2.50 | BB+ to BB- | 1.39 | 1.31 | 156.6 | 230.3 | 2,047 | 419 | 1.14 | |
| 2.50 to <10.00 | BB- to B- | 4.45 | 4.50 | 88.7 | 94.7 | 3,573 | 433 | 2.77 | |
| 10.00 to <100.00 | B- to CCC- | 20.73 | 19.65 | 16.6 | 18.2 | 3,070 | 159 | 14.58 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.8 | 19.2 | 58 | 0 | 0.00 | |
| Sub-total | N/M | 1.16 | 1.47 | 1,489.3 | 1,628.7 | 10,405 | 1,173 | 0.68 | |
| Other | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.08 | 0.09 | 266.7 | 282.7 | 291 | 13 | 0.10 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.22 | 0.22 | 248.5 | 249.1 | 416 | 35 | 0.15 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.39 | 274.2 | 261.6 | 912 | 239 | 0.25 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.65 | 0.65 | 353.9 | 350.1 | 2,013 | 420 | 0.44 | |
| 0.75 to <2.50 | BB+ to BB- | 1.47 | 1.43 | 877.8 | 833.5 | 10,447 | 1,720 | 1.17 | |
| 2.50 to <10.00 | BB- to B- | 4.57 | 4.50 | 446.8 | 428.7 | 16,350 | 2,158 | 3.04 | |
| 10.00 to <100.00 | B- to CCC- | 19.74 | 20.78 | 114.3 | 120.4 | 24,068 | 798 | 19.74 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 27.5 | 41.6 | 4,190 | 575 | 20.06 | |
| Sub-total | N/M | 7.80 | 5.77 | 2,609.8 | 2,567.6 | 58,687 | 5,958 | 2.05 | |

¹ Please note that some of the %-figures show rounding differences compared to the 2017 Pillar 3 report.

Foundation IRBA – Model validation results

The below table summarizes the outcome of the model validations for the risk parameter PD used in our foundation IRBA for DB PFK AG on the ex Postbank portfolio. If individual risk parameter settings are classified as appropriate, no recalibration was triggered by the validation. The breakdown is presented by number as well as by the relative EAD attached to the respective parameter as of December 31, 2018 and as of December 31, 2017.

Validation results of risk parameters used in our Foundation IRBA at Postbank

| | 2018 | | PD 2017 | |
|---|----------|----------------|------------|----------------|
| | Count | EAD in % | Count | EAD in % |
| Appropriate | 1 | 100.0 | 1 | 100.0 |
| Overly conservative | 0 | 0.0 | 0 | 0.0 |
| Progressive | 0 | 0.0 | 0 | 0.0 |
| Total | 1 | 100.0 | 1 | 100.0 |
| Of which already recalibrated and introduced | | in 2018 | | in 2017 |
| Overly conservative | 0 | 0.0 | 0 | 0.0 |
| Progressive | 0 | 0.0 | 0 | 0.0 |
| Total | 0 | 0.0 | 0 | 0.0 |

The performed analyses classify the PD parameter setting for the foundation IRBA relevant rating system of DB PFK AG on the ex Postbank portfolio as appropriate.

The below table EU CR9 aims at providing backtesting information for probabilities of default (“PD”) in comparing the PD used in the foundation IRB capital calculations with the effective obligors’ default rates presented on a five year average by regulatory exposure classes. The conceptual design as well as the structural limitations to be considered are the same as described above for the advanced IRB backtesting table.

EU CR9 IRB backtesting of PD per exposure class for Foundation IRBA

| | | | | | | | | | Dec 31, 2018 |
|--|----------------------------------|-------------------------------------|--|---|-----------------------------------|--------------------------------------|--|---|--------------|
| a/b | c | d | e | f | | g | h | i | |
| Exposure class/ PD Range | External rating equivalent | Weighted average PD (in %) | Arithmetic average PD by obligors (in %) | Number of obligors | | Defaulted obligors in the year | of which new obligors in the year | Average historical annual de- fault rate (in %) | |
| | | | | End of previous year (in 1,000s) | End of the year (in 1,000s) | | | | |
| Central governments and central banks | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.75 to <2.50 | BB+ to BB- | 0.00 | 0.00 | 0 | <0.1 | 0 | 0 | 0.00 | |
| 2.50 to <10.00 | BB- to B- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 10.00 to <100.00 | B- to CCC- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 100.00 (Default) | CCC- to D | 100.00 | 0.00 | <0.1 | 0 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 100.00 | 0.00 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| Institutions | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.10 | 0.08 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.19 | 0.21 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.38 | 0.38 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.69 | 0.69 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.75 to <2.50 | BB+ to BB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 2.50 to <10.00 | BB- to B- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 10.00 to <100.00 | B- to CCC- | 19.99 | 20.00 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 100.00 (Default) | CCC- to D | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 0.14 | 2.75 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| Corporates | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.08 | 0.10 | 0.4 | 4.3 | 1 | 0 | 0.78 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.18 | 0.21 | 2.2 | 2.1 | 5 | 2 | 0.25 | |
| 0.25 to <0.50 | BBB to BBB- | 0.33 | 0.38 | 2.5 | 2.7 | 3 | 1 | 0.18 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.56 | 0.69 | 1.5 | 1.2 | 0 | 0 | 0.09 | |
| 0.75 to <2.50 | BB+ to BB- | 1.02 | 1.36 | 0.6 | 0.7 | 1 | 0 | 0.81 | |
| 2.50 to <10.00 | BB- to B- | 5.02 | 5.30 | <0.1 | 0.1 | 2 | 1 | 3.04 | |
| 10.00 to <100.00 | B- to CCC- | 14.54 | 19.16 | 0.1 | 0.1 | 2 | 0 | 1.14 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.1 | 0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 1.42 | 1.68 | 7.4 | 11.2 | 14 | 4 | 0.38 | |
| of which: | | | | | | | | | |
| SMEs | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.20 | 0.21 | 0.1 | 0.1 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.33 | 0.38 | <0.1 | <0.1 | 0 | 0 | 0.38 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.62 | 0.69 | <0.1 | <0.1 | 0 | 0 | 0.43 | |
| 0.75 to <2.50 | BB+ to BB- | 1.33 | 1.43 | <0.1 | <0.1 | 0 | 0 | 3.50 | |
| 2.50 to <10.00 | BB- to B- | 3.78 | 4.77 | <0.1 | <0.1 | 1 | 0 | 10.11 | |
| 10.00 to <100.00 | B- to CCC- | 15.26 | 18.68 | <0.1 | <0.1 | 0 | 0 | 1.09 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 0.61 | 2.44 | 0.2 | 0.2 | 1 | 0 | 1.31 | |
| Specialized lending | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.75 to <2.50 | BB+ to BB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 2.50 to <10.00 | BB- to B- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 10.00 to <100.00 | B- to CCC- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 100.00 (Default) | CCC- to D | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| Other | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.08 | 0.10 | 0.4 | 4.3 | 1 | 0 | 0.78 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.18 | 0.21 | 2.2 | 2.0 | 5 | 2 | 0.26 | |
| 0.25 to <0.50 | BBB to BBB- | 0.33 | 0.38 | 2.4 | 2.7 | 3 | 1 | 0.18 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.56 | 0.69 | 1.5 | 1.2 | 0 | 0 | 0.08 | |
| 0.75 to <2.50 | BB+ to BB- | 1.01 | 1.36 | 0.6 | 0.7 | 1 | 0 | 0.59 | |
| 2.50 to <10.00 | BB- to B- | 5.03 | 5.41 | <0.1 | 0.1 | 1 | 1 | 1.78 | |
| 10.00 to <100.00 | B- to CCC- | 14.50 | 19.15 | 0.1 | 0.1 | 2 | 0 | 1.04 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.1 | 0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 1.42 | 1.66 | 7.2 | 11.1 | 13 | 4 | 0.33 | |

| | | | | | | | | | Dec 31, 2017 |
|--|----------------------------------|-------------------------------------|--|---|-----------------------------------|--------------------------------------|--|---|--------------|
| a/b | c | d | e | f | | g | h | i | |
| Exposure class/ PD Range | External rating equivalent | Weighted average PD (in %) | Arithmetic average PD by obligors (in %) | Number of obligors | | Defaulted obligors in the year | of which new obligors in the year | Average historical annual de- fault rate (in %) | |
| | | | | End of previous year (in 1,000s) | End of the year (in 1,000s) | | | | |
| Central governments and central banks | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.75 to <2.50 | BB+ to BB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 2.50 to <10.00 | BB- to B- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 10.00 to <100.00 | B- to CCC- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| Institutions | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.06 | 0.06 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.14 | 0.22 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.39 | 0.38 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.55 | 0.69 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 0.75 to <2.50 | BB+ to BB- | 2.17 | 2.17 | <0.1 | 0 | 0 | 0 | 0.00 | |
| 2.50 to <10.00 | BB- to B- | 3.14 | 4.83 | <0.1 | 0 | 0 | 0 | 0.00 | |
| 10.00 to <100.00 | B- to CCC- | 11.53 | 18.31 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| 100.00 (Default) | CCC- to D | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 3.83 | 4.46 | 0.1 | <0.1 | 0 | 0 | 0.00 | |
| Corporates | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.09 | 0.10 | 0.3 | 0.4 | 0 | 0 | 0.73 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.18 | 0.21 | 1.9 | 2.2 | 2 | 0 | 0.26 | |
| 0.25 to <0.50 | BBB to BBB- | 0.32 | 0.38 | 2.2 | 2.5 | 0 | 0 | 0.23 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.56 | 0.69 | 1.4 | 1.5 | 1 | 0 | 0.27 | |
| 0.75 to <2.50 | BB+ to BB- | 0.96 | 1.37 | 0.6 | 0.6 | 6 | 0 | 1.22 | |
| 2.50 to <10.00 | BB- to B- | 5.45 | 6.01 | <0.1 | <0.1 | 2 | 0 | 3.01 | |
| 10.00 to <100.00 | B- to CCC- | 19.03 | 19.07 | 0.1 | 0.1 | 1 | 0 | 2.11 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.1 | 0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 1.70 | 2.42 | 6.6 | 7.4 | 12 | 0 | 0.64 | |
| of which: | | | | | | | | | |
| SMEs | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.21 | 0.22 | <0.1 | 0.1 | 0 | 0 | 0.08 | |
| 0.25 to <0.50 | BBB to BBB- | 0.38 | 0.38 | <0.1 | <0.1 | 0 | 0 | 0.62 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.58 | 0.69 | <0.1 | <0.1 | 1 | 0 | 0.85 | |
| 0.75 to <2.50 | BB+ to BB- | 1.75 | 1.60 | <0.1 | <0.1 | 3 | 0 | 4.07 | |
| 2.50 to <10.00 | BB- to B- | 3.87 | 5.27 | <0.1 | <0.1 | 1 | 0 | 8.68 | |
| 10.00 to <100.00 | B- to CCC- | 14.44 | 18.89 | <0.1 | <0.1 | 0 | 0 | 7.38 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | <0.1 | <0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 2.11 | 5.84 | 0.2 | 0.2 | 5 | 0 | 1.82 | |
| Specialized lending | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.25 to <0.50 | BBB to BBB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 0.75 to <2.50 | BB+ to BB- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 2.50 to <10.00 | BB- to B- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 10.00 to <100.00 | B- to CCC- | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| 100.00 (Default) | CCC- to D | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.00 | |
| Other | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB+ | 0.09 | 0.10 | 0.3 | 0.4 | 0 | 0 | 0.73 | |
| 0.15 to <0.25 | BBB+ to BBB | 0.18 | 0.21 | 1.8 | 2.2 | 2 | 0 | 0.25 | |
| 0.25 to <0.50 | BBB to BBB- | 0.32 | 0.38 | 2.1 | 2.4 | 0 | 0 | 0.15 | |
| 0.50 to <0.75 | BBB- to BB+ | 0.56 | 0.69 | 1.4 | 1.5 | 0 | 0 | 0.15 | |
| 0.75 to <2.50 | BB+ to BB- | 0.95 | 1.36 | 0.5 | 0.6 | 3 | 0 | 0.90 | |
| 2.50 to <10.00 | BB- to B- | 5.47 | 6.22 | <0.1 | <0.1 | 1 | 0 | 1.68 | |
| 10.00 to <100.00 | B- to CCC- | 19.03 | 18.95 | 0.1 | 0.1 | 1 | 0 | 0.87 | |
| 100.00 (Default) | CCC- to D | 100.00 | 100.00 | 0.1 | 0.1 | 0 | 0 | 0.00 | |
| Sub-total | N/M | 1.70 | 2.30 | 6.4 | 7.2 | 7 | 0 | 0.42 | |

Comparison of expected loss estimates with actual losses

In addition to the above, the comparison of regulatory expected loss ("EL") estimates with actual losses recorded also provides some insight into the predictive power of our parameter estimations and, therefore, EL calculations.

The EL used in this comparison is the forecast credit loss from counterparty defaults of our exposures over a one year period and is computed as the product of PD, LGD and EAD for performing exposures as of December 31 of the preceding year. The actual loss measure is defined by us as new provisions on newly impaired exposures recorded in our financial statements through profit and loss during the respective reported years.

While we believe that this approach provides some insight, the comparison has limitations as the two measures are not directly comparable. In particular, the parameter LGD underlying the EL calculation represents the loss expectation until finalization of the workout period while the actual loss as defined above represents the accounting information recorded for one particular financial year. Furthermore, EL is a measure of expected credit losses for a snapshot of our credit exposure at a certain balance sheet date while the actual loss is recorded for a fluctuating credit portfolio over the course of a financial year, i.e., including losses in relation to new loans entered into during the year.

According to the methodology described above, the following table provides a comparison of EL estimates for loans, commitments and contingent liabilities as of year-end 2013 through 2017, with actual losses recorded for the financial years 2018 through 2014, by regulatory exposure class for advanced IRBA exposures.

Comparison of expected loss estimates for loans, commitments and contingent liabilities with actual losses recorded by regulatory exposure class for advanced IRBA exposures

| in € m. | Dec 31, 2017 | 2018 | Dec 31, 2016 | 2017 | Dec 31, 2015 | 2016 | Dec 31, 2014 | 2015 | Dec 31, 2013 | 2014 |
|---|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| | Expected loss | Actual loss | Expected loss | Actual loss | Expected loss | Actual loss | Expected loss | Actual loss | Expected loss | Actual loss |
| Central governments and central banks | 22 | 0 | 3 | 4 | 2 | 3 | 3 | 0 | 3 | 0 |
| Institutions | 12 | 0 | 16 | 0 | 12 | 0 | 12 | 0 | 13 | 4 |
| Corporates | 494 | 493 | 512 | 198 | 369 | 697 | 300 | 334 | 355 | 229 |
| Retail exposures secured by real estate property | 134 | 143 | 285 | 98 | 305 | 177 | 306 | 207 | 324 | 212 |
| Qualifying revolving retail exposures | 7 | 26 | 14 | 15 | 13 | 4 | 17 | 4 | 21 | 8 |
| Other retail exposures | 233 | 403 | 405 | 349 | 339 | 704 | 334 | 354 | 378 | 355 |
| Total expected loss and actual loss in the advanced IRBA | 903 | 1,065 | 1,236 | 665 | 1,041 | 1,584 | 971 | 900 | 1,095 | 808 |

The actual loss in 2018 was higher than the expected loss driven by Retail exposures.

Actual loss in 2017 was lower than expected, driven by Corporates as well as Retail exposures, mainly reflecting the strong reduction in actual loss compared to prior year in the respective exposure classes, as further discussed below.

The actual loss in 2016 exceeded the expected loss by € 543 million or 52 % mainly driven by exposures in Corporates as well as in Other Retail, where we faced higher than expected increases in actual loss, as discussed below.

Actual loss in 2015 was lower than expected, mainly driven by Retail exposures secured by real estate property.

Actual loss in 2014 was below expectations mainly driven by a significant outperformance in corporate exposures as well as in Retail exposures secured by real estate property.

The decrease in expected loss as of December 31, 2014 in comparison to December 31, 2013 is mainly driven by lower volumes and to less extent by partially lower LGD parameters.

The following table provides a year-to-year comparison of the actual loss by regulatory exposure class.

Year-to-year comparison of the actual loss by IRBA exposure class

| in € m. | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|--------------|------------|--------------|------------|------------|
| Central governments and central banks | 0 | 4 | 3 | 0 | 0 |
| Institutions | 0 | 0 | 0 | 0 | 4 |
| Corporates | 493 | 198 | 697 | 334 | 229 |
| Retail exposures secured by real estate property | 143 | 98 | 177 | 207 | 212 |
| Qualifying revolving retail exposures | 26 | 15 | 4 | 4 | 8 |
| Other retail exposures | 403 | 349 | 704 | 354 | 355 |
| Total actual loss by IRBA in the advanced IRBA | 1,065 | 665 | 1,584 | 900 | 808 |

The increase in actual loss in fiscal year 2018 was driven by Corporates within CIB.

The strong reduction in actual loss in fiscal year 2017 was driven by both, CIB and PCB. The decline in CIB resulted from lower actual losses amongst others against shipping companies, while the reduction in PCB was mainly caused by our retail portfolios in Italy and Spain.

In 2016 the actual loss increased by € 684 million or 76 % driven by our corporate and other retail portfolios. The increase in corporates was caused by higher actual losses for shipping- and metals & mining companies recorded in CIB, while the increase in other retail was caused by higher charges for our retail portfolios in Italy and Spain among others related to the sale of non-performing loans.

Actual loss increased by € 92 million or 11 % in 2015 compared to prior year driven by our shipping and leveraged finance portfolios recorded in CIB.

Article 452 (j) CRR - IRB exposure by country where Deutsche Bank operates

Advanced IRBA

The table below shows our Advanced IRBA exposure for credit risk distributed based on the corresponding exposure classes for each relevant geographical location. As geographical location we show countries where the Group maintains a branch or subsidiary. Exposure which does not meet these criteria is shown in "Other", which also comprises exposure to international organizations. Exposures are assigned to the specific geographical location based on the country of domicile of the respective counterparty. The EAD net is presented in conjunction with exposures-weighted average LGD and PD in percentage. It excludes the following exposure classes: securitization positions in the regulatory banking book, specific equity positions and non-credit obligation assets.

EAD net, average LGD and average PD of Advanced IRBA credit exposures by geographical location

Dec 31, 2018

| in € m. (unless stated otherwise) | Central govern- ments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---|--------------|------------|--|--|-----------------------------------|------------------------|----------------------------|---------|
| Australia | | | | | | | | | |
| EAD net | 464 | 660 | 1,510 | 2 | 6 | 1 | 1 | 2 | 2,647 |
| Average LGD in % | 33.99 | 44.90 | 24.69 | 29.51 | 16.45 | 23.12 | 42.82 | 22.96 | 31.35 |
| Average PD in % | 0.02 | 0.19 | 14.08 | 0.23 | 2.14 | 0.40 | 0.56 | 3.94 | 8.09 |
| Austria | | | | | | | | | |
| EAD net | 38 | 87 | 696 | 5 | 41 | 7 | 4 | 11 | 889 |
| Average LGD in % | 50.00 | 11.48 | 35.74 | 10.39 | 13.27 | 12.24 | 41.35 | 31.51 | 32.58 |
| Average PD in % | 0.00 | 0.07 | 2.13 | 1.13 | 1.13 | 0.75 | 0.51 | 5.05 | 1.80 |
| Belgium | | | | | | | | | |
| EAD net | 540 | 672 | 1,341 | 1 | 33 | 4 | 2 | 7 | 2,600 |
| Average LGD in % | 50.09 | 38.12 | 23.03 | 11.38 | 19.03 | 12.98 | 42.44 | 34.03 | 32.53 |
| Average PD in % | 0.00 | 0.06 | 11.98 | 0.89 | 3.02 | 0.89 | 0.64 | 8.90 | 6.26 |
| Brazil | | | | | | | | | |
| EAD net | 189 | 469 | 522 | 0 | 10 | 1 | 2 | 32 | 1,225 |
| Average LGD in % | 50.00 | 42.68 | 44.45 | N/M | 10.63 | 26.95 | 42.53 | 6.78 | 43.35 |
| Average PD in % | 0.64 | 1.04 | 8.59 | N/M | 1.51 | 0.51 | 0.43 | 3.71 | 4.27 |
| Canada | | | | | | | | | |
| EAD net | 68 | 934 | 1,032 | 0 | 5 | 1 | 2 | 7 | 2,049 |
| Average LGD in % | 32.69 | 26.15 | 34.49 | N/M | 23.26 | 23.64 | 42.47 | 16.27 | 30.55 |
| Average PD in % | 0.03 | 0.04 | 4.00 | N/M | 1.57 | 0.78 | 4.46 | 1.79 | 2.05 |
| China | | | | | | | | | |
| EAD net | 1,886 | 2,050 | 4,560 | 0 | 21 | 2 | 3 | 4 | 8,525 |
| Average LGD in % | 50.21 | 28.84 | 44.42 | N/M | 15.30 | 24.81 | 44.21 | 19.28 | 41.87 |
| Average PD in % | 0.00 | 0.19 | 0.96 | N/M | 1.65 | 1.22 | 0.60 | 3.40 | 0.56 |
| Czech Republic | | | | | | | | | |
| EAD net | 0 | 214 | 91 | 0 | 5 | 1 | 2 | 3 | 316 |
| Average LGD in % | N/M | 45.08 | 43.57 | N/M | 17.91 | 11.95 | 42.69 | 53.62 | 44.21 |
| Average PD in % | N/M | 0.07 | 0.11 | N/M | 0.42 | 2.58 | 0.49 | 22.20 | 0.33 |
| France | | | | | | | | | |
| EAD net | 673 | 1,099 | 4,135 | 1 | 66 | 10 | 8 | 94 | 6,087 |
| Average LGD in % | 51.53 | 34.47 | 31.22 | 6.24 | 15.24 | 15.20 | 42.64 | 14.69 | 33.61 |
| Average PD in % | 0.00 | 0.15 | 1.54 | 2.99 | 4.10 | 1.22 | 0.64 | 4.21 | 1.18 |
| Germany | | | | | | | | | |
| EAD net | 6,823 | 1,878 | 39,539 | 8,814 | 136,620 | 11,980 | 2,809 | 20,184 | 228,646 |
| Average LGD in % | 82.53 | 30.37 | 34.24 | 11.27 | 14.13 | 11.66 | 32.63 | 42.25 | 22.30 |
| Average PD in % | 1.16 | 0.17 | 2.82 | 1.76 | 1.91 | 1.00 | 2.27 | 6.50 | 2.39 |
| Greece | | | | | | | | | |
| EAD net | 0 | 3 | 584 | 0 | 4 | 1 | 0 | 3 | 594 |
| Average LGD in % | N/M | 46.74 | 16.39 | N/M | 17.39 | 23.27 | 25.70 | 26.99 | 16.60 |
| Average PD in % | N/M | 22.00 | 36.30 | N/M | 0.41 | 2.14 | 0.23 | 5.35 | 35.81 |
| Hong Kong | | | | | | | | | |
| EAD net | 343 | 411 | 4,918 | 0 | 14 | 0 | 0 | 1 | 5,687 |
| Average LGD in % | 50.00 | 37.47 | 25.78 | 3.66 | 19.45 | 30.73 | 40.83 | 19.73 | 28.07 |
| Average PD in % | 0.00 | 0.09 | 3.58 | 1.07 | 0.47 | 0.36 | 60.67 | 0.16 | 3.11 |
| Hungary | | | | | | | | | |
| EAD net | 212 | 3 | 134 | 0 | 3 | 1 | 1 | 2 | 356 |
| Average LGD in % | 50.00 | 9.82 | 44.89 | N/M | 15.99 | 15.35 | 42.69 | 54.67 | 47.36 |
| Average PD in % | 0.14 | 0.76 | 0.16 | N/M | 1.67 | 6.56 | 0.47 | 26.12 | 0.37 |
| India | | | | | | | | | |
| EAD net | 2,861 | 1,041 | 6,183 | 0 | 3 | 2 | 3 | 22 | 10,115 |
| Average LGD in % | 49.96 | 22.29 | 40.35 | N/M | 18.30 | 33.35 | 42.46 | 41.66 | 41.20 |
| Average PD in % | 0.23 | 0.54 | 5.52 | N/M | 0.49 | 2.54 | 0.46 | 1.37 | 3.50 |
| Indonesia | | | | | | | | | |
| EAD net | 619 | 0 | 1,724 | 0 | 1 | 0 | 1 | 0 | 2,345 |
| Average LGD in % | 50.00 | N/M | 41.69 | N/M | 11.77 | 27.45 | 42.69 | 47.56 | 43.87 |
| Average PD in % | 0.23 | N/M | 2.26 | N/M | 0.51 | 1.15 | 0.23 | 1.89 | 1.72 |
| Ireland | | | | | | | | | |
| EAD net | 0 | 111 | 4,333 | 0 | 24 | 0 | 1 | 0 | 4,470 |
| Average LGD in % | N/M | 26.45 | 27.87 | N/M | 24.48 | 25.31 | 42.68 | 41.02 | 27.82 |
| Average PD in % | N/M | 51.21 | 24.94 | N/M | 5.31 | 1.84 | 0.69 | 9.36 | 25.48 |
| Israel | | | | | | | | | |
| EAD net | 0 | 0 | 143 | 3 | 12 | 0 | 0 | 1 | 159 |
| Average LGD in % | N/M | N/M | 34.47 | 42.01 | 25.47 | 25.95 | 42.62 | 14.45 | 33.76 |
| Average PD in % | N/M | N/M | 0.47 | 0.09 | 6.81 | 1.18 | 0.88 | 2.10 | 0.94 |
| Italy (incl. San Marino) | | | | | | | | | |
| EAD net | 1,437 | 186 | 6,867 | 182 | 7,510 | 52 | 1,171 | 6,839 | 24,244 |

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| in € m. (unless stated otherwise) | Central governments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---------------------------------------|--------------|------------|-----------------------------------|---------------------------------------|-----------------------------|------------------|----------------------|-------|
| Average LGD in % | 50.42 | 30.26 | 41.70 | 30.18 | 12.79 | 66.76 | 60.92 | 58.67 | 38.86 |
| Average PD in % | 0.14 | 0.83 | 7.88 | 33.32 | 4.69 | 5.04 | 11.10 | 12.06 | 7.90 |
| Japan | | | | | | | | | |
| EAD net | 4,926 | 397 | 1,125 | 0 | 5 | 1 | 0 | 0 | 6,453 |
| Average LGD in % | 50.08 | 40.53 | 19.74 | N/M | 11.73 | 24.63 | 42.67 | 39.05 | 44.17 |
| Average PD in % | 0.00 | 0.04 | 1.23 | N/M | 2.19 | 0.18 | 0.63 | 0.59 | 0.22 |
| Jersey | | | | | | | | | |
| EAD net | 0 | 0 | 1,013 | 0 | 0 | 0 | 0 | 0 | 1,013 |
| Average LGD in % | N/M | N/M | 17.60 | N/M | N/M | N/M | N/M | 34.80 | 17.60 |
| Average PD in % | N/M | N/M | 5.67 | N/M | N/M | N/M | N/M | 0.04 | 5.67 |
| Luxembourg | | | | | | | | | |
| EAD net | 2 | 261 | 7,201 | 5 | 30 | 1 | 0 | 4 | 7,504 |
| Average LGD in % | 50.00 | 46.04 | 22.56 | 22.28 | 17.72 | 16.83 | 34.61 | 34.61 | 23.37 |
| Average PD in % | 0.00 | 0.06 | 2.46 | 1.86 | 2.75 | 0.39 | 0.42 | 2.77 | 2.38 |
| Malaysia | | | | | | | | | |
| EAD net | 326 | 0 | 846 | 0 | 2 | 0 | 0 | 0 | 1,174 |
| Average LGD in % | 50.00 | N/M | 46.10 | N/M | 13.94 | 24.31 | 42.69 | 23.56 | 47.12 |
| Average PD in % | 0.07 | N/M | 0.27 | N/M | 1.02 | 0.20 | 0.67 | 2.50 | 0.22 |
| Malta | | | | | | | | | |
| EAD net | 4 | 15 | 68 | 0 | 1 | 0 | 0 | 0 | 88 |
| Average LGD in % | 50.00 | 40.33 | 7.34 | N/M | 21.17 | 19.85 | 42.69 | 71.91 | 15.02 |
| Average PD in % | 0.00 | 0.51 | 8.39 | N/M | 2.04 | 0.29 | 0.68 | 39.10 | 6.63 |
| Mauritius | | | | | | | | | |
| EAD net | 0 | 0 | 214 | 0 | 0 | 0 | 0 | 0 | 215 |
| Average LGD in % | N/M | N/M | 22.78 | N/M | 17.27 | 30.90 | N/M | 47.10 | 22.77 |
| Average PD in % | N/M | N/M | 15.79 | N/M | 1.54 | 1.12 | N/M | 0.54 | 15.76 |
| Mexico | | | | | | | | | |
| EAD net | 127 | 44 | 727 | 0 | 3 | 1 | 1 | 5 | 907 |
| Average LGD in % | 50.00 | 31.31 | 42.49 | N/M | 12.76 | 28.48 | 42.69 | 20.40 | 42.75 |
| Average PD in % | 0.09 | 0.27 | 0.41 | N/M | 1.06 | 0.58 | 0.31 | 0.67 | 0.36 |
| Netherlands | | | | | | | | | |
| EAD net | 62 | 381 | 9,343 | 3 | 89 | 4 | 6 | 44 | 9,934 |
| Average LGD in % | 54.53 | 30.86 | 29.02 | 8.73 | 16.46 | 17.81 | 41.81 | 11.91 | 29.06 |
| Average PD in % | 0.00 | 0.20 | 4.26 | 0.80 | 1.54 | 1.88 | 4.41 | 1.49 | 4.04 |
| New Zealand | | | | | | | | | |
| EAD net | 0 | 47 | 41 | 0 | 1 | 0 | 0 | 0 | 90 |
| Average LGD in % | N/M | 66.64 | 22.51 | N/M | 10.52 | 22.32 | 40.74 | 25.27 | 45.49 |
| Average PD in % | N/M | 0.69 | 3.36 | N/M | 0.61 | 0.16 | 25.39 | 1.54 | 1.94 |
| Pakistan | | | | | | | | | |
| EAD net | 43 | 0 | 114 | 0 | 1 | 0 | 0 | 2 | 161 |
| Average LGD in % | 50.00 | N/M | 33.57 | N/M | 19.50 | 34.81 | N/M | 46.04 | 38.02 |
| Average PD in % | 7.95 | N/M | 5.21 | N/M | 3.07 | 1.90 | N/M | 2.12 | 5.89 |
| Philippines | | | | | | | | | |
| EAD net | 83 | 0 | 661 | 0 | 1 | 0 | 0 | 0 | 745 |
| Average LGD in % | 50.00 | N/M | 40.74 | N/M | 12.43 | 15.53 | 47.18 | 46.71 | 41.74 |
| Average PD in % | 0.14 | N/M | 0.32 | N/M | 0.31 | 1.42 | 0.53 | 24.85 | 0.30 |
| Poland | | | | | | | | | |
| EAD net | 2,426 | 11 | 764 | 2 | 2,418 | 2 | 5 | 18 | 5,646 |
| Average LGD in % | 50.00 | 25.90 | 37.24 | 25.60 | 30.22 | 15.74 | 44.96 | 65.99 | 39.78 |
| Average PD in % | 0.05 | 0.11 | 1.15 | 1.18 | 3.41 | 9.57 | 2.47 | 35.62 | 1.76 |
| Portugal | | | | | | | | | |
| EAD net | 0 | 17 | 737 | 34 | 1,318 | 1 | 76 | 743 | 2,925 |
| Average LGD in % | 11.65 | 19.15 | 39.95 | 11.00 | 10.66 | 19.02 | 27.29 | 10.62 | 18.52 |
| Average PD in % | 0.64 | 2.91 | 4.83 | 5.07 | 3.44 | 1.61 | 12.81 | 6.84 | 4.91 |
| Romania | | | | | | | | | |
| EAD net | 8 | 32 | 17 | 0 | 1 | 0 | 1 | 3 | 62 |
| Average LGD in % | 5.00 | 44.84 | 46.29 | N/M | 17.60 | 28.16 | 42.69 | 59.87 | 40.14 |
| Average PD in % | 100.00 | 1.10 | 0.16 | N/M | 0.19 | 11.62 | 0.48 | 27.89 | 15.16 |
| Russian Federation | | | | | | | | | |
| EAD net | 658 | 0 | 492 | 0 | 26 | 1 | 2 | 7 | 1,187 |
| Average LGD in % | 50.00 | N/M | 44.40 | N/M | 24.32 | 30.82 | 42.69 | 16.64 | 46.87 |
| Average PD in % | 0.39 | N/M | 0.55 | N/M | 3.44 | 1.28 | 0.33 | 2.07 | 0.54 |
| Saudi Arabia | | | | | | | | | |
| EAD net | 448 | 808 | 784 | 0 | 3 | 0 | 0 | 1 | 2,044 |
| Average LGD in % | 50.00 | 11.95 | 22.19 | N/M | 25.20 | 29.77 | 42.69 | 37.92 | 24.25 |
| Average PD in % | 0.05 | 0.12 | 1.78 | N/M | 0.59 | 1.43 | 0.40 | 0.95 | 0.74 |
| Singapore | | | | | | | | | |

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| in € m. (unless stated otherwise) | Central govern- ments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---|--------------|------------|--|--|-----------------------------------|------------------------|----------------------------|---------|
| EAD net | 1,882 | 233 | 7,943 | 0 | 14 | 1 | 0 | 2 | 10,075 |
| Average LGD in % | 50.00 | 32.00 | 16.45 | N/M | 15.28 | 23.76 | 42.14 | 12.79 | 23.07 |
| Average PD in % | 0.00 | 0.04 | 1.19 | N/M | 1.40 | 0.27 | 0.79 | 0.68 | 0.94 |
| South Africa | | | | | | | | | |
| EAD net | 58 | 39 | 374 | 0 | 4 | 1 | 0 | 5 | 481 |
| Average LGD in % | 50.00 | 50.79 | 26.70 | N/M | 18.77 | 26.95 | 40.40 | 29.13 | 31.41 |
| Average PD in % | 0.23 | 0.33 | 8.74 | N/M | 2.69 | 1.54 | 43.52 | 0.87 | 6.91 |
| South Korea | | | | | | | | | |
| EAD net | 1,698 | 0 | 2,409 | 0 | 2 | 0 | 0 | 0 | 4,109 |
| Average LGD in % | 50.01 | N/M | 43.02 | N/M | 17.32 | 26.48 | N/M | 47.68 | 45.90 |
| Average PD in % | 0.00 | N/M | 0.19 | N/M | 1.12 | 0.69 | N/M | 2.94 | 0.11 |
| Spain | | | | | | | | | |
| EAD net | 271 | 604 | 9,559 | 102 | 6,946 | 5 | 1,564 | 1,649 | 20,700 |
| Average LGD in % | 47.63 | 39.07 | 39.99 | 16.07 | 13.34 | 30.82 | 71.20 | 61.01 | 35.03 |
| Average PD in % | 2.06 | 7.33 | 25.01 | 14.14 | 3.56 | 2.45 | 7.16 | 15.87 | 14.86 |
| Sri Lanka | | | | | | | | | |
| EAD net | 107 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 210 |
| Average LGD in % | 50.00 | N/M | 49.33 | N/M | 26.20 | 22.14 | N/M | 46.25 | 49.66 |
| Average PD in % | 2.92 | N/M | 1.56 | N/M | 0.09 | 0.57 | N/M | 2.79 | 2.26 |
| Sweden | | | | | | | | | |
| EAD net | 0 | 511 | 1,129 | 0 | 19 | 1 | 2 | 1 | 1,664 |
| Average LGD in % | N/M | 29.63 | 32.58 | N/M | 21.31 | 16.94 | 49.32 | 52.49 | 31.57 |
| Average PD in % | N/M | 0.06 | 1.60 | N/M | 1.12 | 0.81 | 0.33 | 7.52 | 1.13 |
| Switzerland | | | | | | | | | |
| EAD net | 3,823 | 586 | 8,489 | 5 | 183 | 15 | 5 | 30 | 13,136 |
| Average LGD in % | 49.98 | 30.71 | 21.26 | 7.14 | 13.80 | 17.64 | 40.73 | 23.06 | 29.94 |
| Average PD in % | 0.00 | 0.07 | 7.93 | 0.52 | 2.67 | 0.87 | 0.39 | 6.00 | 5.18 |
| Taiwan | | | | | | | | | |
| EAD net | 506 | 0 | 564 | 0 | 0 | 0 | 0 | 9 | 1,079 |
| Average LGD in % | 50.00 | N/M | 28.76 | 6.10 | 12.06 | 22.91 | 42.69 | 49.63 | 38.89 |
| Average PD in % | 0.00 | N/M | 0.14 | 0.39 | 1.32 | 1.39 | 0.42 | 0.75 | 0.08 |
| Thailand | | | | | | | | | |
| EAD net | 712 | 0 | 1,031 | 0 | 1 | 1 | 0 | 1 | 1,746 |
| Average LGD in % | 50.00 | N/M | 44.59 | N/M | 16.31 | 15.23 | 42.68 | 24.41 | 46.76 |
| Average PD in % | 0.09 | N/M | 0.50 | N/M | 2.76 | 1.68 | 0.47 | 4.28 | 0.33 |
| Turkey | | | | | | | | | |
| EAD net | 60 | 1,564 | 465 | 0 | 4 | 1 | 0 | 3 | 2,097 |
| Average LGD in % | 48.09 | 10.36 | 50.28 | N/M | 18.77 | 25.70 | 42.67 | 33.75 | 20.36 |
| Average PD in % | 0.64 | 2.20 | 6.05 | N/M | 10.56 | 1.29 | 0.54 | 8.98 | 3.03 |
| Ukraine | | | | | | | | | |
| EAD net | 76 | 0 | 95 | 0 | 5 | 0 | 1 | 2 | 180 |
| Average LGD in % | 50.00 | N/M | 35.77 | N/M | 10.51 | 33.32 | 74.39 | 18.88 | 41.10 |
| Average PD in % | 7.95 | N/M | 37.99 | N/M | 0.98 | 1.57 | 1.76 | 0.00 | 23.53 |
| United Arab Emirates | | | | | | | | | |
| EAD net | 147 | 0 | 1,423 | 2 | 13 | 1 | 1 | 5 | 1,591 |
| Average LGD in % | 50.00 | N/M | 34.85 | 8.24 | 20.56 | 28.73 | 42.65 | 11.83 | 36.03 |
| Average PD in % | 0.00 | N/M | 1.97 | 0.64 | 3.51 | 1.26 | 0.43 | 2.57 | 1.80 |
| United Kingdom | | | | | | | | | |
| EAD net | 453 | 3,681 | 7,596 | 1 | 152 | 4 | 5 | 401 | 12,294 |
| Average LGD in % | 50.11 | 72.14 | 33.12 | 25.25 | 22.45 | 23.54 | 44.91 | 17.57 | 44.79 |
| Average PD in % | 0.00 | 4.12 | 4.58 | 0.65 | 4.60 | 0.60 | 0.51 | 91.02 | 7.09 |
| United States of America | | | | | | | | | |
| EAD net | 88,374 | 6,129 | 69,242 | 1 | 68 | 6 | 12 | 234 | 164,066 |
| Average LGD in % | 50.03 | 46.39 | 21.43 | 16.03 | 26.38 | 21.59 | 41.98 | 46.23 | 37.81 |
| Average PD in % | 0.00 | 0.70 | 2.99 | 0.39 | 1.75 | 0.62 | 4.33 | 0.36 | 1.29 |
| Vietnam | | | | | | | | | |
| EAD net | 66 | 0 | 320 | 0 | 1 | 0 | 0 | 0 | 388 |
| Average LGD in % | 50.00 | N/M | 40.77 | N/M | 19.59 | 30.36 | N/M | 35.67 | 42.27 |
| Average PD in % | 1.07 | N/M | 1.90 | N/M | 0.53 | 2.19 | N/M | 2.52 | 1.75 |
| Other | | | | | | | | | |
| EAD net | 1,368 | 373 | 19,136 | 4 | 78 | 12 | 15 | 187 | 21,174 |
| Average LGD in % | 48.56 | 44.57 | 18.03 | 12.73 | 17.50 | 27.44 | 46.39 | 14.45 | 20.46 |
| Average PD in % | 2.61 | 4.55 | 3.99 | 0.42 | 4.48 | 1.88 | 6.94 | 3.86 | 3.91 |
| of which: | | | | | | | | | |
| International Organizations | | | | | | | | | |

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| in € m. (unless stated otherwise) | Central govern- ments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---|---------------|----------------|--|--|-----------------------------------|------------------------|----------------------------|----------------------------|
| EAD net | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 300 |
| Average LGD in % | 53.92 | N/M | 57.08 | N/M | N/M | N/M | N/M | N/M | 53.93 |
| Average PD in % | 0.01 | N/M | 1.01 | N/M | N/M | N/M | N/M | N/M | 0.01 |
| Total | 124,865¹ | 25,551 | 232,339 | 9,167 | 155,768 | 12,126 | 5,708 | 30,571 | 596,094¹ |

¹ Includes exposures subject to deferred tax assets that rely on future profitability and arise from temporary differences which are subject to the threshold exemptions as outlined in Article 48 CRR.

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| in € m. (unless stated otherwise) | Central governments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---|--------------|------------|--|--|-----------------------------------|------------------------|----------------------------|---------|
| Australia | | | | | | | | | |
| EAD net | 782 | 353 | 1,633 | 2 | 7 | 1 | 0 | 2 | 2,778 |
| Average LGD in % | 35.78 | 45.83 | 28.13 | 29.89 | 17.24 | 22.48 | N/M | 25.84 | 32.50 |
| Average PD in % | 0.02 | 0.05 | 16.63 | 0.39 | 3.76 | 0.45 | N/M | 3.95 | 9.80 |
| Austria | | | | | | | | | |
| EAD net | 118 | 105 | 689 | 7 | 44 | 8 | 3 | 9 | 983 |
| Average LGD in % | 50.00 | 16.13 | 33.66 | 8.59 | 12.88 | 12.35 | 42.62 | 25.25 | 32.43 |
| Average PD in % | 0.00 | 0.11 | 2.44 | 0.61 | 2.12 | 0.74 | 0.65 | 5.34 | 1.88 |
| Belgium | | | | | | | | | |
| EAD net | 632 | 938 | 1,397 | 1 | 33 | 4 | 2 | 8 | 3,015 |
| Average LGD in % | 50.53 | 47.89 | 28.37 | 10.90 | 16.78 | 12.45 | 42.53 | 30.06 | 38.95 |
| Average PD in % | 0.00 | 0.04 | 11.47 | 1.47 | 3.50 | 0.83 | 0.59 | 3.88 | 5.38 |
| Brazil | | | | | | | | | |
| EAD net | 223 | 396 | 530 | 0 | 7 | 1 | 1 | 11 | 1,168 |
| Average LGD in % | 50.00 | 30.18 | 41.74 | N/M | 14.43 | 25.12 | 42.04 | 7.48 | 38.90 |
| Average PD in % | 0.64 | 1.16 | 5.38 | N/M | 2.35 | 0.75 | 0.61 | 1.09 | 2.98 |
| Canada | | | | | | | | | |
| EAD net | 35 | 1,028 | 1,150 | 0 | 5 | 1 | 2 | 10 | 2,229 |
| Average LGD in % | 41.07 | 35.29 | 34.21 | N/M | 13.50 | 23.17 | 42.68 | 10.37 | 34.66 |
| Average PD in % | 0.02 | 0.09 | 5.85 | N/M | 2.26 | 0.95 | 0.46 | 11.44 | 3.11 |
| China | | | | | | | | | |
| EAD net | 1,921 | 3,005 | 3,688 | 0 | 20 | 2 | 3 | 5 | 8,643 |
| Average LGD in % | 50.90 | 39.89 | 39.99 | N/M | 14.36 | 23.35 | 46.51 | 36.24 | 42.32 |
| Average PD in % | 0.00 | 0.16 | 1.01 | N/M | 1.21 | 0.62 | 0.54 | 2.98 | 0.49 |
| Czech Republic | | | | | | | | | |
| EAD net | 687 | 194 | 113 | 0 | 4 | 1 | 2 | 3 | 1,005 |
| Average LGD in % | 50.00 | 44.60 | 45.89 | N/M | 18.18 | 12.93 | 42.69 | 50.05 | 48.30 |
| Average PD in % | 0.00 | 0.08 | 0.43 | N/M | 0.72 | 1.64 | 0.51 | 22.02 | 0.13 |
| France | | | | | | | | | |
| EAD net | 815 | 921 | 4,845 | 3 | 65 | 10 | 6 | 80 | 6,745 |
| Average LGD in % | 50.76 | 31.71 | 37.75 | 7.17 | 14.35 | 14.82 | 42.89 | 16.34 | 37.97 |
| Average PD in % | 0.00 | 0.21 | 0.90 | 1.82 | 4.90 | 1.29 | 0.63 | 6.11 | 0.80 |
| Germany | | | | | | | | | |
| EAD net | 5,818 | 2,624 | 38,107 | 9,131 | 133,460 | 12,341 | 2,618 | 18,751 | 222,849 |
| Average LGD in % | 82.85 | 23.40 | 35.81 | 10.33 | 13.27 | 11.29 | 31.63 | 41.29 | 21.54 |
| Average PD in % | 1.16 | 1.01 | 3.59 | 2.07 | 2.10 | 0.92 | 2.02 | 6.22 | 2.60 |
| Greece | | | | | | | | | |
| EAD net | 0 | 4 | 893 | 0 | 4 | 1 | 0 | 3 | 905 |
| Average LGD in % | N/M | 20.87 | 11.20 | N/M | 15.93 | 22.57 | 25.72 | 21.15 | 11.31 |
| Average PD in % | N/M | 31.00 | 34.25 | N/M | 1.15 | 2.59 | 0.24 | 2.86 | 33.93 |
| Hong Kong | | | | | | | | | |
| EAD net | 304 | 317 | 5,179 | 0 | 10 | 1 | 0 | 1 | 5,811 |
| Average LGD in % | 30.00 | 40.95 | 33.50 | 3.66 | 27.12 | 27.77 | 31.90 | 21.86 | 33.71 |
| Average PD in % | 0.02 | 0.06 | 1.04 | 0.39 | 1.02 | 0.27 | 0.39 | 0.43 | 0.93 |
| Hungary | | | | | | | | | |
| EAD net | 197 | 2 | 84 | 0 | 3 | 1 | 0 | 3 | 290 |
| Average LGD in % | 50.00 | 0.84 | 47.62 | N/M | 20.92 | 14.82 | 31.90 | 45.28 | 48.43 |
| Average PD in % | 0.14 | 0.39 | 0.18 | N/M | 1.31 | 4.71 | 0.23 | 13.74 | 0.31 |
| India | | | | | | | | | |
| EAD net | 1,977 | 1,833 | 5,472 | 0 | 2 | 1 | 0 | 13 | 9,299 |
| Average LGD in % | 49.37 | 31.66 | 41.09 | N/M | 18.04 | 31.17 | 1.27 | 38.83 | 40.98 |
| Average PD in % | 0.40 | 0.51 | 5.14 | N/M | 0.44 | 1.80 | 0.63 | 1.97 | 3.21 |
| Indonesia | | | | | | | | | |
| EAD net | 718 | 0 | 1,303 | 0 | 0 | 0 | 0 | 1 | 2,023 |
| Average LGD in % | 56.86 | N/M | 41.12 | N/M | 15.22 | 25.70 | N/M | 48.68 | 46.70 |
| Average PD in % | 0.44 | N/M | 2.79 | N/M | 0.87 | 2.47 | N/M | 1.63 | 1.95 |
| Ireland | | | | | | | | | |
| EAD net | 0 | 154 | 4,188 | 0 | 26 | 0 | 0 | 2 | 4,369 |
| Average LGD in % | N/M | 27.72 | 15.60 | N/M | 17.41 | 24.44 | 32.93 | 13.86 | 16.03 |
| Average PD in % | N/M | 42.38 | 21.72 | N/M | 8.06 | 1.82 | 2.16 | 3.86 | 22.36 |
| Israel | | | | | | | | | |
| EAD net | 0 | 0 | 214 | 3 | 13 | 1 | 0 | 0 | 231 |
| Average LGD in % | N/M | N/M | 38.71 | 42.00 | 27.38 | 24.31 | 31.90 | 17.80 | 38.05 |
| Average PD in % | N/M | N/M | 1.15 | 0.23 | 8.56 | 1.12 | 0.23 | 3.60 | 1.56 |
| Italy (incl. San Marino) | | | | | | | | | |
| EAD net | 732 | 192 | 6,418 | 107 | 7,987 | 51 | 1,201 | 6,062 | 22,750 |
| Average LGD in % | 50.06 | 28.90 | 40.52 | 26.62 | 12.14 | 66.65 | 62.12 | 57.84 | 36.52 |

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| in € m. (unless stated otherwise) | Central governments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---------------------------------------|--------------|------------|-----------------------------------|---------------------------------------|-----------------------------|------------------|----------------------|--------|
| Average PD in % | 0.09 | 5.95 | 9.56 | 18.62 | 4.57 | 4.86 | 7.38 | 12.16 | 8.08 |
| Japan | | | | | | | | | |
| EAD net | 5,728 | 251 | 1,018 | 0 | 8 | 1 | 0 | 0 | 7,006 |
| Average LGD in % | 50.00 | 38.62 | 26.24 | N/M | 18.54 | 22.01 | 42.69 | 35.16 | 46.10 |
| Average PD in % | 0.00 | 0.29 | 1.35 | N/M | 0.58 | 0.22 | 0.81 | 2.27 | 0.21 |
| Jersey | | | | | | | | | |
| EAD net | 0 | 0 | 1,096 | 0 | 0 | 0 | 0 | 0 | 1,096 |
| Average LGD in % | N/M | N/M | 18.63 | N/M | N/M | N/M | N/M | 23.62 | 18.63 |
| Average PD in % | N/M | N/M | 6.79 | N/M | N/M | N/M | N/M | 57.12 | 6.79 |
| Luxembourg | | | | | | | | | |
| EAD net | 467 | 700 | 6,243 | 15 | 25 | 1 | 0 | 2 | 7,453 |
| Average LGD in % | 50.00 | 49.37 | 18.04 | 17.80 | 13.66 | 16.16 | 48.51 | 36.29 | 22.97 |
| Average PD in % | 0.00 | 0.04 | 3.83 | 0.84 | 3.39 | 0.20 | 0.34 | 3.49 | 3.22 |
| Malaysia | | | | | | | | | |
| EAD net | 656 | 0 | 712 | 0 | 1 | 0 | 0 | 1 | 1,370 |
| Average LGD in % | 50.00 | N/M | 44.92 | N/M | 19.15 | 23.15 | N/M | 47.12 | 47.33 |
| Average PD in % | 0.07 | N/M | 0.35 | N/M | 0.55 | 0.25 | N/M | 1.15 | 0.22 |
| Malta | | | | | | | | | |
| EAD net | 4 | 13 | 139 | 0 | 1 | 0 | 0 | 0 | 157 |
| Average LGD in % | 50.00 | 33.89 | 5.32 | N/M | 26.14 | 25.30 | N/M | 70.82 | 8.94 |
| Average PD in % | 0.05 | 0.33 | 4.25 | N/M | 2.32 | 1.59 | N/M | 45.28 | 3.84 |
| Mauritius | | | | | | | | | |
| EAD net | 0 | 0 | 274 | 0 | 1 | 0 | 0 | 0 | 274 |
| Average LGD in % | N/M | N/M | 44.53 | N/M | 17.42 | 29.86 | N/M | 47.26 | 44.47 |
| Average PD in % | N/M | N/M | 18.02 | N/M | 2.57 | 2.04 | N/M | 1.20 | 17.98 |
| Mexico | | | | | | | | | |
| EAD net | 151 | 43 | 509 | 0 | 4 | 1 | 0 | 8 | 716 |
| Average LGD in % | 50.00 | 25.29 | 43.26 | N/M | 14.54 | 27.34 | 42.73 | 19.34 | 43.18 |
| Average PD in % | 0.09 | 0.28 | 0.73 | N/M | 1.95 | 0.64 | 3.64 | 1.15 | 0.58 |
| Netherlands | | | | | | | | | |
| EAD net | 90 | 563 | 10,358 | 3 | 88 | 4 | 6 | 38 | 11,151 |
| Average LGD in % | 49.94 | 36.05 | 23.43 | 9.01 | 14.96 | 17.24 | 40.96 | 7.72 | 24.16 |
| Average PD in % | 0.00 | 0.15 | 6.36 | 1.24 | 2.50 | 1.40 | 3.96 | 1.51 | 5.94 |
| New Zealand | | | | | | | | | |
| EAD net | 0 | 8 | 87 | 0 | 2 | 0 | 0 | 0 | 97 |
| Average LGD in % | N/M | 45.00 | 43.81 | N/M | 10.48 | 23.29 | 31.90 | 23.36 | 43.22 |
| Average PD in % | N/M | 0.04 | 0.92 | N/M | 0.37 | 0.14 | 98.21 | 0.50 | 0.85 |
| Pakistan | | | | | | | | | |
| EAD net | 43 | 0 | 104 | 0 | 1 | 0 | 0 | 1 | 149 |
| Average LGD in % | 50.00 | N/M | 39.11 | N/M | 12.70 | 32.86 | N/M | 46.77 | 42.19 |
| Average PD in % | 7.95 | N/M | 2.68 | N/M | 0.45 | 3.32 | N/M | 3.26 | 4.20 |
| Philippines | | | | | | | | | |
| EAD net | 126 | 0 | 458 | 0 | 1 | 0 | 0 | 0 | 585 |
| Average LGD in % | 50.00 | N/M | 41.24 | N/M | 10.43 | 16.67 | 43.58 | 45.39 | 43.08 |
| Average PD in % | 0.14 | N/M | 0.29 | N/M | 0.25 | 1.29 | 0.66 | 3.61 | 0.26 |
| Poland | | | | | | | | | |
| EAD net | 2,060 | 1 | 1,978 | 92 | 4,842 | 2 | 104 | 414 | 9,494 |
| Average LGD in % | 50.00 | 36.18 | 38.80 | 20.58 | 21.31 | 15.89 | 71.26 | 67.57 | 33.74 |
| Average PD in % | 0.05 | 0.39 | 4.70 | 3.25 | 2.02 | 8.53 | 13.19 | 11.45 | 2.70 |
| Portugal | | | | | | | | | |
| EAD net | 0 | 17 | 415 | 37 | 1,252 | 1 | 72 | 711 | 2,503 |
| Average LGD in % | N/M | 14.20 | 28.80 | 7.64 | 7.65 | 18.33 | 33.18 | 11.91 | 13.14 |
| Average PD in % | N/M | 8.52 | 6.74 | 5.51 | 4.43 | 1.42 | 9.55 | 8.40 | 6.13 |
| Romania | | | | | | | | | |
| EAD net | 0 | 16 | 27 | 0 | 1 | 0 | 1 | 2 | 46 |
| Average LGD in % | N/M | 45.15 | 51.03 | N/M | 5.70 | 24.37 | 42.69 | 58.09 | 48.37 |
| Average PD in % | N/M | 2.16 | 0.12 | N/M | 0.25 | 7.63 | 0.57 | 33.35 | 2.03 |
| Russian Federation | | | | | | | | | |
| EAD net | 602 | 0 | 632 | 0 | 29 | 1 | 1 | 7 | 1,272 |
| Average LGD in % | 50.00 | N/M | 45.55 | N/M | 20.76 | 30.82 | 43.33 | 20.15 | 46.94 |
| Average PD in % | 0.39 | N/M | 0.50 | N/M | 2.87 | 2.77 | 0.26 | 5.91 | 0.53 |
| Saudi Arabia | | | | | | | | | |
| EAD net | 315 | 1,023 | 940 | 0 | 3 | 0 | 0 | 1 | 2,283 |
| Average LGD in % | 50.00 | 19.44 | 32.62 | N/M | 28.40 | 28.83 | 42.69 | 37.90 | 29.11 |
| Average PD in % | 0.05 | 0.10 | 1.30 | N/M | 0.77 | 1.83 | 0.53 | 1.53 | 0.59 |
| Singapore | | | | | | | | | |
| EAD net | 1,443 | 181 | 5,868 | 0 | 17 | 1 | 1 | 3 | 7,513 |

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| in € m. (unless stated otherwise) | Central governments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---------------------------------------|--------------|------------|-----------------------------------|---------------------------------------|-----------------------------|------------------|----------------------|---------|
| Average LGD in % | 50.00 | 42.41 | 18.08 | N/M | 15.09 | 22.36 | 42.56 | 17.75 | 24.79 |
| Average PD in % | 0.00 | 0.04 | 1.08 | N/M | 0.47 | 0.30 | 0.33 | 0.30 | 0.85 |
| South Africa | | | | | | | | | |
| EAD net | 43 | 222 | 174 | 0 | 5 | 1 | 0 | 5 | 449 |
| Average LGD in % | 50.00 | 49.48 | 46.20 | N/M | 15.94 | 23.04 | 42.69 | 29.10 | 47.65 |
| Average PD in % | 0.14 | 0.22 | 2.95 | N/M | 1.85 | 0.86 | 0.67 | 0.87 | 1.29 |
| South Korea | | | | | | | | | |
| EAD net | 1,529 | 0 | 1,621 | 0 | 4 | 0 | 0 | 0 | 3,154 |
| Average LGD in % | 50.18 | N/M | 43.68 | N/M | 32.75 | 24.93 | N/M | 45.10 | 46.81 |
| Average PD in % | 0.00 | N/M | 0.33 | N/M | 0.51 | 0.69 | N/M | 1.47 | 0.17 |
| Spain | | | | | | | | | |
| EAD net | 235 | 382 | 4,926 | 126 | 7,011 | 6 | 1,357 | 1,284 | 15,327 |
| Average LGD in % | 47.41 | 31.36 | 41.39 | 26.29 | 12.36 | 29.86 | 74.80 | 65.24 | 32.78 |
| Average PD in % | 2.78 | 0.19 | 10.63 | 20.52 | 3.67 | 1.79 | 5.17 | 7.52 | 6.40 |
| Sri Lanka | | | | | | | | | |
| EAD net | 95 | 0 | 102 | 0 | 0 | 0 | 0 | 0 | 197 |
| Average LGD in % | 50.00 | N/M | 46.37 | N/M | 26.20 | 22.38 | N/M | 46.64 | 48.11 |
| Average PD in % | 2.92 | N/M | 1.82 | N/M | 0.23 | 7.90 | N/M | 6.17 | 2.35 |
| Sweden | | | | | | | | | |
| EAD net | 0 | 417 | 682 | 0 | 17 | 1 | 1 | 1 | 1,120 |
| Average LGD in % | N/M | 26.19 | 33.75 | N/M | 24.72 | 16.11 | 48.40 | 49.82 | 30.81 |
| Average PD in % | N/M | 0.07 | 0.64 | N/M | 1.80 | 1.00 | 0.50 | 6.95 | 0.45 |
| Switzerland | | | | | | | | | |
| EAD net | 3,306 | 507 | 9,151 | 6 | 184 | 16 | 5 | 36 | 13,209 |
| Average LGD in % | 49.98 | 32.65 | 22.22 | 6.32 | 13.75 | 17.41 | 39.69 | 16.71 | 29.43 |
| Average PD in % | 0.00 | 0.06 | 4.32 | 0.63 | 3.64 | 0.84 | 0.51 | 4.54 | 3.06 |
| Taiwan | | | | | | | | | |
| EAD net | 600 | 0 | 809 | 0 | 2 | 0 | 0 | 8 | 1,420 |
| Average LGD in % | 50.00 | N/M | 33.70 | N/M | 5.78 | 24.89 | 42.69 | 49.50 | 40.63 |
| Average PD in % | 0.00 | N/M | 0.13 | N/M | 0.99 | 0.34 | 0.30 | 0.52 | 0.08 |
| Thailand | | | | | | | | | |
| EAD net | 729 | 0 | 1,022 | 0 | 1 | 1 | 0 | 1 | 1,755 |
| Average LGD in % | 50.00 | N/M | 42.29 | N/M | 16.11 | 15.82 | 42.65 | 31.37 | 45.46 |
| Average PD in % | 0.09 | N/M | 0.42 | N/M | 0.91 | 0.87 | 0.41 | 4.18 | 0.28 |
| Turkey | | | | | | | | | |
| EAD net | 111 | 1,405 | 510 | 0 | 4 | 1 | 0 | 2 | 2,033 |
| Average LGD in % | 50.00 | 12.28 | 47.02 | N/M | 18.42 | 24.89 | 42.03 | 34.82 | 23.09 |
| Average PD in % | 0.39 | 0.41 | 4.90 | N/M | 12.17 | 3.09 | 0.19 | 6.42 | 1.57 |
| Ukraine | | | | | | | | | |
| EAD net | 34 | 0 | 59 | 0 | 5 | 0 | 0 | 0 | 98 |
| Average LGD in % | 50.00 | N/M | 25.88 | N/M | 9.77 | 31.32 | N/M | 46.94 | 33.50 |
| Average PD in % | 7.95 | N/M | 65.02 | N/M | 0.37 | 0.96 | N/M | 0.00 | 41.83 |
| United Arab Emirates | | | | | | | | | |
| EAD net | 122 | 0 | 980 | 0 | 14 | 1 | 0 | 14 | 1,131 |
| Average LGD in % | 50.00 | N/M | 27.76 | 25.60 | 19.80 | 26.00 | N/M | 38.48 | 30.19 |
| Average PD in % | 0.00 | N/M | 4.12 | 0.23 | 2.99 | 1.28 | N/M | 0.65 | 3.62 |
| United Kingdom | | | | | | | | | |
| EAD net | 394 | 4,614 | 7,854 | 1 | 165 | 5 | 5 | 399 | 13,436 |
| Average LGD in % | 50.00 | 75.87 | 34.75 | 7.23 | 15.06 | 23.85 | 44.50 | 15.83 | 48.51 |
| Average PD in % | 0.00 | 0.12 | 8.89 | 0.49 | 5.09 | 0.71 | 0.53 | 90.39 | 7.99 |
| United States of America | | | | | | | | | |
| EAD net | 88,458 | 4,901 | 65,862 | 1 | 71 | 6 | 7 | 711 | 160,017 |
| Average LGD in % | 49.85 | 41.26 | 22.63 | 13.96 | 25.84 | 20.24 | 40.21 | 48.26 | 38.37 |
| Average PD in % | 0.00 | 0.59 | 3.47 | 0.43 | 2.88 | 0.34 | 0.79 | 0.12 | 1.45 |
| Vietnam | | | | | | | | | |
| EAD net | 95 | 0 | 128 | 0 | 1 | 0 | 0 | 0 | 225 |
| Average LGD in % | 50.00 | N/M | 40.07 | N/M | 19.84 | 27.79 | N/M | 26.11 | 44.13 |
| Average PD in % | 1.07 | N/M | 1.55 | N/M | 5.68 | 1.07 | N/M | 2.47 | 1.37 |
| Other | | | | | | | | | |
| EAD net | 906 | 386 | 16,098 | 4 | 83 | 11 | 13 | 174 | 17,675 |
| Average LGD in % | 49.59 | 29.54 | 16.19 | 5.32 | 16.83 | 25.71 | 54.91 | 14.47 | 23.16 |
| Average PD in % | 1.90 | 11.42 | 4.90 | 3.02 | 4.91 | 2.08 | 1.14 | 6.08 | 6.74 |
| of which: | | | | | | | | | |
| International Organizations | | | | | | | | | |
| EAD net | 328 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 328 |
| Average LGD in % | 51.77 | N/M | 56.01 | N/M | N/M | N/M | N/M | N/M | 51.78 |
| Average PD in % | 0.01 | N/M | 0.88 | N/M | N/M | N/M | N/M | N/M | 0.01 |

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| in € m. (unless stated otherwise) | Central govern- ments and central banks | Institutions | Corporates | Retail secured by real estate SME | Retail secured by real estate non-SME | Retail qualifying revolving | Retail other SME | Retail other non-SME | Total |
|--------------------------------------|---|--------------|------------|--|--|-----------------------------------|------------------------|----------------------------|----------------------|
| Total | 123,297 ¹ | 27,714 | 216,737 | 9,538 | 155,533 | 12,489 | 5,417 | 28,784 | 579,509 ¹ |

¹ Includes exposures subject to deferred tax assets that rely on future profitability and arise from temporary differences which are subject to the threshold exemptions as outlined in Article 48 CRR.

Foundation IRBA

The table below shows our Foundation IRBA exposure for credit risk distributed based on the corresponding exposure classes for each relevant geographical location. As geographical location we show countries where the Bank maintains a branch or subsidiary. Exposure which does not meet these criteria is shown in "Other", which also comprises exposure to international organizations. Exposures are assigned to the specific geographical location based on the country of domicile of the respective counterparty. The EAD net is presented in conjunction with exposures-weighted average PD in percentage.

EAD net and average PD of Foundation IRBA credit exposures by geographical location

| in € m. (unless stated otherwise) | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|--------------------------------------|---------------------------------------|--------------|------------|-------|---------------------------------------|--------------|------------|-------|
| | Central governments and central banks | Institutions | Corporates | Total | Central governments and central banks | Institutions | Corporates | Total |
| Australia | | | | | | | | |
| EAD net | 0 | 0 | 5 | 5 | 0 | 0 | 4 | 4 |
| Average PD in % | N/M | N/M | 0.27 | 0.27 | N/M | N/M | 0.25 | 0.25 |
| Austria | | | | | | | | |
| EAD net | 0 | 0 | 374 | 374 | 0 | 0 | 367 | 367 |
| Average PD in % | N/M | 0.11 | 0.40 | 0.40 | N/M | 0.23 | 0.17 | 0.17 |
| Belgium | | | | | | | | |
| EAD net | 0 | 0 | 105 | 105 | 0 | 0 | 98 | 98 |
| Average PD in % | N/M | N/M | 0.17 | 0.17 | N/M | N/M | 0.11 | 0.11 |
| Brazil | | | | | | | | |
| EAD net | 0 | 0 | 16 | 16 | 0 | 0 | 13 | 13 |
| Average PD in % | N/M | N/M | 1.62 | 1.62 | N/M | N/M | 0.24 | 0.24 |
| Canada | | | | | | | | |
| EAD net | 0 | 0 | 25 | 25 | 0 | 0 | 14 | 14 |
| Average PD in % | N/M | N/M | 0.07 | 0.07 | N/M | N/M | 0.14 | 0.14 |
| China | | | | | | | | |
| EAD net | 0 | 0 | 42 | 42 | 0 | 0 | 12 | 12 |
| Average PD in % | N/M | N/M | 0.30 | 0.30 | N/M | N/M | 0.19 | 0.19 |
| Czech Republic | | | | | | | | |
| EAD net | 0 | 0 | 47 | 47 | 0 | 0 | 36 | 36 |
| Average PD in % | N/M | N/M | 0.20 | 0.20 | N/M | N/M | 0.19 | 0.19 |
| France | | | | | | | | |
| EAD net | 0 | 0 | 261 | 261 | 0 | 0 | 225 | 225 |
| Average PD in % | N/M | N/M | 0.28 | 0.28 | N/M | N/M | 0.20 | 0.20 |
| Germany | | | | | | | | |
| EAD net | 17 | 1 | 6,335 | 6,353 | 0 | 1 | 5,878 | 5,879 |
| Average PD in % | 0.00 | 0.09 | 1.33 | 1.33 | N/M | 0.20 | 1.05 | 1.05 |
| Greece | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | N/M | N/M | N/M | N/M | N/M | N/M |
| Hong Kong | | | | | | | | |
| EAD net | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| Average PD in % | N/M | N/M | 0.17 | 0.17 | N/M | N/M | 0.15 | 0.15 |
| Hungary | | | | | | | | |
| EAD net | 0 | 0 | 82 | 82 | 0 | 0 | 46 | 46 |
| Average PD in % | N/M | N/M | 0.11 | 0.11 | N/M | N/M | 0.14 | 0.14 |
| India | | | | | | | | |
| EAD net | 0 | 0 | 57 | 57 | 0 | 0 | 21 | 21 |
| Average PD in % | N/M | N/M | 2.06 | 2.06 | N/M | N/M | 5.14 | 5.14 |
| Indonesia | | | | | | | | |
| EAD net | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| Average PD in % | N/M | N/M | 0.06 | 0.06 | N/M | N/M | 0.42 | 0.42 |
| Ireland | | | | | | | | |
| EAD net | 0 | 0 | 20 | 20 | 0 | 0 | 16 | 16 |
| Average PD in % | N/M | N/M | 0.21 | 0.21 | N/M | N/M | 0.53 | 0.53 |
| Israel | | | | | | | | |
| EAD net | 0 | 0 | 4 | 4 | 0 | 0 | 2 | 2 |
| Average PD in % | N/M | N/M | 0.28 | 0.28 | N/M | N/M | 0.14 | 0.14 |
| Italy | | | | | | | | |
| EAD net | 0 | 0 | 180 | 180 | 0 | 0 | 186 | 186 |
| Average PD in % | N/M | N/M | 0.80 | 0.80 | N/M | N/M | 0.24 | 0.24 |
| Japan | | | | | | | | |
| EAD net | 0 | 0 | 6 | 6 | 0 | 0 | 8 | 8 |
| Average PD in % | N/M | N/M | 0.15 | 0.15 | N/M | N/M | 0.39 | 0.39 |
| Jersey | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | N/M | N/M | N/M | N/M | N/M | N/M |
| Luxembourg | | | | | | | | |
| EAD net | 0 | 0 | 61 | 62 | 0 | 0 | 46 | 46 |
| Average PD in % | N/M | 20.00 | 0.14 | 0.25 | N/M | N/M | 0.20 | 0.20 |
| Malaysia | | | | | | | | |
| EAD net | 0 | 0 | 5 | 5 | 0 | 0 | 5 | 5 |
| Average PD in % | N/M | N/M | 0.22 | 0.22 | N/M | N/M | 0.24 | 0.24 |
| Malta | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | 0.17 | 0.17 | N/M | N/M | 0.10 | 0.10 |

| in € m. (unless stated otherwise) | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|--------------------------------------|---------------------------------------|--------------|------------|-------|---------------------------------------|--------------|------------|-------|
| | Central governments and central banks | Institutions | Corporates | Total | Central governments and central banks | Institutions | Corporates | Total |
| Mauritius | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | 0.20 | 0.20 | N/M | N/M | N/M | N/M |
| Mexico | | | | | | | | |
| EAD net | 0 | 0 | 9 | 9 | 0 | 0 | 5 | 5 |
| Average PD in % | N/M | N/M | 3.08 | 3.08 | N/M | N/M | 0.14 | 0.14 |
| Netherlands | | | | | | | | |
| EAD net | 0 | 0 | 175 | 175 | 0 | 0 | 174 | 174 |
| Average PD in % | N/M | N/M | 0.40 | 0.40 | N/M | N/M | 0.27 | 0.27 |
| New Zealand | | | | | | | | |
| EAD net | 0 | 0 | 4 | 4 | 0 | 0 | 2 | 2 |
| Average PD in % | N/M | N/M | 0.23 | 0.23 | N/M | N/M | 0.21 | 0.21 |
| Pakistan | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | N/M | N/M | N/M | N/M | N/M | N/M |
| Philippines | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | 0.03 | 0.03 | N/M | N/M | 0.03 | 0.03 |
| Poland | | | | | | | | |
| EAD net | 0 | 0 | 120 | 120 | 0 | 0 | 55 | 55 |
| Average PD in % | N/M | N/M | 0.58 | 0.58 | N/M | N/M | 0.15 | 0.15 |
| Portugal | | | | | | | | |
| EAD net | 0 | 0 | 17 | 17 | 0 | 0 | 17 | 17 |
| Average PD in % | N/M | N/M | 0.17 | 0.17 | N/M | N/M | 0.17 | 0.17 |
| Romania | | | | | | | | |
| EAD net | 0 | 0 | 33 | 33 | 0 | 0 | 11 | 11 |
| Average PD in % | N/M | N/M | 0.15 | 0.15 | N/M | N/M | 0.20 | 0.20 |
| Russian Federation | | | | | | | | |
| EAD net | 0 | 0 | 74 | 74 | 0 | 0 | 8 | 8 |
| Average PD in % | N/M | N/M | 1.96 | 1.96 | N/M | N/M | 2.68 | 2.68 |
| Saudi Arabia | | | | | | | | |
| EAD net | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | 0.15 | 0.15 | N/M | N/M | 0.12 | 0.12 |
| Singapore | | | | | | | | |
| EAD net | 0 | 0 | 6 | 6 | 0 | 0 | 4 | 4 |
| Average PD in % | N/M | N/M | 0.43 | 0.43 | N/M | N/M | 0.18 | 0.18 |
| South Africa | | | | | | | | |
| EAD net | 0 | 0 | 1 | 1 | 0 | 0 | 4 | 4 |
| Average PD in % | N/M | N/M | 0.18 | 0.18 | N/M | N/M | 0.16 | 0.16 |
| South Korea | | | | | | | | |
| EAD net | 0 | 0 | 4 | 4 | 0 | 0 | 5 | 5 |
| Average PD in % | N/M | N/M | 0.35 | 0.35 | N/M | N/M | 0.31 | 0.31 |
| Spain | | | | | | | | |
| EAD net | 0 | 0 | 127 | 127 | 0 | 0 | 115 | 115 |
| Average PD in % | N/M | N/M | 0.36 | 0.36 | N/M | N/M | 0.19 | 0.19 |
| Sri-Lanka | | | | | | | | |
| EAD net | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | N/M | N/M | N/M | N/M | N/M | N/M |
| Sweden | | | | | | | | |
| EAD net | 0 | 0 | 41 | 41 | 0 | 0 | 28 | 28 |
| Average PD in % | N/M | N/M | 0.20 | 0.20 | N/M | N/M | 0.14 | 0.14 |
| Switzerland | | | | | | | | |
| EAD net | 0 | 0 | 206 | 206 | 0 | 0 | 159 | 159 |
| Average PD in % | N/M | N/M | 0.23 | 0.23 | N/M | N/M | 0.50 | 0.50 |
| Taiwan | | | | | | | | |
| EAD net | 0 | 0 | 3 | 3 | 0 | 0 | 5 | 5 |
| Average PD in % | N/M | N/M | 0.22 | 0.22 | N/M | N/M | 0.17 | 0.17 |
| Thailand | | | | | | | | |
| EAD net | 0 | 0 | 13 | 13 | 0 | 0 | 3 | 3 |
| Average PD in % | N/M | N/M | 0.16 | 0.16 | N/M | N/M | 0.16 | 0.16 |
| Turkey | | | | | | | | |
| EAD net | 0 | 0 | 8 | 8 | 0 | 0 | 10 | 10 |
| Average PD in % | N/M | N/M | 0.24 | 0.24 | N/M | N/M | 0.26 | 0.26 |
| Ukraine | | | | | | | | |
| EAD net | 0 | 0 | 6 | 6 | 0 | 0 | 3 | 3 |
| Average PD in % | N/M | N/M | 1.63 | 1.63 | N/M | N/M | 5.88 | 5.88 |
| United Arab Emirates | | | | | | | | |
| EAD net | 0 | 0 | 6 | 6 | 0 | 0 | 3 | 3 |

| | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|--------------------------------------|--|--------------|--------------|--------------|--|--------------|--------------|--------------|
| in € m. (unless stated otherwise) | Central governments and central banks | Institutions | Corporates | Total | Central governments and central banks | Institutions | Corporates | Total |
| Average PD in % | N/M | N/M | 8.64 | 8.64 | N/M | N/M | 0.27 | 0.27 |
| United Kingdom | | | | | | | | |
| EAD net | 0 | 0 | 258 | 258 | 0 | 0 | 253 | 253 |
| Average PD in % | N/M | N/M | 0.34 | 0.34 | N/M | N/M | 0.52 | 0.52 |
| United States of America | | | | | | | | |
| EAD net | 0 | 0 | 223 | 223 | 0 | 0 | 104 | 104 |
| Average PD in % | N/M | N/M | 1.03 | 1.03 | N/M | N/M | 0.42 | 0.42 |
| Vietnam | | | | | | | | |
| EAD net | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | 9.96 | 9.96 | N/M | N/M | 0.36 | 0.36 |
| Other | | | | | | | | |
| EAD | 0 | 15 | 246 | 261 | 0 | 0 | 146 | 146 |
| Average PD in % | N/M | 20.00 | 2.16 | 3.19 | N/M | N/M | 2.32 | 2.32 |
| of which: | | | | | | | | |
| International Organizations | | | | | | | | |
| EAD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average PD in % | N/M | N/M | N/M | N/M | N/M | N/M | N/M | N/M |
| Total | 17 | 16 | 9,218 | 9,251 | 0 | 1 | 8,095 | 8,096 |

Counterparty credit risk (CCR)

Article 439 (a) CRR - Internal capital and credit limits for counterparty credit risk exposures

Counterparty credit exposure (CCR) arises from our business activities in derivatives and securities financing transactions (SFT), it is the risk that the counterparty to a transaction may default before completing the satisfactory settlement of the transaction. We calculate the exposure to CCR using the internal model method (IMM) and the mark-to-market method (CEM) for derivatives and the financial collateral comprehensive method for SFT respectively.

As the replacement values of derivatives portfolios fluctuate with movements in market rates and with changes in the transactions in the portfolios, we estimate the potential future replacement costs of the portfolios over their lifetimes or, in case of collateralized portfolios, over appropriate unwind periods. We measure the potential future exposure against a limit set for the counterparty for this type of transactions.

Limits for CCR exposures are established on the basis of the principles for assigning credit limits as described in the sections "Credit risk framework" and "Measuring credit risk" in the Annual Report 2018 on pages 62. For the purpose of limit setting, CCR exposures are also considered in the context of the overall credit exposure to the obligor and the group of borrowers under the one obligor principle.

We supplement the potential future exposure analysis with stress tests to estimate the immediate impact of extreme market events on our exposures (such as event risk in our Emerging Markets portfolio).

For the majority of derivative counterparty exposures as well as for SFT, we (without former Postbank, now part of DB Privat- und Firmenkundenbank AG (DB PFK AG)) make use of the internal model method in accordance with Article 283 et seq. CRR. In this respect SFT encompass repurchase transactions, securities or commodities lending and borrowing as well as margin lending transactions (including prime brokerage). By applying this approach, we build our EAD calculations on a Monte Carlo simulation of the transactions' future market values. Within this simulation process, interest and foreign exchange rates, credit spreads, equity and commodity prices are modeled by stochastic processes and each derivative and securities financing transaction is revalued at each point of a pre-defined time grid. As a result of this process, a distribution of future market values for each transaction at each time grid point is generated. From these distributions, by considering the appropriate netting and collateral agreements, we derive the exposure measures potential future exposure (PFE), average expected exposure (AEE), expected positive exposure (EPE) and effective expected positive exposure (EEPE).

The potential future exposure measure which we use is generally given by a time profile of simulated positive market values of each counterparty's derivatives portfolio, for which netting and collateralization are considered. For limit monitoring we employ the 95th quantile of the resulting distribution of market values, internally referred to as potential future exposure. The average exposure profiles generated by the same calculation process are used to derive the so-called average expected exposure measure, which we use to reflect expected future replacement costs within our credit risk economic capital, and the expected positive exposure measure driving our regulatory capital requirements. While AEE and EPE are generally calculated with respect to a time horizon of one year, the PFE is measured over the entire lifetime of a transaction or netting set for uncollateralized portfolios and over an appropriate unwind period for collateralized portfolios, respectively. We also employ the aforementioned calculation process to derive stressed exposure results for input into our credit portfolio stress testing.

The PFE profile of each counterparty is compared daily to the PFE limit profile set by the respective credit officer. PFE limits are an integral part of the overall counterparty credit exposure management in line with other limit types. Breaches of PFE limits at any one profile time point are highlighted for action within our credit risk management process. The EPE is an input to the Pillar 1 capital requirement (Risk Weighted Assets), whereas AEE feeds as a loan equivalent into the Group's credit portfolio model (Economic Capital, applied under Pillar 2) where it is combined with all other credit exposure to a counterparty.

For our derivative counterparty credit risk resulting from DB PFK AG we also apply the mark-to-market method according to Article 274 CRR, i.e., we calculate the EAD as the sum of the net positive fair value of the derivative transactions and the regulatory add-ons. As the EAD derivative position resulting from DB PFK AG is 2 % in relation to our overall counterparty credit risk position from derivatives we consider DB PFK AG's derivative position to be immaterial.

For further details on our counterparty credit risk, please refer to the Annual Report 2018 under sections: "Netting and collateral arrangements for derivatives and securities financing transactions", page 68, "Derivatives - credit valuation adjustment", and "Treatment of default situations under derivatives", on pages 134-135 as well as "Credit exposure from derivatives", on page 120.

Article 439 (b) CRR - Collateral and credit reserves for counterparty credit risk

For details regarding collateral and reserve for counterparty credit risk please refer to our Annual Report 2018 section "Managing and mitigation of credit risk" in the sub-section "Netting and collateral arrangements for derivatives and securities financing transactions", on page 68, "Derivatives - credit valuation adjustment", page 134 as well as "Credit exposure from derivatives", on page 120.

Article 439 (c) CRR - Management of wrong-way risk exposures

For information regarding the management of wrong-way risk exposures please refer to the Annual Report 2018, section "Mitigation of credit risk on counterparty level" on page 67, "Treatment of default situations under derivatives" on page 135 and "Country risk management" on page 70.

Article 439 (d) CRR - Collateral in the event of a rating downgrade

For details please refer to the Annual Report 2018, section "Managing and mitigation of credit risk" in the sub-section "Netting and collateral arrangements for derivatives and securities financing transactions" on page 68. Additionally please refer to our Annual Report 2018 to the section "Liquidity risk exposure", sub-section "Stress testing and scenario analysis" on page 147.

Article 439 (f) CRR - CCR exposures by model approach

The following table shows the methods used for calculating the regulatory requirements for CCR exposure including the main parameters for each method. Exposures relevant for credit valuation adjustment (CVA) charges and exposures cleared through a central counterparty (CCP) are presented separately in table CCR2 and CCR8, respectively. Deutsche Bank does not make use of the original exposure method or the standardized approach for derivatives nor the financial collateral simple method for SFTs. Under the mark-to-market method the positive market values before netting and collateral, the potential future exposure and the exposure at default for derivatives are shown, taking credit risk mitigation techniques into account. Under the internal model method (IMM) only the effective expected positive exposure (EEPE) and the exposure at default are presented. Given the nature of the internal model the simulation process of futures market values across all asset classes also includes the impact from regulatory netting and collateralization. For details regarding the calculation method under IMM including the estimation of the alpha factor please refer to introductory section on Counterparty Credit Risk in our annual Pillar 3 Report 2018 on page 122.

EU CCR1 – Analysis of CCR exposure by approach

| | | Dec 31, 2018 | | | | | | |
|-----------|--|--------------|--|----------------------------------|---------|------------|--------------|--------|
| | | a | b | c | d | e | f | g |
| in € | | Notional | Replacement cost/ Current market value | Potential future credit exposure | EEPE | Multiplier | EAD post CRM | RWA |
| 1 | Mark-to-market | – | 6,469 | 5,514 | – | – | 11,977 | 3,831 |
| 2 | Original exposure | 0 | – | – | – | – | 0 | 0 |
| 3 | Standardized approach | – | 0 | – | – | 0 | 0 | 0 |
| 4 | IMM (for derivatives and SFTs) | – | – | – | 103,115 | 1.2 | 123,738 | 17,884 |
| of which: | | – | – | – | | | | |
| 5 | Securities Financing Transactions | – | – | – | 73,247 | 1.2 | 87,896 | 4,441 |
| 6 | Derivatives & Long Settlement Transactions | – | – | – | 29,868 | 1.2 | 35,841 | 13,443 |
| 7 | from Contractual Cross Product Netting | – | – | – | 0 | 0 | 0 | 0 |
| 8 | Financial collateral simple method (for SFTs) | – | – | – | – | – | 0 | 0 |
| 9 | Financial collateral comprehensive method (for SFTs) | – | – | – | – | – | 17,256 | 2,682 |
| 10 | VaR for SFTs | – | – | – | – | – | 0 | 0 |
| 11 | Total | – | – | – | – | – | – | 24,397 |

| | | Jun 30, 2018 | | | | | | |
|-----------|--|--------------|--|----------------------------------|---------|------------|--------------|--------|
| | | a | b | c | d | e | f | g |
| in € | | Notional | Replacement cost/ Current market value | Potential future credit exposure | EEPE | Multiplier | EAD post CRM | RWA |
| 1 | Mark-to-market | – | 2,651 | 14,921 | – | – | 17,568 | 4,464 |
| 2 | Original exposure | 0 | – | – | – | – | 0 | 0 |
| 3 | Standardized approach | – | 0 | – | – | 0 | 0 | 0 |
| 4 | IMM (for derivatives and SFTs) | – | – | – | 107,045 | 1.2 | 128,453 | 21,285 |
| of which: | | – | – | – | | | | |
| 5 | Securities Financing Transactions | – | – | – | 72,424 | 1.2 | 86,909 | 5,456 |
| 6 | Derivatives & Long Settlement Transactions | – | – | – | 34,621 | 1.2 | 41,545 | 15,828 |
| 7 | from Contractual Cross Product Netting | – | – | – | 0 | 0 | 0 | 0 |
| 8 | Financial collateral simple method (for SFTs) | – | – | – | – | – | 0 | 0 |
| 9 | Financial collateral comprehensive method (for SFTs) | – | – | – | – | – | 19,656 | 2,253 |
| 10 | VaR for SFTs | – | – | – | – | – | 0 | 0 |
| 11 | Total | – | – | – | – | – | – | 28,002 |

The decrease in the RWA for counterparty credit risk exposures by € 3.6 billion to € 24.4 billion as of December 31, 2018, compared to € 28.0 billion as of June 30, 2018 is mainly driven by reductions resulting from deleveraging activities in non-strategic businesses and termination of trades in our Corporate & Investment Bank.

The table below provides a breakdown of the credit valuation adjustment (CVA) RWA into advanced and standardized approaches. Furthermore the incremental contributions from the VaR and stressed VaR components are highlighted. We calculate the majority of the CVA based on our own internal model as approved by the competent supervisory authority, which is consistent with the advanced method, driving the reported CVA RWA of € 8.0 billion (96 %), whilst the standardized method covers only € 299 million (4 %) of the total CVA RWA. The stressed VaR component is the main driver of advanced CVA RWA, which results from the stressed period volatilities considered. The reduction in exposure was primarily driven by fewer trades using the mark-to-market method as set out in Article 274 CRR.

EU CCR2 – CVA capital charge

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | |
|---|----------------|-------|-----------------------------|-------|
| | a | b | a | b |
| | Exposure value | RWA | Exposure value ¹ | RWA |
| 1 Total portfolios subject to the Advanced Method | 99,516 | 7,698 | 138,359 | 8,837 |
| 2 (i) VaR component (including the 3× multiplier) | – | 588 | – | 728 |
| 3 (ii) Stressed VaR component (including the 3× multiplier) | – | 7,110 | – | 8,109 |
| 4 All portfolios subject to the Standardized Method | 920 | 299 | 164 | 48 |
| EU4 Based on Original Exposure Method | 0 | 0 | 0 | 0 |
| 5 Total subject to the CVA capital charge | 100,436 | 7,997 | 138,522 | 8,885 |

¹ Comparison period numbers adjusted to reflect the inclusion of the securities financing transactions (SFTs) portfolio based on respective ECB guidance.

The table below presents an overview of our exposures and capital requirements to central counterparties arising from transactions, margins and contributions to default funds. As of December 31, 2018 and June 30, 2018, we only report exposures to qualifying central counterparties (QCCP) as defined in Article 4 (88) CRR.

EU CCR8 – Exposures to CCPs

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | |
|--|--------------|-----|--------------|-----|
| | a | b | a | b |
| | EAD post CRM | RWA | EAD post CRM | RWA |
| 1 Exposures to QCCPs (total) | – | 633 | – | 800 |
| 2 Exposures for trades at QCCPs (excluding initial margin and default fund contributions) | 6,573 | 131 | 8,062 | 161 |
| of which: | | | | |
| 3 (i) OTC derivatives | 1,485 | 30 | 1,884 | 38 |
| 4 (ii) Exchange-traded derivatives | 2,364 | 47 | 3,510 | 70 |
| 5 (iii) Securities financing transactions | 2,725 | 54 | 2,669 | 53 |
| 6 (iv) Netting sets where cross-product netting has been approved | 0 | 0 | 0 | 0 |
| 7 Segregated initial margin | 5,265 | – | 5,266 | – |
| 8 Non-segregated initial margin | 6,103 | 122 | 6,161 | 123 |
| 9 Pre-funded default fund contributions | 931 | 380 | 1,073 | 516 |
| 10 Alternative calculation of own funds requirements for exposures | – | 0 | – | 0 |
| 11 Exposures to non-QCCPs (total) | – | 0 | – | 0 |
| 12 Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions) | 0 | 0 | 0 | 0 |
| of which: | | | | |
| 13 (i) OTC derivatives | 0 | 0 | 0 | 0 |
| 14 (ii) Exchange-traded derivatives | 0 | 0 | 0 | 0 |
| 15 (iii) Securities financing transactions | 0 | 0 | 0 | 0 |
| 16 (iv) Netting sets where cross-product netting has been approved | 0 | 0 | 0 | 0 |
| 17 Segregated initial margin | 0 | – | 0 | – |
| 18 Non-segregated initial margin | 0 | 0 | 0 | 0 |
| 19 Prefunded default fund contributions | 0 | 0 | 0 | 0 |
| 20 Unfunded default fund contributions | 0 | 0 | 0 | 0 |

Article 444 (e) CRR - CCR exposures in the standardized approach

The following table provides the counterparty credit risk exposures in the standardized approach broken down by risk weights and regulatory exposure classes. “Unrated” includes all exposures for which a credit assessment by a nominated ECAI is not available and they therefore receive the standard risk weight according to their exposure classes as described in the CRR.

EU CCR3 – Standardized approach – CCR exposures by regulatory portfolio and risk

| | | Dec 31, 2018 | | | | | | |
|------------------|---|--------------|--------|----|-----|-----|-----|-----|
| in € m. | | Risk Weight | | | | | | |
| Exposure classes | | 0% | 2% | 4% | 10% | 20% | 50% | 70% |
| 1 | Central governments or central banks | 2,977 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Regional governments or local authorities | 174 | 0 | 0 | 0 | 616 | 0 | 0 |
| 3 | Public sector entities | 456 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4 | Multilateral development banks | 1,068 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Institutions | 0 | 12,473 | 0 | 0 | 34 | 6 | 0 |
| 7 | Corporates | 0 | 0 | 0 | 0 | 35 | 0 | 0 |
| 8 | Retail | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8a | Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8b | Exposures in default | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8c | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8d | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9a | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9b | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Other items | 0 | 302 | 0 | 0 | 0 | 0 | 0 |
| 11 | Total | 4,676 | 12,775 | 0 | 0 | 687 | 6 | 0 |

| | | Dec 31, 2018 | | | | | |
|------------------|---|--------------|-------|------|--------|--------|-----------|
| in € m. | | Risk Weight | | | | | Of which: |
| Exposure classes | | 75% | 100% | 150% | Others | Total | unrated |
| 1 | Central governments or central banks | 0 | 0 | 0 | 0 | 2,977 | 2,977 |
| 2 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 791 | 833 |
| 3 | Public sector entities | 0 | 0 | 0 | 0 | 458 | 458 |
| 4 | Multilateral development banks | 0 | 0 | 0 | 0 | 1,068 | 1,068 |
| 5 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Institutions | 0 | 66 | 0 | 0 | 12,579 | 12,551 |
| 7 | Corporates | 0 | 1,037 | 0 | 0 | 1,072 | 943 |
| 8 | Retail | 6 | 0 | 0 | 0 | 6 | 6 |
| 8a | Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 0 | 0 |
| 8b | Exposures in default | 0 | 0 | 0 | 0 | 0 | 0 |
| 8c | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 0 | 0 |
| 8d | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 |
| 9a | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 |
| 9b | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Other items | 0 | 0 | 0 | 0 | 302 | 302 |
| 11 | Total | 6 | 1,103 | 0 | 0 | 19,252 | 19,138 |

| | | Jun 30, 2018 | | | | | | |
|------------------|---|--------------|--------|----|-----|-----|-----|-----|
| in € m. | | Risk Weight | | | | | | |
| Exposure classes | | 0% | 2% | 4% | 10% | 20% | 50% | 70% |
| 1 | Central governments or central banks | 2,974 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Regional governments or local authorities | 182 | 0 | 0 | 0 | 124 | 0 | 0 |
| 3 | Public sector entities | 303 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Multilateral development banks | 726 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Institutions | 0 | 14,142 | 0 | 0 | 209 | 0 | 0 |
| 7 | Corporates | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 8 | Retail | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8a | Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8b | Exposures in default | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8c | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8d | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9a | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9b | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Other items | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | Total | 4,185 | 14,142 | 0 | 0 | 335 | 0 | 0 |

| | | Risk Weight | | | | | Jun 30, 2018 | |
|------------------|---|-------------|-------|------|--------|--------|----------------------|--|
| in € m. | | | | | | | | |
| Exposure classes | | 75% | 100% | 150% | Others | Total | Of which: unrated | |
| 1 | Central governments or central banks | 0 | 0 | 0 | 0 | 2,974 | 2,974 | |
| 2 | Regional governments or local authorities | 0 | 0 | 0 | 0 | 306 | 306 | |
| 3 | Public sector entities | 0 | 0 | 0 | 0 | 303 | 301 | |
| 4 | Multilateral development banks | 0 | 0 | 0 | 0 | 726 | 726 | |
| 5 | International organizations | 0 | 0 | 0 | 0 | 0 | 0 | |
| 6 | Institutions | 0 | 0 | 0 | 0 | 14,351 | 14,280 | |
| 7 | Corporates | 0 | 3,002 | 0 | 0 | 3,005 | 1,079 | |
| 8 | Retail | 4 | 0 | 0 | 0 | 4 | 4 | |
| 8a | Secured by mortgages on immovable property | 0 | 0 | 0 | 0 | 0 | 0 | |
| 8b | Exposures in default | 0 | 0 | 1 | 0 | 1 | 1 | |
| 8c | Items associated with particularly high risk | 0 | 0 | 0 | 0 | 0 | 0 | |
| 8d | Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | |
| 9 | Claims on institutions and corporates with a short-term credit assessment | 0 | 0 | 0 | 0 | 0 | 0 | |
| 9a | Collective investments undertakings (CIU) | 0 | 0 | 0 | 0 | 0 | 0 | |
| 9b | Equity exposures | 0 | 0 | 0 | 0 | 0 | 0 | |
| 10 | Other items | 0 | 0 | 0 | 0 | 0 | 424 | |
| 11 | Total | 4 | 3,002 | 1 | 0 | 21,670 | 20,094 | |

The counterparty credit risk exposures (EADs) were at € 19.3 billion as of December 31, 2018, compared to € 21.7 billion as of June 30, 2018. The overall decrease of € 2.4 billion is related to termination of trades along with matured positions and reduced exposures in processed trades.

Article 452 (e) CRR - CCR exposures within the advanced IRBA

In the following tables we show our advanced IRBA counterparty credit risk exposures, i.e. derivatives and securities financing transactions, distributed on our internal rating scale for exposure classes central governments and central banks, institutions as well as corporates and retail with their relevant subcategories. CVA charges or exposures cleared through a CCP are excluded.

We show the EAD after CRM and CCF ("EAD net"), where exposures covered by guarantees or credit derivatives are assigned to the protection seller. As a consequence the EAD net can be higher than the original balance sheet exposure.

The EAD net is presented in conjunction with exposure-weighted average PD, LGD, and maturity as well as the RWA, the average risk weight (RW) and the number of obligors. The effect of double default, as far as applicable to exposures outside of Postbank, is considered in the average RW. It implies that for a guaranteed exposure a loss only occurs if the primary obligor and the guarantor fail to meet their obligations at the same time. The tables provide the defaulted exposure separately, where we apply a LGD model already incorporating potential unexpected losses in the loss rate estimate as required by Article 181 (1)(h) CRR.

EU CCR4 – AIRB approach – CCR exposures by portfolio and PD scale

Dec 31, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g |
|--|----------------|----------------------|-------------------------------------|-----------------------|--------------------------------|---------------|----------------------|
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Central governments and central banks | | | | | | | |
| 0.00 to <0.15 | 5,941 | 0.02 | 0.1 | 41.16 | 1.1 | 385 | 6.48 |
| 0.15 to <0.25 | 66 | 0.23 | <0.1 | 49.85 | 0.1 | 19 | 28.30 |
| 0.25 to <0.50 | 92 | 0.39 | <0.1 | 47.33 | 3.0 | 71 | 76.54 |
| 0.50 to <0.75 | 8 | 0.64 | <0.1 | 30.00 | 5.0 | 6 | 76.04 |
| 0.75 to <2.50 | 32 | 1.75 | <0.1 | 30.00 | 4.9 | 32 | 100.21 |
| 2.50 to <10.00 | 1,387 | 4.11 | <0.1 | 20.77 | 2.8 | 1,149 | 82.85 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 21 | 100.00 | <0.1 | 0.60 | 4.8 | 3 | 12.50 |
| Sub-total | 7,547 | 1.06 | 0.1 | 37.40 | 1.5 | 1,664 | 22.05 |
| Institutions | | | | | | | |
| 0.00 to <0.15 | 22,717 | 0.05 | 0.5 | 42.21 | 1.2 | 3,778 | 16.63 |
| 0.15 to <0.25 | 212 | 0.23 | <0.1 | 46.86 | 3.2 | 150 | 70.86 |
| 0.25 to <0.50 | 403 | 0.39 | 0.1 | 53.23 | 1.8 | 315 | 78.19 |
| 0.50 to <0.75 | 402 | 0.64 | <0.1 | 44.12 | 2.1 | 349 | 86.77 |
| 0.75 to <2.50 | 193 | 1.53 | 0.1 | 59.53 | 1.3 | 279 | 144.40 |
| 2.50 to <10.00 | 125 | 3.66 | <0.1 | 22.36 | 1.3 | 80 | 64.07 |
| 10.00 to <100.00 | 21 | 20.75 | <0.1 | 57.62 | 4.5 | 81 | 377.99 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 7.00 | 5.0 | 0 | 87.50 |
| Sub-total | 24,074 | 0.12 | 0.7 | 42.52 | 1.2 | 5,033 | 20.91 |
| Corporates | | | | | | | |
| 0.00 to <0.15 | 99,617 | 0.04 | 10.7 | 33.68 | 0.6 | 6,847 | 6.87 |
| 0.15 to <0.25 | 2,505 | 0.23 | 0.7 | 25.27 | 3.0 | 860 | 34.34 |
| 0.25 to <0.50 | 3,472 | 0.39 | 0.8 | 32.73 | 1.7 | 1,675 | 48.23 |
| 0.50 to <0.75 | 3,842 | 0.64 | 0.9 | 27.50 | 1.7 | 1,818 | 47.32 |
| 0.75 to <2.50 | 3,151 | 1.33 | 1.1 | 40.32 | 2.6 | 2,977 | 94.49 |
| 2.50 to <10.00 | 1,463 | 4.80 | 0.5 | 34.08 | 3.1 | 1,638 | 111.96 |
| 10.00 to <100.00 | 655 | 17.93 | 0.1 | 15.48 | 1.7 | 516 | 78.81 |
| 100.00 (Default) | 18 | 100.00 | <0.1 | 12.99 | 1.5 | 14 | 76.58 |
| Sub-total | 114,722 | 0.29 | 14.7 | 33.34 | 0.8 | 16,345 | 14.25 |
| of which: | | | | | | | |
| SMEs | | | | | | | |
| 0.00 to <0.15 | 494 | 0.07 | 0.2 | 49.44 | 2.2 | 134 | 27.21 |
| 0.15 to <0.25 | 70 | 0.23 | 0.1 | 47.33 | 2.4 | 35 | 49.45 |
| 0.25 to <0.50 | 47 | 0.39 | 0.1 | 40.61 | 3.2 | 30 | 63.08 |
| 0.50 to <0.75 | 67 | 0.64 | 0.1 | 50.51 | 0.6 | 36 | 53.60 |
| 0.75 to <2.50 | 18 | 1.31 | 0.1 | 50.61 | 3.1 | 20 | 110.41 |
| 2.50 to <10.00 | 23 | 5.01 | 0.1 | 50.59 | 2.8 | 33 | 140.71 |
| 10.00 to <100.00 | 2 | 29.35 | <0.1 | 43.09 | 3.6 | 4 | 217.03 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 99.89 | 1.7 | 0 | 0.16 |
| Sub-total | 721 | 0.47 | 0.5 | 48.83 | 2.2 | 291 | 40.33 |
| Specialized Lending | | | | | | | |
| 0.00 to <0.15 | 83 | 0.07 | <0.1 | 53.51 | 3.7 | 33 | 39.07 |
| 0.15 to <0.25 | 21 | 0.23 | <0.1 | 43.10 | 4.0 | 13 | 60.93 |
| 0.25 to <0.50 | 46 | 0.39 | <0.1 | 48.85 | 3.7 | 37 | 81.37 |
| 0.50 to <0.75 | 25 | 0.64 | <0.1 | 51.53 | 3.6 | 27 | 107.82 |
| 0.75 to <2.50 | 61 | 1.27 | <0.1 | 47.40 | 3.5 | 78 | 127.63 |
| 2.50 to <10.00 | 309 | 4.75 | <0.1 | 18.57 | 4.8 | 229 | 74.26 |
| 10.00 to <100.00 | 127 | 30.50 | <0.1 | 10.28 | 3.7 | 78 | 61.03 |
| 100.00 (Default) | 1 | 100.00 | <0.1 | 18.90 | 1.9 | 0 | 22.24 |
| Sub-total | 674 | 8.34 | 0.2 | 27.99 | 4.2 | 495 | 73.49 |

Dec 31, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g |
|---|----------------|----------------------|-------------------------------------|-----------------------|--------------------------------|---------------|----------------------|
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Other | | | | | | | |
| 0.00 to <0.15 | 99,040 | 0.04 | 10.5 | 33.59 | 0.6 | 6,680 | 6.74 |
| 0.15 to <0.25 | 2,414 | 0.23 | 0.6 | 24.48 | 3.0 | 813 | 33.68 |
| 0.25 to <0.50 | 3,379 | 0.39 | 0.7 | 32.40 | 1.7 | 1,608 | 47.57 |
| 0.50 to <0.75 | 3,750 | 0.64 | 0.8 | 26.93 | 1.7 | 1,755 | 46.80 |
| 0.75 to <2.50 | 3,072 | 1.33 | 1.0 | 40.12 | 2.6 | 2,879 | 93.74 |
| 2.50 to <10.00 | 1,131 | 4.81 | 0.4 | 37.97 | 2.6 | 1,376 | 121.66 |
| 10.00 to <100.00 | 526 | 14.85 | <0.1 | 16.65 | 1.3 | 435 | 82.63 |
| 100.00 (Default) | 16 | 100.00 | <0.1 | 10.51 | 1.5 | 13 | 83.32 |
| Sub-total | 113,328 | 0.24 | 14.0 | 33.28 | 0.8 | 15,559 | 13.73 |
| Retail | | | | | | | |
| 0.00 to <0.15 | 12 | 0.05 | 0.2 | 58.27 | 1.2 | 1 | 9.11 |
| 0.15 to <0.25 | 2 | 0.23 | <0.1 | 56.71 | 1.8 | 0 | 22.82 |
| 0.25 to <0.50 | 5 | 0.39 | 0.1 | 56.99 | 1.4 | 2 | 33.54 |
| 0.50 to <0.75 | 6 | 0.64 | 0.1 | 57.43 | 1.3 | 3 | 47.20 |
| 0.75 to <2.50 | 8 | 1.35 | 0.1 | 57.05 | 1.5 | 5 | 62.28 |
| 2.50 to <10.00 | 8 | 4.32 | 0.1 | 56.19 | 1.2 | 6 | 78.64 |
| 10.00 to <100.00 | 1 | 25.62 | <0.1 | 56.64 | 1.1 | 1 | 93.33 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 16.50 | 1.0 | 0 | 206.25 |
| Sub-total | 41 | 1.82 | 0.6 | 57.25 | 1.3 | 18 | 43.88 |
| of which: | | | | | | | |
| Secured by real estate property SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Secured by real estate property non-SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Qualifying Revolving | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| in € m. (unless stated otherwise) | a | b | c | d | e | f | g |
|--------------------------------------|----------------|----------------------|-------------------------------------|-----------------------|--------------------------------|---------------|----------------------|
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Other retail SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0.11 | <0.1 | 56.18 | 1.3 | 0 | 12.37 |
| 0.15 to <0.25 | 1 | 0.23 | <0.1 | 56.56 | 1.7 | 0 | 21.94 |
| 0.25 to <0.50 | 3 | 0.39 | <0.1 | 57.02 | 1.2 | 1 | 29.26 |
| 0.50 to <0.75 | 2 | 0.64 | <0.1 | 57.17 | 1.4 | 1 | 38.42 |
| 0.75 to <2.50 | 3 | 1.29 | 0.1 | 56.73 | 1.4 | 2 | 51.21 |
| 2.50 to <10.00 | 4 | 4.17 | 0.1 | 55.15 | 1.2 | 2 | 67.31 |
| 10.00 to <100.00 | 0 | 19.20 | <0.1 | 55.31 | 1.4 | 0 | 89.62 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 16.50 | 1.0 | 0 | 206.25 |
| Sub-total | 14 | 1.93 | 0.2 | 56.37 | 1.3 | 6 | 46.06 |
| Other retail non-SMEs | | | | | | | |
| 0.00 to <0.15 | 11 | 0.05 | 0.2 | 58.32 | 1.2 | 1 | 9.03 |
| 0.15 to <0.25 | 0 | 0.23 | <0.1 | 57.57 | 1.8 | 0 | 27.97 |
| 0.25 to <0.50 | 3 | 0.39 | <0.1 | 56.96 | 1.6 | 1 | 37.92 |
| 0.50 to <0.75 | 4 | 0.64 | <0.1 | 57.57 | 1.3 | 2 | 51.69 |
| 0.75 to <2.50 | 5 | 1.39 | <0.1 | 57.28 | 1.6 | 3 | 70.18 |
| 2.50 to <10.00 | 4 | 4.45 | <0.1 | 57.05 | 1.2 | 4 | 87.98 |
| 10.00 to <100.00 | 1 | 27.36 | <0.1 | 57.00 | 1.0 | 1 | 94.33 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 28 | 1.76 | 0.3 | 57.67 | 1.3 | 12 | 42.83 |
| Total (all exposure classes) | 146,385 | 0.30 | 16.1 | 35.07 | 0.9 | 23,060 | 15.75 |

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| in € m. (unless stated otherwise) | a | b | c | d | e | f | g |
|--|----------------|----------------------|-------------------------------------|-----------------------|--------------------------------|---------------|----------------------|
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Central governments and central banks | | | | | | | |
| 0.00 to <0.15 | 7,065 | 0.03 | 0.1 | 40.93 | 1.1 | 492 | 6.96 |
| 0.15 to <0.25 | 26 | 0.23 | <0.1 | 25.42 | 4.7 | 10 | 39.50 |
| 0.25 to <0.50 | 369 | 0.39 | <0.1 | 49.45 | 1.0 | 191 | 51.80 |
| 0.50 to <0.75 | 8 | 0.64 | <0.1 | 30.00 | 5.0 | 6 | 76.21 |
| 0.75 to <2.50 | 30 | 1.76 | <0.1 | 30.00 | 4.9 | 30 | 100.21 |
| 2.50 to <10.00 | 863 | 3.60 | <0.1 | 15.97 | 0.6 | 403 | 46.62 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 24 | 100.00 | <0.1 | 0.90 | 5.0 | 3 | 12.50 |
| Sub-total | 8,386 | 0.70 | 0.1 | 38.52 | 1.0 | 1,135 | 13.53 |
| Institutions | | | | | | | |
| 0.00 to <0.15 | 35,628 | 0.05 | 0.5 | 40.52 | 1.3 | 5,035 | 14.13 |
| 0.15 to <0.25 | 362 | 0.23 | <0.1 | 49.51 | 2.9 | 268 | 74.12 |
| 0.25 to <0.50 | 362 | 0.39 | 0.1 | 56.51 | 1.6 | 266 | 73.48 |
| 0.50 to <0.75 | 442 | 0.64 | <0.1 | 49.94 | 1.2 | 408 | 92.24 |
| 0.75 to <2.50 | 268 | 1.31 | 0.1 | 55.34 | 1.6 | 382 | 142.17 |
| 2.50 to <10.00 | 27 | 6.07 | <0.1 | 47.26 | 2.4 | 41 | 154.40 |
| 10.00 to <100.00 | 17 | 20.98 | <0.1 | 57.92 | 4.5 | 66 | 376.00 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 5.00 | 1.0 | 0 | 62.50 |
| Sub-total | 37,107 | 0.09 | 0.7 | 41.00 | 1.4 | 6,466 | 17.42 |
| Corporates | | | | | | | |
| 0.00 to <0.15 | 95,985 | 0.04 | 10.8 | 33.88 | 0.7 | 7,233 | 7.54 |
| 0.15 to <0.25 | 3,194 | 0.23 | 0.7 | 29.73 | 2.6 | 1,127 | 35.29 |
| 0.25 to <0.50 | 4,504 | 0.39 | 0.9 | 26.79 | 1.3 | 1,796 | 39.88 |
| 0.50 to <0.75 | 3,592 | 0.64 | 1.0 | 34.27 | 1.5 | 2,352 | 65.50 |
| 0.75 to <2.50 | 4,141 | 1.24 | 1.3 | 38.94 | 2.4 | 3,717 | 89.75 |
| 2.50 to <10.00 | 2,202 | 4.78 | 0.6 | 28.41 | 2.6 | 2,161 | 98.18 |
| 10.00 to <100.00 | 410 | 15.55 | 0.1 | 22.03 | 1.0 | 487 | 118.86 |
| 100.00 (Default) | 41 | 69.82 | <0.1 | 9.09 | 1.6 | 22 | 53.61 |
| Sub-total | 114,068 | 0.29 | 15.4 | 33.52 | 0.9 | 18,896 | 16.57 |
| of which: | | | | | | | |
| SMEs | | | | | | | |
| 0.00 to <0.15 | 499 | 0.07 | 0.2 | 52.23 | 2.2 | 141 | 28.17 |
| 0.15 to <0.25 | 69 | 0.23 | 0.1 | 46.82 | 3.2 | 37 | 52.85 |
| 0.25 to <0.50 | 50 | 0.39 | 0.1 | 43.32 | 2.4 | 26 | 52.75 |
| 0.50 to <0.75 | 64 | 0.64 | 0.1 | 50.55 | 0.8 | 35 | 54.86 |
| 0.75 to <2.50 | 25 | 1.50 | 0.1 | 49.69 | 2.3 | 24 | 93.89 |
| 2.50 to <10.00 | 38 | 5.90 | 0.1 | 44.18 | 2.7 | 44 | 115.48 |
| 10.00 to <100.00 | 3 | 18.20 | <0.1 | 49.97 | 2.3 | 6 | 208.99 |
| 100.00 (Default) | 1 | 100.00 | <0.1 | 71.02 | 2.3 | 0 | 11.33 |
| Sub-total | 750 | 0.64 | 0.7 | 50.50 | 2.2 | 313 | 41.72 |
| Specialized Lending | | | | | | | |
| 0.00 to <0.15 | 150 | 0.07 | <0.1 | 52.78 | 4.0 | 61 | 40.78 |
| 0.15 to <0.25 | 16 | 0.23 | <0.1 | 39.57 | 4.9 | 10 | 66.11 |
| 0.25 to <0.50 | 47 | 0.39 | <0.1 | 43.91 | 4.4 | 40 | 84.80 |
| 0.50 to <0.75 | 30 | 0.64 | <0.1 | 50.16 | 4.0 | 34 | 112.13 |
| 0.75 to <2.50 | 60 | 1.29 | <0.1 | 48.76 | 4.0 | 83 | 138.51 |
| 2.50 to <10.00 | 425 | 4.69 | 0.1 | 16.83 | 4.0 | 269 | 63.29 |
| 10.00 to <100.00 | 20 | 18.78 | <0.1 | 48.83 | 3.9 | 56 | 279.31 |
| 100.00 (Default) | 1 | 100.00 | <0.1 | 2.00 | 2.1 | 0 | 25.00 |
| Sub-total | 750 | 3.48 | 0.2 | 30.95 | 4.0 | 554 | 73.91 |

Jun 30, 2018

| in € m. (unless stated otherwise) | a | b | c | d | e | f | g |
|---|----------------|----------------------|-------------------------------------|-----------------------|--------------------------------|---------------|----------------------|
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Other | | | | | | | |
| 0.00 to <0.15 | 95,336 | 0.04 | 10.6 | 33.75 | 0.6 | 7,031 | 7.37 |
| 0.15 to <0.25 | 3,109 | 0.23 | 0.6 | 29.30 | 2.5 | 1,080 | 34.74 |
| 0.25 to <0.50 | 4,407 | 0.39 | 0.8 | 26.42 | 1.2 | 1,730 | 39.25 |
| 0.50 to <0.75 | 3,497 | 0.64 | 0.9 | 33.84 | 1.5 | 2,283 | 65.29 |
| 0.75 to <2.50 | 4,056 | 1.24 | 1.2 | 38.73 | 2.4 | 3,610 | 89.00 |
| 2.50 to <10.00 | 1,738 | 4.77 | 0.4 | 30.89 | 2.3 | 1,848 | 106.34 |
| 10.00 to <100.00 | 387 | 15.37 | <0.1 | 20.45 | 0.8 | 425 | 109.93 |
| 100.00 (Default) | 39 | 68.52 | <0.1 | 8.36 | 1.6 | 22 | 55.05 |
| Sub-total | 112,569 | 0.27 | 14.5 | 33.42 | 0.8 | 18,029 | 16.02 |
| Retail | | | | | | | |
| 0.00 to <0.15 | 14 | 0.06 | 0.3 | 55.78 | 1.8 | 1 | 9.53 |
| 0.15 to <0.25 | 3 | 0.23 | <0.1 | 55.83 | 1.2 | 1 | 21.85 |
| 0.25 to <0.50 | 7 | 0.39 | 0.1 | 56.21 | 1.8 | 3 | 33.70 |
| 0.50 to <0.75 | 10 | 0.64 | 0.1 | 55.96 | 1.2 | 4 | 43.42 |
| 0.75 to <2.50 | 13 | 1.27 | 0.2 | 54.84 | 1.3 | 7 | 56.97 |
| 2.50 to <10.00 | 15 | 4.56 | 0.2 | 55.60 | 1.3 | 12 | 77.11 |
| 10.00 to <100.00 | 2 | 34.77 | <0.1 | 55.89 | 1.3 | 2 | 81.25 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 40.55 | 2.3 | 0 | 141.03 |
| Sub-total | 65 | 2.81 | 0.9 | 55.61 | 1.5 | 30 | 46.01 |
| of which: | | | | | | | |
| Secured by real estate property SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Secured by real estate property non-SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Qualifying Revolving | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| in € m. (unless stated otherwise) | a | b | c | d | e | f | g |
|--------------------------------------|----------------|----------------------|-------------------------------------|-----------------------|--------------------------------|---------------|----------------------|
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Other retail SMEs | | | | | | | |
| 0.00 to <0.15 | 1 | 0.12 | <0.1 | 48.66 | 1.1 | 0 | 11.50 |
| 0.15 to <0.25 | 3 | 0.23 | <0.1 | 56.82 | 1.2 | 1 | 21.24 |
| 0.25 to <0.50 | 3 | 0.39 | <0.1 | 56.30 | 1.3 | 1 | 28.29 |
| 0.50 to <0.75 | 5 | 0.64 | 0.1 | 54.66 | 1.3 | 2 | 36.55 |
| 0.75 to <2.50 | 6 | 1.27 | 0.1 | 54.56 | 1.2 | 3 | 48.52 |
| 2.50 to <10.00 | 7 | 4.62 | 0.1 | 55.04 | 1.4 | 4 | 64.88 |
| 10.00 to <100.00 | 1 | 38.02 | <0.1 | 55.10 | 1.3 | 1 | 74.22 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 40.55 | 2.3 | 0 | 141.03 |
| Sub-total | 26 | 3.63 | 0.4 | 54.91 | 1.3 | 12 | 44.82 |
| Other retail non-SMEs | | | | | | | |
| 0.00 to <0.15 | 13 | 0.05 | 0.2 | 56.35 | 1.8 | 1 | 9.37 |
| 0.15 to <0.25 | 1 | 0.23 | <0.1 | 51.47 | 1.4 | 0 | 24.51 |
| 0.25 to <0.50 | 4 | 0.39 | <0.1 | 56.14 | 2.2 | 2 | 37.84 |
| 0.50 to <0.75 | 4 | 0.64 | <0.1 | 57.47 | 1.1 | 2 | 51.44 |
| 0.75 to <2.50 | 7 | 1.28 | 0.1 | 55.10 | 1.4 | 4 | 64.96 |
| 2.50 to <10.00 | 9 | 4.51 | 0.1 | 56.02 | 1.3 | 7 | 86.45 |
| 10.00 to <100.00 | 1 | 31.12 | <0.1 | 56.77 | 1.2 | 1 | 89.15 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 38 | 2.24 | 0.5 | 56.10 | 1.6 | 18 | 46.83 |
| Total (all exposure classes) | 159,626 | 0.27 | 17.1 | 35.53 | 1.0 | 26,526 | 16.62 |

The RWA for our counterparty credit risk portfolio treated in the advanced IRBA were at € 23.1 billion as of December 31, 2018, compared to € 26.5 billion as of June 2018. The overall decrease by € 3.5 billion is mostly related to the deleveraging activities and termination of trades in our Corporate & Investment Bank.

Article 452 (e) CRR - CCR exposures within the foundation IRBA

In the following tables we show our foundation IRBA counterparty credit risk exposures, i.e. derivatives and securities financing transactions, distributed on our internal rating scale for exposure classes central governments and central banks, institutions as well as corporates with their relevant subcategories. CVA charges or exposures cleared through a CCP are excluded.

We show the EAD after CRM ("EAD net"), where exposures covered by guarantees or credit derivatives are assigned to the protection seller. As a consequence the EAD net can be higher than the original balance sheet exposure.

The EAD net is presented in conjunction with exposures-weighted average PD, RWAs, the average risk weight (RW) and the number of obligors. In addition it provides the average LGD and average maturity, which is regulatory pre-defined in the foundation IRB. The tables provide the defaulted exposure separately.

EU CCR4 – FIRB approach – CCR exposures by portfolio and PD scale

| in € m. | | | | | | | Dec 31, 2018 |
|--|------------|----------------------|-------------------------------------|-----------------------|--------------------------------|------------|----------------------|
| (unless stated otherwise) | | | | | | | |
| | a | b | c | d | e | f | g |
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Central governments and central banks | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Institutions | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corporates | | | | | | | |
| 0.00 to <0.15 | 4 | 0.07 | <0.1 | 45.00 | 2.5 | 1 | 27.87 |
| 0.15 to <0.25 | 60 | 0.22 | 0.2 | 45.00 | 2.5 | 29 | 47.98 |
| 0.25 to <0.50 | 29 | 0.38 | 0.1 | 45.00 | 2.5 | 19 | 63.83 |
| 0.50 to <0.75 | 5 | 0.69 | <0.1 | 45.00 | 2.5 | 4 | 82.55 |
| 0.75 to <2.50 | 4 | 1.31 | <0.1 | 45.00 | 2.5 | 4 | 104.85 |
| 2.50 to <10.00 | 0 | 6.47 | <0.1 | 45.00 | 2.5 | 1 | 163.37 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 45.00 | 2.5 | 0 | 0 |
| Sub-total¹ | 177 | 0.57 | 0.4 | 45.00 | 2.5 | 127 | 71.66 |
| of which: | | | | | | | |
| SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 2 | 0.22 | <0.1 | 45.00 | 2.5 | 1 | 37.85 |
| 0.25 to <0.50 | 2 | 0.38 | <0.1 | 45.00 | 2.5 | 1 | 51.13 |
| 0.50 to <0.75 | 1 | 0.69 | <0.1 | 45.00 | 2.5 | 0 | 67.93 |
| 0.75 to <2.50 | 0 | 1.51 | <0.1 | 45.00 | 2.5 | 0 | 91.92 |
| 2.50 to <10.00 | 0 | 3.85 | <0.1 | 45.00 | 2.5 | 0 | 103.85 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 5 | 0.52 | 0.1 | 45.00 | 2.5 | 3 | 53.24 |
| Specialized Lending | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total¹ | 74 | 0 | 0.1 | 0 | 0 | 69 | 93.52 |
| Other | | | | | | | |
| 0.00 to <0.15 | 4 | 0.07 | <0.1 | 45.00 | 2.5 | 1 | 27.87 |
| 0.15 to <0.25 | 58 | 0.22 | 0.1 | 45.00 | 2.5 | 28 | 48.25 |
| 0.25 to <0.50 | 27 | 0.38 | <0.1 | 45.00 | 2.5 | 18 | 64.85 |
| 0.50 to <0.75 | 5 | 0.69 | <0.1 | 45.00 | 2.5 | 4 | 84.83 |
| 0.75 to <2.50 | 3 | 1.29 | <0.1 | 45.00 | 2.5 | 3 | 106.26 |
| 2.50 to <10.00 | 0 | 7.26 | <0.1 | 45.00 | 2.5 | 1 | 181.41 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 45.00 | 2.5 | 0 | 0 |
| Sub-total | 98 | 0.58 | 0.2 | 45.00 | 2.5 | 55 | 55.93 |
| Total | 177 | 0.57 | 0.4 | 45.00 | 2.5 | 127 | 71.66 |

¹ This row includes exposures, which are risk weighted in accordance with Article 153 (5) CRR. Therefore PD-estimations are not available for these transactions.

| in € m. | | | | | | | Jun 30, 2018 |
|--|------------|----------------------|-------------------------------------|-----------------------|--------------------------------|-----------|----------------------|
| (unless stated otherwise) | | | | | | | |
| | a | b | c | d | e | f | g |
| Exposure class/ PD scale | EAD net | Average PD (in %) | Number of obligors (in 1,000) | Average LGD (in %) | Average maturity (in years) | RWA | Average RW (in %) |
| Central governments and central banks | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Institutions | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corporates | | | | | | | |
| 0.00 to <0.15 | 2 | 0.09 | <0.1 | 45.00 | 2.5 | 1 | 29.83 |
| 0.15 to <0.25 | 67 | 0.21 | 0.2 | 45.00 | 2.5 | 32 | 47.37 |
| 0.25 to <0.50 | 32 | 0.38 | 0.1 | 45.00 | 2.5 | 20 | 63.79 |
| 0.50 to <0.75 | 6 | 0.69 | 0.1 | 45.00 | 2.5 | 5 | 81.66 |
| 0.75 to <2.50 | 2 | 1.32 | <0.1 | 45.00 | 2.5 | 2 | 100.62 |
| 2.50 to <10.00 | 1 | 5.14 | <0.1 | 45.00 | 2.5 | 1 | 152.61 |
| 10.00 to <100.00 | 2 | 19.99 | <0.1 | 45.00 | 2.5 | 5 | 252.50 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 45.00 | 2.5 | 0 | 0 |
| Sub-total | 112 | 1.06 | 0.3 | 45.00 | 2.5 | 65 | 58.39 |
| of which: | | | | | | | |
| SMEs | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 4 | 0.22 | <0.1 | 45.00 | 2.5 | 1 | 39.21 |
| 0.25 to <0.50 | 3 | 0.38 | <0.1 | 45.00 | 2.5 | 1 | 51.60 |
| 0.50 to <0.75 | 1 | 0.69 | <0.1 | 45.00 | 2.5 | 1 | 67.90 |
| 0.75 to <2.50 | 1 | 1.24 | <0.1 | 45.00 | 2.5 | 1 | 89.19 |
| 2.50 to <10.00 | 0 | 3.82 | <0.1 | 45.00 | 2.5 | 0 | 103.64 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 8 | 0.48 | 0.1 | 45.00 | 2.5 | 4 | 52.47 |
| Specialized Lending | | | | | | | |
| 0.00 to <0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.15 to <0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.25 to <0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.50 to <0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.75 to <2.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.50 to <10.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.00 to <100.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100.00 (Default) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | | | | | | | |
| 0.00 to <0.15 | 2 | 0.09 | <0.1 | 45.00 | 2.5 | 1 | 29.83 |
| 0.15 to <0.25 | 63 | 0.21 | 0.1 | 45.00 | 2.5 | 30 | 47.85 |
| 0.25 to <0.50 | 29 | 0.38 | <0.1 | 45.00 | 2.5 | 19 | 64.85 |
| 0.50 to <0.75 | 5 | 0.69 | <0.1 | 45.00 | 2.5 | 4 | 84.83 |
| 0.75 to <2.50 | 1 | 1.37 | <0.1 | 45.00 | 2.5 | 1 | 108.01 |
| 2.50 to <10.00 | 1 | 5.39 | <0.1 | 45.00 | 2.5 | 1 | 162.09 |
| 10.00 to <100.00 | 2 | 19.99 | <0.1 | 45.00 | 2.5 | 5 | 252.50 |
| 100.00 (Default) | 0 | 100.00 | <0.1 | 45.00 | 2.5 | 0 | 0 |
| Sub-total | 104 | 1.11 | 0.2 | 45.00 | 2.5 | 61 | 58.86 |
| Total | 112 | 1.06 | 0.3 | 45.00 | 2.5 | 65 | 58.39 |

Article 438 (d) CRR - Development of CCR RWA

The following table provides an analysis of key drivers for RWA movements observed for counterparty credit risk exposures calculated under the internal model method (IMM) in the current and previous reporting period. It also shows the corresponding movements in capital requirements, derived from the RWA by an 8 % capital ratio.

EU CCR7 – RWA flow statement of counterparty credit risk exposures under the internal model method

| | Three months ended Dec 31, 2018 | | Three months ended Sep 30, 2018 | |
|--|---------------------------------|----------------------|---------------------------------|----------------------|
| | a | b | a | b |
| in € m. | RWA | Capital requirements | RWA | Capital requirements |
| 1 Counterparty credit risk RWA under the IMM opening balance | 18,714 | 1,497 | 21,525 | 1,722 |
| 2 Book size | (768) | (61) | (1,852) | (148) |
| 3 Book quality | 81 | 7 | (69) | (6) |
| 4 Model updates | 0 | 0 | (850) | (68) |
| 5 Methodology and policy | 0 | 0 | 0 | 0 |
| 6 Acquisitions and disposals | 0 | 0 | 0 | 0 |
| 7 Foreign exchange movements | 50 | 4 | (40) | (3) |
| 8 Other | 0 | 0 | 0 | 0 |
| 9 Counterparty credit risk RWA under the IMM closing balance | 18,077 | 1,446 | 18,714 | 1,497 |

Organic changes in our portfolio size and composition are considered in the category “Book size”. The category “Book quality” mainly represents the effects from portfolio rating migrations, loss given default, model parameter recalibrations as well as collateral coverage and netting activities. “Model updates” include model refinements and model roll out. RWA movements resulting from externally, regulatory-driven changes, e.g. applying new regulations, are considered in the “Methodology and policy” section. “Acquisition and disposals” shows significant exposure movements which can be clearly assigned to new businesses or disposal-related activities. Changes that cannot be attributed to the above categories are reflected in the category “Other”.

The decrease in RWA for counterparty credit risk exposures under the IMM by 3.4 % or € 0.6 billion since September 30, 2018 is predominantly driven by the category “Book size” reflecting termination of trades and deleveraging activities in our Corporate & Investment Bank. This was partly offset by smaller movements in the categories “Book quality” and “Foreign exchange movements”.

Article 439 (e) CRR - CCR exposures after credit risk mitigation

The following tables present information on our counterparty credit risk (CCR) exposure and the impact of netting and collateral held as well as the composition of collateral used in both derivatives transactions and securities financing transactions (SFT).

Table EU CCR5-A below provides the gross positive fair values before any credit risk mitigation, the impact of legally enforceable master netting agreements as well as further reduction of our CCR exposure due to eligible collateral we have received. Given the nature of the internal model method (IMM) that we use for the measurement of the majority of our derivatives and SFT, the simulation process of future market values across all asset classes includes, if applicable, the impact from regulatory netting and collateralization. Therefore the net credit exposure disclosed below differs from the regulatory exposure value at default (EaD).

EU CCR5-A – Impact of netting and collateral held on exposure values

| | Dec 31, 2018 | | | | |
|-------------------------------------|--|------------------|--------------------------------|-----------------|---------------------|
| | a | b | c | d | e |
| in € m. | Gross positive fair value or net carrying amount | Netting benefits | Netted current credit exposure | Collateral held | Net credit exposure |
| 1 Derivatives | 353,424 | 278,622 | 74,802 | 66,917 | 7,885 |
| 2 Securities Financing Transactions | 495,036 | 393,746 | 101,290 | 8,069 | 93,221 |
| 3 Cross-product netting | 0 | 0 | 0 | 0 | 0 |
| 4 Total | 848,460 | 672,368 | 176,091 | 74,986 | 101,106 |

| | | Jun 30, 2018 | | | | |
|---------|-----------------------------------|--|------------------|--------------------------------|-----------------|---------------------|
| | | a | b | c | d | e |
| in € m. | | Gross positive fair value or net carrying amount | Netting benefits | Netted current credit exposure | Collateral held | Net credit exposure |
| 1 | Derivatives | 375,594 | 300,609 | 74,985 | 68,083 | 6,902 |
| 2 | Securities Financing Transactions | 531,220 | 421,296 | 109,924 | 7,790 | 102,134 |
| 3 | Cross-product netting | 0 | 0 | 0 | 0 | 0 |
| 4 | Total | 906,814 | 721,905 | 184,909 | 75,872 | 109,037 |

Table EU CCR5-B discloses a breakdown of all types of collateral posted or received to support or reduce CCR exposures related to derivatives and SFT. For SFT, collateral refers to both legs of the transaction as collateral received and collateral posted.

EU CCR5-B – Composition of collateral for exposures to CCR

| | | Dec 31, 2018 | | | | | |
|-------------------|--|--|----------------|---------------------------------|---------------|-----------------------------------|---------------------------------|
| | | a | b | c | d | e | f |
| | | Collateral used in derivative transactions | | | | Collateral used in SFTs | |
| | | Fair value of collateral received | | Fair value of posted collateral | | | |
| in € m. | | Segregated | Unsegregated | Segregated | Unsegregated | Fair value of collateral received | Fair value of posted collateral |
| Cash | | 2,120 | 72,442 | 15 | 49,823 | 152,633 | 189,381 |
| Bonds | | 1,776 | 24,655 | 818 | 16,094 | 157,517 | 141,715 |
| Equity securities | | 156 | 10,115 | 0 | 0 | 146,983 | 158,645 |
| Other collateral | | 4,219 | 551 | 4,432 | 0 | 6,389 | 5,294 |
| Total | | 8,272 | 107,764 | 5,265 | 65,917 | 463,521 | 495,036 |

| | | Jun 30, 2018 | | | | | |
|-------------------|--|--|----------------|---------------------------------|---------------|-----------------------------------|---------------------------------|
| | | a | b | c | d | e | f |
| | | Collateral used in derivative transactions | | | | Collateral used in SFTs | |
| | | Fair value of collateral received | | Fair value of posted collateral | | | |
| in € m. | | Segregated ¹ | Unsegregated | Segregated | Unsegregated | Fair value of collateral received | Fair value of posted collateral |
| Cash | | 0 | 99,926 | 0 | 64,988 | 168,505 | 188,573 |
| Bonds | | 0 | 30,410 | 4,149 | 15,521 | 152,441 | 153,714 |
| Equity securities | | 0 | 11,607 | 1,117 | 8 | 186,833 | 176,753 |
| Other collateral | | 0 | 4,650 | 3,870 | 54 | 8,855 | 12,181 |
| Total | | 0 | 146,593 | 9,137 | 80,570 | 516,634 | 531,220 |

¹ Based on process enhancements the "segregated" portion of the collateral received exposure could be firstly identified for yearend 2018.

For further details on derivative exposure please also refer to our Annual Report 2018 table "Maximum exposure to credit risk" on page 105 and table "Credit exposure from derivatives" on page 120.

Article 439 (g-h) CRR - Credit derivatives exposures

The table below discloses the exposure of the credit derivative transactions split into the part held in the regulatory banking book, which is shown under the heading "credit derivative hedges" and the part held in the regulatory trading book, referred to as "other credit derivatives" as well as a split into product types.

EU CCR6 – Credit derivatives exposures

| | | Dec 31, 2018 | | | Jun 30, 2018 | | |
|--------------------|----------------------------------|--------------------------|-----------------|--------------------------|--------------------------|-----------------|--------------------------|
| | | a | b | c | a | b | c |
| | | Credit derivative hedges | | | Credit derivative hedges | | |
| in € m. | | Protection bought | Protection sold | Other credit derivatives | Protection bought | Protection sold | Other credit derivatives |
| Notionals | | | | | | | |
| | Single-name credit default swaps | 8,641 | 279 | 265,744 | 10,180 | 242 | 306,925 |
| | Index credit default swaps | 0 | 0 | 531,065 | 0 | 0 | 686,207 |
| | Total return swaps | 0 | 0 | 10,055 | 0 | 43 | 6,195 |
| | Credit options | 0 | 0 | 34,363 | 0 | 0 | 37,776 |
| | Total notionals | 8,641 | 279 | 841,227 | 10,180 | 285 | 1,037,103 |
| Fair values | | | | | | | |
| | Positive fair value (asset) | 182 | 14 | 8,253 | 136 | 22 | 11,736 |
| | Negative fair value (liability) | 118 | 24 | 8,169 | 166 | 88 | 11,902 |

The drop of credit derivatives exposures in the second half of 2018 to € 0.8 trillion from € 1.0 trillion was primarily driven by the overall rationalisation and complexity reduction in CIB.

Article 439 (i) CRR - Estimate of alpha factor

Under the internal model method (IMM) approach EAD is then finally calculated as the product of EPE and a multiplier 'Alpha' (α). The scaling factor alpha is applied in order to correct for amongst others correlations between parties, concentration risk and to account for the level of volatility/correlation that might coincide with a downturn. Deutsche Bank received regulatory approval to use its own calibrated alpha factor, however, for our regulatory capital calculation the regulatory minimum level of 1.2 has to be applied. For the small population of transactions for which a simulation cannot be computed or is subject to regulatory restrictions (such as for those with risk factors not approved by BaFin or for specific wrong-way risk), the EAD used is derived from the mark-to-market method according to Article 274 CRR.

Economic capital usage for credit risk

The table below provides the economic capital usage for credit risk broken down by business areas.

Economic capital usage for credit risk per business area

| in € m. | Dec 31, 2018 | Dec 31, 2017 | 2018 increase (decrease) from 2017 | |
|-----------------------------|---------------|---------------|------------------------------------|------------|
| | | | in € m. | in % |
| Corporate & Investment Bank | 6,340 | 6,519 | (179) | (3) |
| Private & Commercial Bank | 3,537 | 3,596 | (60) | (2) |
| Asset Management | 52 | 62 | (10) | (16) |
| Corporate & Other | 681 | 591 | 89 | 15 |
| Total | 10,610 | 10,769 | (159) | (1) |

The economic capital usage for credit risk was € 0.2 billion or 1 % lower as of December 31, 2018 compared to year-end 2017 mainly due to a lower counterparty credit risk component and smaller increases in settlement and transfer risk components. The change in counterparty credit risk is mainly due to reductions in exposures from derivatives and securities financing transactions, partly offset by increases in lending, whereas the increases for settlement and transfer risk are largely driven by model overlays related to changes in methodology.

Market risk

Own funds requirements for market risk under the standardized approach

Article 445 CRR - Market Risk Standardized Approach

As of December 31, 2018, the securitization positions, for which the specific interest rate risk is calculated using the market risk standardized approach, generated capital requirements of € 418 million corresponding to risk weighted-assets of € 5.2 billion. As of June 30, 2018 these positions generated capital requirements of € 326.8 million corresponding to risk weighted-assets of € 4.1 billion. The change in the period is due to increases in inventory.

For nth-to-default credit default swaps the capital requirement was € 2.6 million corresponding to risk weighted-assets of € 33 million as of December 31, 2018, compared with € 1.9 million and € 23.4 million as of June 30, 2018.

The capital requirement for Collective Investment Undertakings under the market risk standardized approach was € 14 million corresponding to risk weighted-assets of € 180 million as of December 31, 2018, compared with € 12 million and € 156 million as of June 30, 2018.

The capital requirement for longevity risk under the market risk standardized approach was € 14 million corresponding to risk-weighted assets of € 180 million as of December 31, 2018, compared with € 13 million and € 167 million as of June 30, 2018.

EU MR1 – Market risk under the standardized approach

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | |
|---|--------------|----------------------|--------------|----------------------|
| | a | b | a | b |
| | RWA | Capital requirements | RWA | Capital requirements |
| Outright products | | | | |
| 1 Interest rate risk (general and specific) | 0 | 0 | 0 | 0 |
| 2 Equity risk (general and specific) ¹ | 144 | 12 | 125 | 10 |
| 3 Foreign exchange risk ² | 125 | 10 | 139 | 11 |
| 4 Commodity risk | 0 | 0 | 0 | 0 |
| 4a Longevity risk | 180 | 14 | 167 | 13 |
| Options | | | | |
| 5 Simplified approach | 0 | 0 | 0 | 0 |
| 6 Delta-plus method | 0 | 0 | 0 | 0 |
| 7 Scenario approach | 0 | 0 | 0 | 0 |
| 8 Securitization (specific risk) ³ | 5,224 | 418 | 4,085 | 327 |
| 9 Total | 5,673 | 454 | 4,516 | 361 |

¹ Equity risk RWA of € 144 million is from collective investment undertakings.

² Foreign Exchange risk RWA includes € 89 million from the former Postbank portfolio and € 36 million from collective investment undertakings.

³ Securitization RWA of € 5,224 million includes the nth to default component.

Qualitative information on the internal model approach

Article 455 (a)(i) CRR - Characteristics of the market risk models

Market risk measurement

Market Risk Management aims to accurately measure all types of market risks by a comprehensive set of risk metrics reflecting economic and regulatory requirements.

In accordance with economic and regulatory requirements, we measure market and related risks using several key risk metrics:

Internally developed market risk models

- Value-at-risk (“VaR”) and stressed value-at-risk (“SVaR”), including CVA VaR and SVaR
- Incremental risk charge

- Comprehensive risk measure (decommissioned for regulatory purposes within the fourth quarter 2018 based on ECB approval)

Market risk standardized approaches

- Market Risk Standardized Approach (“MRSA”), applied to investment funds with no look through, MRSA-eligible securitizations and positions subject to longevity risk

Stress testing measures

- Portfolio stress testing
- Business-level stress testing
- Event risk scenarios

Economic capital measures

- Market risk economic capital, including traded default risk

Other model derived and market observable metrics

- Sensitivities
- Market value/notional (concentration risk)
- Loss given default

These measures are viewed as complementary to each other and in aggregate define the market risk framework, by which all businesses can be measured and monitored.

Internally developed market risk models

Value-at-Risk (VaR) at Deutsche Bank Group

VaR is a quantitative measure of the potential loss (in value) of Fair Value positions due to market movements that should not be exceeded in a defined period of time and with a defined confidence level.

We calculate VaR using a 99 % confidence level and a one day holding period. This means we estimate there is a 1 in 100 chance that a mark-to-market loss from our trading positions will be at least as large as the reported VaR. For regulatory purposes, which include the calculation of our risk-weighted assets, the holding period is ten days.

We use one year of historical market data as input to calculate VaR. The calculation employs a Monte Carlo Simulation technique, and we assume that changes in risk factors follow a well-defined distribution, e.g. normal or non-normal (t, skew-t, Skew-Normal). To determine our aggregated VaR, we use observed correlations between the risk factors during this one year period.

Our VaR model is designed to take into account a comprehensive set of risk factors across all asset classes. Key risk factors are swap/government curves, index and issuer-specific credit curves, funding spreads, single equity and index prices, foreign exchange rates, commodity prices as well as their implied volatilities. To help ensure completeness in the risk coverage, second order risk factors, e.g. CDS index vs. constituent basis, money market basis, implied dividends, option-adjusted spreads and precious metals lease rates are considered in the VaR calculation.

For each business unit a separate VaR is calculated for each risk type, e.g. interest rate risk, credit spread risk, equity risk, foreign exchange risk and commodity risk. For each risk type this is achieved by deriving the sensitivities to the relevant risk type and then simulating changes in the associated risk drivers. “Diversification effect” reflects the fact that the total VaR on a given day will be lower than the sum of the VaR relating to the individual risk types. Simply adding the VaR figures of the individual risk types to arrive at an aggregate VaR would imply the assumption that the losses in all risk types occur simultaneously.

The model incorporates both linear and, especially for derivatives, nonlinear effects through a combination of sensitivity-based and revaluation approaches.

The VaR measure enables us to apply a consistent measure across all of our fair value businesses and products. It allows a comparison of risk in different businesses, and also provides a means of aggregating and netting positions within a portfolio to reflect correlations and offsets between different asset classes. Furthermore, it facilitates comparisons of our market risk both over time and against our daily trading results.

When using VaR estimates a number of considerations should be taken into account. These include:

- The use of historical market data may not be a good indicator of potential future events, particularly those that are extreme in nature. This “backward-looking” limitation can cause VaR to understate future potential losses (as in 2008), but can also cause it to be overstated.
- Assumptions concerning the distribution of changes in risk factors, and the correlation between different risk factors, may not hold true, particularly during market events that are extreme in nature. The one day holding period does not fully capture the market risk arising during periods of illiquidity, when positions cannot be closed out or hedged within one day.
- VaR does not indicate the potential loss beyond the 99th quantile.
- Intra-day risk is not captured.
- There may be risks in the trading or banking book that are partially or not captured by the VaR model.

We are committed to the ongoing development of our internal risk models, and we allocate substantial resources to reviewing, validating and improving them. Additionally, we have further developed and improved our process of systematically capturing and evaluating risks currently not captured in our value-at-risk model. An assessment is made to determine the level of materiality of these risks and material risks are prioritized for inclusion in our internal model. Risks not in value-at-risk are monitored and assessed on a regular basis through our Risk Not In VaR (RNIV) framework.

Stressed Value-at-Risk (SVaR)

We calculate a stressed value-at-risk measure using a 99 % confidence level and a holding period of one day. For regulatory purposes, the holding period is ten days.

Our stressed value-at-risk calculation utilizes the same systems, trade information and processes as those used for the calculation of value-at-risk. The only difference is that historical market data from a period of significant financial stress (i.e., characterized by high volatilities) is used as an input for the Monte Carlo Simulation. The time window selection process for the stressed value-at-risk calculation is based on the identification of a time window characterized by high levels of volatility in the top value-at-risk contributors. The identified window is then further validated by comparing the SVaR results to neighboring windows using the complete DB Group portfolio.

CVA Value-at-Risk/ Stressed Value-at-Risk

The advanced approach CVA risk capital charge is determined by applying the VaR model. First, the exposure profiles are determined based on the internal model method (IMM) or the mark-to-market method. The next step consists in determining the synthetic CVA position based on the exposure profile and other risk parameters such as credit spreads. Based on this information the credit spread sensitivity is then calculated. Eligible CVA hedges are also incorporated and the CVA risk capital charge is determined based on the internal market risk models VaR and Stressed VaR using a 99 % confidence level and a 10-day holding period.

Article 455 (a)(ii) CRR - Incremental risk charge and comprehensive risk measure

Incremental risk charge (“IRC”)

The incremental risk charge is based on our own internal model and is intended to complement the value-at-risk modeling framework. It represents an estimate of the default and rating migration risks of unsecuritized credit products over a one-year capital horizon at a 99.9 % confidence level, employing a constant position approach. We use a Monte Carlo Simulation for calculating incremental risk charge as the 99.9 % quantile of the portfolio loss distribution and for allocating contributory incremental risk charge to individual positions. The model captures the default and migration risk in an accurate and consistent quantitative approach for all portfolios. Important parameters for the incremental risk charge calculation are exposures, recovery rates, maturity, ratings with corresponding default and migration probabilities and parameters specifying issuer correlations.

We calculate the incremental risk charge on a weekly basis. For regulatory reporting purposes, the charge is determined as the higher of the most recent 12 week average of incremental risk charge and the most recent incremental risk charge.

The contributory incremental risk charge of individual positions, which is calculated by expected shortfall allocation, provides the basis for identifying risk concentrations in the portfolio.

Default and rating migration probabilities are defined by rating migration matrices which are calibrated on historical external rating data. Taking into account the trade-off between granularity of matrices and their stability we apply a global corporate matrix and a sovereign matrix comprising the seven main rating non-default states and one default state. Accordingly, issue or issuer ratings from the rating agencies Moody’s, S&P and Fitch are assigned to each position.

To quantify a loss due to rating migration, a revaluation of a position is performed under the new rating. The probability of joint rating downgrades and defaults is determined by the migration and rating correlations of the incremental risk charge model. These correlations are specified through systematic factors that represent geographical regions and industries and are

calibrated on historical rating migration and equity time series. The simulation is based on the assumption of a constant position approach where differences in maturities of long and short positions are taken into account.

As the default state is absorbing, defaulted positions do not generate any further losses from rating migrations. The price risk of defaulted debt is modeled by stochastic recoveries.

Direct validation of the incremental risk charge through back-testing methods is not possible. The charge is subject to validation principles such as the evaluation of conceptual soundness, ongoing monitoring and process and outcome analysis. Model validation relies more on indirect methods including stress tests and sensitivity analyses. Relevant parameters are included in the annual validation cycle established in the current regulatory framework. The incremental risk charge is part of the regular group-wide stress test using the stress testing functionality within our credit engine. Stressed incremental risk charge figures are reported on group level and submitted to the Stress Test Council (STC) and the Enterprise Risk Committee (ERC).

Comprehensive risk measure (“CRM”)

Up to its decommissioning the comprehensive risk measure for the corporate correlation trading portfolio was based on our own internal model. We calculated the comprehensive risk measure based on a Monte Carlo Simulation technique to a 99.9 % confidence level and a capital horizon of one year. Our model was applied to the eligible correlation trading positions where typical products include collateralized debt obligations, nth-to-default credit default swaps, and commonly traded index- and single-name credit default swaps. Re-securitizations or products which referenced retail claims or real estate exposures were not eligible. Furthermore, trades subject to the comprehensive risk measure had to meet minimum liquidity standards to be eligible. The model incorporated concentrations of the portfolio and nonlinear effects via a full revaluation approach.

Comprehensive risk measure was designed to capture defaults as well as the following risk drivers: interest rates, credit spreads, recovery rates, foreign exchange rates and base correlations, index-to-constituent and base correlation basis risks.

Comprehensive risk measure was calculated on a weekly basis. Initially, the eligible trade population within the correlation trading portfolio was identified. Secondly, the risk drivers of the P&L were simulated over a one year time horizon. The trade population was then re-valued under the various Monte Carlo Simulation scenarios and the 99.9 % quantile of the loss distribution was extracted.

The market and position data were collected from front office systems and were subject to quality control. The comprehensive risk measure figures were closely monitored and played a significant role in the management of the correlation trading portfolio. We used three years of historical market data to estimate the risk drivers to the comprehensive risk measure.

In our comprehensive risk measure model the liquidity horizon was set to 12 months, which equals the capital horizon.

In order to maintain the quality of our comprehensive risk measure model we continually monitored the potential weaknesses of this model. Backtesting of the trade valuations and the propagation of single risk factors were carried out on a monthly basis and a quarterly recalibration of parameters was performed. In addition, a series of stress tests had been defined on the correlation trading portfolio where the shock sizes linked into historical distressed market conditions.

An independent model validation team reviewed all quantitative aspects of our CRM model on a regular basis. The review covered, but was not limited to, model assumptions, calibration approaches for risk parameters, and model performance.

For regulatory reporting purposes, the comprehensive risk measure represented the higher of the internal model spot value at the reporting dates, their preceding 12-week average calculation, and the floor, where the floor was equal to 8 % of the equivalent capital charge under the standardized approach securitization framework.

Market risk standardized approach

Market Risk Management monitors exposures and addresses risk issues and concentrations for certain exposures under the specific Market Risk Standardized Approach (“MRSA”). We use the MRSA to determine the regulatory capital charge for the specific market risk of trading book securitizations (see section “Article 449 (h) CRR - RWA calculation approaches for securitization positions” and therein section “Calculation of regulatory capital requirements for trading book securitizations” on page 159).

We also use the MRSA to determine the regulatory capital charge for longevity risk as set out in CRR/CRD 4 regulations. Longevity risk is the risk of adverse changes in life expectancies resulting in a loss in value on longevity linked policies and transactions. For risk management purposes, stress testing and economic capital allocations are also used to monitor and manage longevity risk.

Furthermore, certain types of investment funds require a capital charge under the MRSA. For risk management purposes, these positions are also included in our internal reporting framework.

Article 455 (a)(iii) CRR - Market risk stress testing

Stress testing is a key risk management technique, which evaluates the potential effects of extreme market events and extreme movements in individual risk factors. It is one of the core quantitative tools used to assess the market risk of Deutsche Bank's positions and complements VaR and Economic Capital. Market Risk Management performs several types of stress testing to capture the variety of risks: Portfolio Stress Testing, individual specific stress tests, Event Risk Scenarios, and also contributes to Group-wide stress testing. These are also set at varying severities ranging from extreme for capital adequacy assessment to mild for earning stability purposes.

Portfolio Stress Testing measures the profit and loss impact of potential market events based on a broad range of historical or hypothetical macro-economic scenarios considered to be severe and plausible. It is used to manage systemic tail risk and informs on earnings stability and capital resilience. Ad-hoc stress tests are regularly designed to manage risk in advance of and during key events or to focus on a particular area of interest.

For individual specific stress tests, market risk managers identify relevant risk factors and develop stress scenarios relating either to macro-economic or business-specific developments. Specific stress tests capture idiosyncratic and basis risks.

Event risk scenario measures the profit and loss impact of historically observable events or hypothetical situations on trading positions for specific emerging market countries and regions. The bank's trading book exposure to an individual country is stressed under a single scenario, which replicates market movements across that country in times of significant market crisis and reduced liquidity.

In addition, Market Risk Management participates in the Group-wide stress test process, where macro-economic scenarios are defined by ERM Risk Research and each risk department translates that same scenario to the relevant shocks required to apply to their portfolio. This includes credit, market and operational risks.

Tail risk or the potential for extreme loss events beyond reported value-at-risk is captured via stress testing, stressed value-at-risk, economic capital, incremental risk charge and comprehensive risk measure.

Article 455 (a)(iv) CRR - Methodology for backtesting and model validation

Regulatory backtesting of trading market risk

We continually analyze potential weaknesses of our value-at-risk model using statistical techniques, such as backtesting, and also rely on risk management experience.

Backtesting is a procedure used to assess the predictive accuracy of the value-at-risk calculations involving the comparison of hypothetical daily profits and losses under the buy-and-hold assumption ('daily buy-and hold income') to the daily value-at-risk. Under this assumption we estimate the P&L impact that would have resulted on a portfolio for a trading day valued with current market prices and parameters assuming it had been left untouched for that day and compare it with the estimates from the value-at-risk model from the preceding day. Our calculation of hypothetical daily profits and losses (buy & hold income) excludes gains and losses from intraday trading, fees and commissions, carry (including net interest margins), reserves and other miscellaneous revenues. An outlier is a hypothetical buy-and-hold trading loss that exceeds our value-at-risk from the preceding day. On average, we would expect a 99 % confidence level to give rise to two to three outliers representing 1 % of approximately 260 trading days in any one year. We analyze and document underlying reasons for outliers and classify them either as due to market movements, risks not included in our value-at-risk model, model or process shortcomings. We use the results for further enhancement of our value-at-risk methodology. Formal communications explaining the reasons behind any outlier on Group level are provided to the BaFin and the ECB.

In addition to the standard backtesting analysis at the value-at-risk quantile, the value-at-risk model performance is further verified by analyzing the distributional fit across the whole of the distribution (full distribution backtesting). Regular backtesting is also undertaken on hypothetical portfolios to test value-at-risk performance of particular products and their hedges.

There are various Backtesting forums, with participation from Market Risk Management, Market Risk Analysis, Model Validation, and Finance, that regularly review backtesting results as a whole and of individual businesses. They analyze performance fluctuations and assess the predictive power of our value-at-risk model, which allows us to improve and adjust the risk estimation process accordingly.

An independent model validation team reviews all quantitative aspects of our Value-at-Risk model on a regular basis. The review covers, but is not limited to, model assumptions, calibration approaches for risk parameters, and model performance.

Holistic validation process

The Holistic Validation (“HV”) process provides a comprehensive assessment of the market risk management framework across four key control areas: Backtesting, Process, Model Validation, and Risks not in Model (e.g. Risks not in VaR). The HV process is run on a quarterly basis and consists of preparing detailed reports (HV Control Packs & Dashboards) that include both quantitative and qualitative Key Performance Indicator (“KPI”) based assessments across these four key control areas. Reports are produced for VaR, EC and PST across asset classes / global business areas (e.g. Core Rates, Global Credit Trading, Global Markets-Equities), capital & risk measures (CRM, CVA, IMM and IRC) and as regional cuts (APAC, Americas / US-IHC). The associated formal quarterly HV governance framework is as follows:

- Level 1: A series of asset-class level HV Control Pack Review meetings (chaired by the respective Market Risk Management Asset Class Head or delegate), at which the respective HV Control Pack is reviewed and the HV Dashboard KPI status and associated commentary / “path-to-green” agreed across all key control areas.
- Level 2: The HV Governance Council (HVGC) chaired by the Global Head of Market Risk Management (with the MRM ExCo in attendance) at which HV dashboards and key themes are presented by the respective Market Risk Management Asset Class Heads. Key decisions and outputs from the HVGC include finalizing the overall HV Dashboard status, executive summaries and overall themes, and prioritizing issues for remediation and agreeing escalations, if any.
- Level 3: Top-level HV governance is achieved via the Global Head of MRM summarizing key themes to the Group Risk Committee (GRC) on a case-by-case basis. The CRO may optionally present to the Management Board themes and results deemed of sufficient importance. The Supervisory Board may also be kept informed by Office of the Chief Risk Officer (OCRO) via summarized briefings.

At yearend 2018, our value-at-risk and stressed value-at-risk multiplier was at 4.0 versus the regulatory floor of three.

Article 455 (b) CRR - Regulatory approval for market risk models

Our value-at-risk for the trading businesses is based on our own internal model. In October 1998, the German Banking Supervisory Authority (now the BaFin) approved our internal model for calculating the regulatory market risk capital for our general and specific market risks. Since then the model has been continually refined and approval has been maintained.

We also have received approval to use the other internally-developed models described above in the calculation of regulatory capital: SVaR (including CVA VaR and SVaR), Incremental Risk Charge as well as Comprehensive Risk Measure, where the latter has been decommissioned in 2018 based on respective ECB approval.

Article 455 (c) CRR - Trading book allocation and prudent valuation

Allocation of positions to the regulatory trading book

For European regulatory purposes all our positions must be assigned to either the trading book or the banking book. This classification of a position impacts its regulatory treatment, in particular the calculation of the regulatory capital charges for the position. We define the criteria for the allocation of positions to either the trading book or banking book in internal policy documents, which were based on the respective requirements applicable to the Group contained in Articles 102 to 106 of the CRR.

A central function in Finance is responsible for the policy guidance and is the center of competence with regard to questions concerning its application. The Finance functions for the individual business areas are responsible for the classification of positions in line with the policy requirements.

We include positions in the trading book that are financial instruments or commodities which are held with trading intent or which are held for the purpose of hedging other trading book positions.

Positions included in the trading book must be free of any restrictive covenants regarding their transferability or able to be hedged.

Moreover, positions assigned to the trading book must be valued daily. Further information on the valuation methodology that we used is provided in our Annual Report 2018, Note 13 “Financial instruments carried at fair value”, page 273.

As part of the ongoing procedures to confirm that the inclusion of positions in the trading book continues to be in line with the above referenced internal policy guidance, the Finance functions for our trading businesses carry out a global review of the classification of positions on a quarterly basis. The results of the review are documented and presented to the Trading Book Review Forum with representatives from Finance and Legal.

Re-allocations of positions between the trading book and the banking book may only be carried out in line with the internal policy guidance. They must be documented and are subject to approval by the heads of the Finance functions for the respective business areas.

Regulatory prudent valuation of assets carried at fair value

Pursuant to Article 34 CRR institutions shall apply the prudent valuation requirements of Article 105 CRR to all assets measured at fair value and shall deduct from CET 1 capital the amount of any additional value adjustments necessary.

We determined the amount of the additional value adjustments based on the methodology defined in the Commission Delegated Regulation (EU) 2016/101.

As of December 31, 2018 the amount of the additional value adjustments was € 1.5 billion. The December 31, 2017 amount was € 1.2 billion. The increase was largely driven by methodology enhancements throughout the year, with remaining impacts from changes in underlying risk exposures and market data moves.

As of December 31, 2018 the reduction of the expected loss from subtracting the additional value adjustments was € 45 million, which partly mitigated the negative impact of the additional value adjustments on our CET 1 capital.

Own funds requirements for market risk under the IMA

Article 455 (e) CRR - Regulatory capital requirements for market risk

The table below presents all internal model-related components relevant for the capital requirement calculation for market risk. Further details on the movements on the various components can be found in the section "Development of risk-weighted assets" on page 96 of our Annual Report 2018.

EU MR2-A – Market Risk under the internal models approach (IMA)

| in € m. | Dec 31, 2018 | | Jun 30, 2018 | |
|--|--------------|----------------------|--------------|----------------------|
| | a | b | a | b |
| | RWA | Capital requirements | RWA | Capital requirements |
| 1 VaR (higher of values a and b) | 5,368 | 429 | 4,614 | 369 |
| a) Previous day's VaR (Article 365(1) (VaRt-1)) | – | 118 | – | 97 |
| b) Average of the daily VaR (Article 365(1)) on each of the preceding sixty business days (VaRavg) x multiplication factor ((mc) in accordance with Article 366) | – | 429 | – | 369 |
| 2 SVaR (higher of values a and b) | 16,426 | 1,314 | 13,908 | 1,113 |
| a) Latest SVaR (Article 365(2) (sVaRt-1)) | – | 347 | – | 326 |
| b) Average of the SVaR (Article 365(2) during the preceding sixty business days (sVaRavg) x multiplication factor (ms) (Article 366) | – | 1,314 | – | 1,113 |
| 3 Incremental risk charge -IRC (higher of values a and b) | 10,068 | 805 | 7,335 | 587 |
| a) Most recent IRC value (incremental default and migration risks calculated in accordance with Article 370 and Article 371 of the CRR) | – | 805 | – | 551 |
| b) Average of the IRC number over the preceding 12 weeks | – | 694 | – | 587 |
| 4 Comprehensive Risk Measure – CRM (higher of values a, b and c) | 0 | 0 | 64 | 5 |
| a) Most recent risk number for the correlation trading portfolio (article 377 of the CRR) | – | 0 | – | 3 |
| b) Average of the risk number for the correlation trading portfolio over the preceding 12-weeks | – | 0 | – | 5 |
| c) 8 % of the own funds requirement in SA on most recent risk number for the correlation trading portfolio (Article 338(4) of the CRR) | – | 0 | – | 0 |
| 5 Other | 0 | 0 | 0 | 0 |
| 6 Total | 31,862 | 2,549 | 25,921 | 2,074 |

The following table EU MR2-B provides an analysis of key drivers for movements observed for market risk RWA covered by internal models (i.e. value-at-risk, stressed value-at-risk, incremental risk charge and comprehensive risk measure) in the current and previous reporting period. It also shows the corresponding movements in capital requirements, derived from the RWA by an 8 % capital ratio.

EU MR2-B – RWA flow statements of market risk exposures under the IMA

| | | Three months ended Dec 31, 2018 | | | | | | |
|----------|--|---------------------------------|---------------|---------------|------------------------------------|----------|---------------|-------------------------------|
| | | a | b | c | d | e | f | g |
| in € m. | | VaR | SVaR | IRC | Compre- hensive risk measure | Other | Total RWA | Total capital requirements |
| 1 | Market Risk RWA opening balance ¹ | 4,542 | 12,946 | 7,854 | 53 | 0 | 25,395 | 2,032 |
| 1a | Regulatory adjustment ² | (3,483) | (9,989) | 0 | 0 | 0 | (13,471) | (1,078) |
| 1b | RWA at the previous quarter-end (end of the day) ³ | 1,059 | 2,957 | 7,854 | 53 | 0 | 11,924 | 954 |
| 2 | Movement in risk levels | 245 | 1,317 | 2,214 | 0 | 0 | 3,776 | 302 |
| 3 | Model updates/changes | 80 | 62 | 0 | 0 | 0 | 141 | 11 |
| 4 | Methodology and policy | 0 | 0 | 0 | (53) | 0 | (53) | (4) |
| 5 | Acquisitions and disposals | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Foreign exchange movements | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6a | Market data changes and recalibrations | 86 | 0 | 0 | 0 | 0 | 86 | 7 |
| 7 | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8a | RWA at the end of the reporting period (end of the day) ³ | 1,470 | 4,336 | 10,068 | 0 | 0 | 15,874 | 1,270 |
| 8b | Regulatory adjustment ² | 3,898 | 12,091 | 0 | 0 | 0 | 15,988 | 1,279 |
| 8 | Market Risk RWA closing balance¹ | 5,368 | 16,426 | 10,068 | 0 | 0 | 31,862 | 2,549 |

¹ Represents RWA at previous and current reporting period quarter end.

² Indicates the difference between RWA and RWA (end of day) at the beginning and end of period.

³ For a given component (e.g. VaR) it refers to the RWA that would be computed if the previous or current quarter end snapshot figure of the component determines the quarter end RWA, as opposed to a 60-day average for regulatory purposes.

| | | Three months ended Sep 30, 2018 | | | | | | |
|----------|--|---------------------------------|---------------|--------------|------------------------------------|----------|---------------|-------------------------------|
| | | a | b | c | d | e | f | g |
| in € m. | | VaR | SVaR | IRC | Compre- hensive risk measure | Other | Total RWA | Total capital requirements |
| 1 | Market Risk RWA opening balance ¹ | 4,614 | 13,908 | 7,335 | 64 | 0 | 25,921 | 2,074 |
| 1a | Regulatory adjustment ² | (3,403) | (9,834) | (451) | (30) | 0 | (13,719) | (1,098) |
| 1b | RWA at the previous quarter-end (end of the day) ³ | 1,211 | 4,074 | 6,883 | 34 | 0 | 12,202 | 976 |
| 2 | Movement in risk levels | (146) | (1,152) | 891 | 19 | 0 | (388) | (31) |
| 3 | Model updates/changes | (10) | 36 | 80 | 0 | 0 | 106 | 8 |
| 4 | Methodology and policy | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Acquisitions and disposals | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Foreign exchange movements | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6a | Market data changes and recalibrations | 4 | 0 | 0 | 0 | 0 | 4 | 0 |
| 7 | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8a | RWA at the end of the reporting period (end of the day) ³ | 1,059 | 2,957 | 7,854 | 53 | 0 | 11,924 | 954 |
| 8b | Regulatory adjustment ² | 3,483 | 9,989 | 0 | 0 | 0 | 13,471 | 1,078 |
| 8 | Market Risk RWA closing balance¹ | 4,542 | 12,946 | 7,854 | 53 | 0 | 25,395 | 2,032 |

¹ Represents RWA at previous and current reporting period quarter end.

² Indicates the difference between RWA and RWA (end of day) at the beginning and end of period.

³ For a given component (e.g. VaR) it refers to the RWA that would be computed if the previous or current quarter end snapshot figure of the component determines the quarter end RWA, as opposed to a 60-day average for regulatory purposes.

The market risk RWA movements due to position changes are represented in line "Movement in risk levels". Changes to our market risk RWA internal models, such as methodology enhancements or risk scope extensions, are included in the category of "Model updates/changes". In the "Methodology and policy" category we reflect regulatory driven changes to our market risk RWA models and calculations. Significant new businesses and disposals would be assigned to the line item "Acquisition and disposals". The impacts of "Foreign exchange movements" are only calculated for comprehensive risk measure. For the other measures this is captured in "Movements in risk levels". Changes in market data levels, volatilities, correlations, liquidity and ratings are included under the "Market data changes and recalibrations" category.

As of December 31, 2018 the RWA for market risk was € 37.5 billion. The IMA (Internal Models Approach) components of this totaled € 31.9 billion. The increase in the IMA component since September 30, 2018 was driven by an increase in risk levels coming from the incremental risk charge and stressed value-at-risk components. The internal model comprehensive risk measure was decommissioned in the fourth quarter of 2018 following regulatory approval. The small remaining exposures captured by this model are now covered by the incremental risk charge and the market risk standardized approach.

Other quantitative information for market risk under the internal models approach

Article 455 (d) CRR - Overview of Value-at-Risk Metrics

The following table, EU MR3, displays the maximum, minimum, average and the ending for the reporting period values resulting from the different types of models. This table is based on the spot values of the metrics as opposed to the regulatory defined calculation (e.g. not considering any comparisons between spot and average values used in the actual RWA calculations). The VaR and SVaR are both ten day values and this has been calculated using a square root of ten conversion from the one day value.

Further details on the movements on the various components can be found in the section "Trading market risk exposures" on page 136 of the Annual Report 2018.

EU MR3 – IMA values for trading portfolios¹

| in € m. | | Dec 31, 2018 | Jun 30, 2018 |
|---|---------------|--------------|--------------|
| | | a | a |
| VaR (10 day 99 %) | | | |
| 1 | Maximum value | 118.7 | 129.2 |
| 2 | Average value | 88.2 | 85.6 |
| 3 | Minimum value | 71.9 | 62.5 |
| 4 | Period end | 101.6 | 82.4 |
| SVaR (10 day 99 %) | | | |
| 5 | Maximum value | 394.4 | 358.2 |
| 6 | Average value | 266.8 | 265.1 |
| 7 | Minimum value | 193.7 | 193.6 |
| 8 | Period end | 304.1 | 253.1 |
| IRC (99.9 %) | | | |
| 9 | Maximum value | 610.1 | 746.3 |
| 10 | Average value | 847.6 | 606.5 |
| 11 | Minimum value | 445.9 | 485.7 |
| 12 | Period end | 805.4 | 550.7 |
| Comprehensive risk capital charge (99.9 %) | | | |
| 13 | Maximum value | 4.5 | 5.8 |
| 14 | Average value | 1.8 | 5.2 |
| 15 | Minimum value | 0 | 2.7 |
| 16 | Period end | 0 | 2.7 |

¹ Amounts show the maximum, average and minimum for the preceding six month period.

Article 455 (f) CRR - Weighted average liquidity horizons in market risk models

For information on the weighted average liquidity/capital horizons within our internal market risk models please refer to the section "Article 455 (a)(ii) CRR - Incremental risk charge and comprehensive risk measure" in this report on the page 141.

Article 455 (g) CRR - Comparison of end-of-day VaR measures with one-day changes in portfolio's value

Please refer to our Annual Report 2018, section "Results of regulatory backtesting of trading market risk" on page 138 for further insights into Deutsche Bank's market risk backtesting results – in particular explanations and background on the observed outliers and the related graph EU MR4 – Comparison of VaR estimates with gains/losses.

Economic capital usage for our trading market risk

The economic capital usage for trading market risk increased to €4.0 billion as of December 31, 2018, compared to € 3.8 billion at year-end 2017. The increase was primarily driven by a model enhancement to better capture the tail risk in the stressed period (so called Maximum Likelihood Estimation), which was partly offset by a reduction in the traded default risk component.

Economic capital usage for our nontrading market risk portfolios per business area

Economic capital usage of nontrading portfolios by business division

| in € m. | Dec 31, 2018 | Dec 31, 2017 | 2018 increase (decrease) from 2017 | |
|-----------------------------|--------------|--------------|------------------------------------|------------|
| | | | in € m. | in % |
| Corporate & Investment Bank | 725 | 828 | (103) | (12) |
| Private & Commercial Bank | 1,124 | 1,430 | (306) | (21) |
| Asset Management | 358 | 309 | 49 | 16 |
| Corporate & Other | 4,088 | 4,061 | 27 | 1 |
| Total | 6,295 | 6,628 | (333) | (5) |

Nontrading market risk economic capital usage totaled € 6.3 billion as of December 31, 2018, which is € 0.3 billion, or 5 %, below our economic capital usage at year-end 2017.

The decrease of economic capital usage for Corporate & Investment Bank was mainly driven by accounting methodology change due to IFRS 9 go live resulting in positions move to TMR-EC. The decrease of economic capital usage for Private & Commercial Bank was mainly driven by diversification effects. The increase in economic capital usage in Asset Management was largely driven by diversification effects and market performance with guaranteed funds. The economic capital usage in Corporate & Other was materially unchanged.

Operational risk

Article 446 CRR - Operational risk measurement

We calculate and measure the regulatory and economic capital requirements for operational risk using the Advanced Measurement Approach (“AMA”) methodology. Our AMA capital calculation is based upon the loss distribution approach. Gross losses from historical internal and external loss data (Operational Riskdata eXchange Association consortium data) and external scenarios from a public database (IBM OpData) complemented by internal scenario data are used to estimate the risk profile (i.e., a loss frequency and a loss severity distribution). Our loss distribution approach model includes conservatism by recognizing losses on events that arise over multiple years as single events in our historical loss profile.

Within the loss distribution approach model, the frequency and severity distributions are combined in a Monte Carlo simulation to generate potential losses over a one year time horizon. Finally, the risk mitigating benefits of insurance are applied to each loss generated in the Monte Carlo simulation. Correlation and diversification benefits are applied to the net losses in a manner compatible with regulatory requirements to arrive at a net loss distribution at Group level, covering expected and unexpected losses. Capital is then allocated to each of the business divisions after considering qualitative adjustments and expected loss.

The regulatory capital requirement for operational risk is derived from the 99.9 % percentile. Since Q4 2017, the economic capital is also set at 99.9 % percentile, see the section “Internal Capital Adequacy”. Both regulatory and economic capital requirements are calculated for a time horizon of one year.

The regulatory and economic capital demand calculations are performed on a quarterly basis. Non-Financial Risk Management (NFRM) aims to ensure that for the approach for capital demand quantification appropriate development, validation and change governance processes are in place, whereby the validation is performed by an independent validation function and in line with the Group’s model risk management process.

Drivers for operational risk capital development

In 2018, our total operational risk losses further decreased but continued to be predominantly driven by losses and provisions arising from civil litigation and regulatory enforcement. Such losses still make up 67 % of operational risk losses and account for the majority of operational risk regulatory and economic capital demand, which is more heavily reliant on our long-term loss history. For a description of our current legal and regulatory proceedings, please see section “Current Individual Proceedings” in Note 29 “Provisions” of our Annual Report 2018 on page 310. The operational risk losses from civil litigation and regulatory enforcement decreased by € 380 million or 67 % while our non-legal operational risk losses were € 86 million or 48 % lower compared to 2017.

In view of the relevance of legal risks within our operational risk profile, we dedicate specific attention to the management and measurement of our open civil litigation and regulatory enforcement matters where the bank relies both on information from internal as well as external data sources to consider developments in legal matters that affect the bank specifically but also the banking industry as a whole. Reflecting the multi-year nature of legal proceedings the measurement of these risks furthermore takes into account changing levels of certainty by capturing the risks at various stages throughout the lifecycle of a legal matter.

Conceptually, the bank measures operational risk including legal risk by determining the maximum loss that will not be exceeded with a given probability. This maximum loss amount includes a component that due to the IFRS criteria is reflected in our financial statements and a component that is expressed as regulatory or economic capital demand beyond the amount reflected as provisions within our financial statements.

The legal losses which the bank expects with a likelihood of more than 50 % are already reflected in our IFRS group financial statements. These losses include net changes in provisions for existing and new cases in a specific period where the loss is deemed probable and is reliably measurable in accordance with IAS 37. The development of our legal provisions for civil litigations and regulatory enforcement is outlined in detail in Note 29 “Provisions” of our Annual Report 2018 on page 310.

Uncertain legal losses which are not reflected in our financial statements as provisions because they do not meet the recognition criteria under IAS 37 are expressed as “regulatory or economic capital demand”.

To quantify the litigation losses in the AMA model the bank takes into account historic losses, provisions, contingent liabilities and legal forecasts. Legal forecasts are generally comprised of ranges of potential losses from legal matters that are not deemed probable but are reasonably possible. Reasonably possible losses may result from ongoing and new legal matters which are reviewed at least quarterly by the attorneys handling the legal matters.

We include the legal forecasts in the “Relevant Loss Data” used in our AMA model. Hereby the projection range of the legal forecasts is not restricted to the one year capital time horizon but goes beyond and conservatively assumes early settlement of the underlying losses in the reporting period - thus considering the multi-year nature of legal matters.

Our AMA model validation and quality control concept

We independently validate all our AMA model components including but not limited to scenarios, risk & control assessments, expected loss and relevant loss data individually. The results of the validation are summarized in validation reports and identified issues are followed up for resolution. For example, the validation activities in the past years detected areas of improvement required in our AMA model regarding the selection of NFR appetite metrics and the use of legal forecasts, which are now included in our AMA model. Quality controls are performed for the AMA components requiring data input provided by business divisions and result in capital impact. The AMA components and documentation are challenged and compared across business divisions to help us maintain consistency and adequacy for our capital metrics.

Our operational risk management stress testing concept

We conduct stress testing on a regular basis to complement our AMA methodology, to analyze the impact of extreme macro scenarios on our capital and the profit-and-loss account. It also contains reputational impacts. In 2018, NFRM took part in all firm-wide stress test scenarios and assessed and contributed the impact of operational risk to the various stress levels of the scenarios. The impact of operational risk on macro stress test scenarios has been moderate and remained in the expected range in regards to capital, which is due to the fact that our AMA model already applies a conservative multi-year view on loss sizes (including legal forecasts) even in non-stress mode.

Article 446 CRR - Operational risk exposure

Operational risk – risk profile

Operational risk losses by event type (profit and loss view)

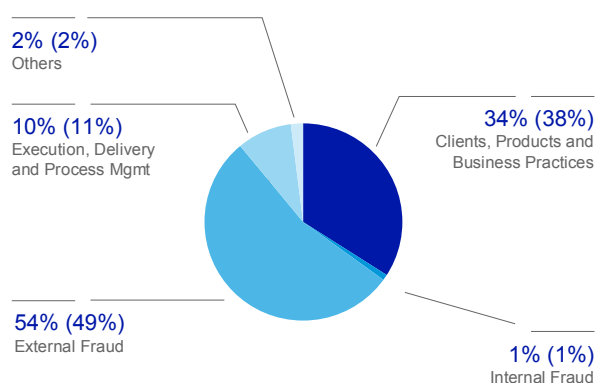
| in € m. | 2018 | 2017 ¹ |
|--|------------|-------------------|
| Clients, Products and Business Practices | 156 | 513 |
| Internal Fraud | 13 | (48) |
| External Fraud | 50 | 19 |
| Execution, Delivery and Process Management | 44 | 224 |
| Others | 19 | 42 |
| Group | 282 | 749 |

¹ Changed 2017 loss figures due to subsequent capture of losses and reclassification.

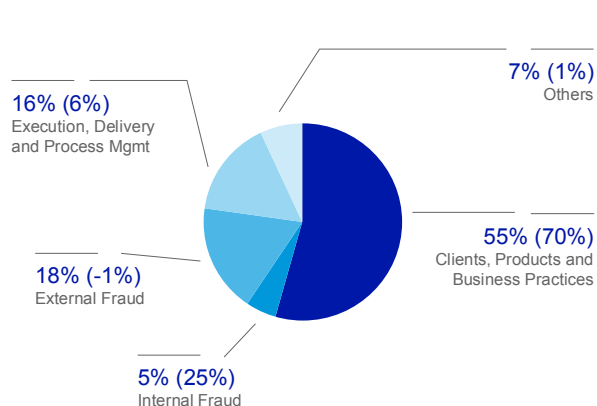
As of December 31, 2018, profit and loss based operational losses decreased by € 467 million or 62 % compared to year-end 2017. The decrease was driven by the event types “Clients, Products and Business Practices” and “Execution, Delivery and Process Management”, due to settlements reached and increased litigation reserves for unsettled cases in 2017.

Operational losses by event type occurred in the period 2018 (2013-2017)¹

Frequency of Operational Losses (first posting date)



Distribution of Operational Losses (posting date)



¹ Percentages in brackets correspond to loss frequency respectively to loss amount for losses occurred in 2013-2017 period. Frequency and amounts can change subsequently.

The above left chart “Frequency of Operational Losses” summarizes operational risk events which occurred in 2018 compared to the five-year period 2013-2017 in brackets based on the period in which a loss was first recognized for that event. For example, for a loss event that was first recognized in 2010 with an additional profit/loss event recognized in 2018, the frequency chart would not include the loss event, but the loss distribution chart would include the profit/loss recognized in the respective period.

Frequencies are driven by the event types “External Fraud” with a frequency of 54 % and the event type “Clients, Products and Business Practices” with 34 % of all observed loss events. “Execution, Delivery and Process Management” contributes 10 %. Others are stable at 2 %. The event type “Internal Fraud” has a low frequency, resulting in less than 1 % of the loss events in the period 2018.

The above right chart “Distribution of Operational Losses” summarizes operational risk loss postings recognized in the profit/loss in 2018 compared to the five-year period 2013-2017. The event type “Clients, Products and Business Practices” dominates the operational loss distribution with a share of 55 % and is determined by outflows related to litigation, investigations and enforcement actions. “External Fraud” has the second highest share (18 %) which is related to one large event in 2018. Finally, the event types “Execution, Delivery and Process Management” (16 %), “Others” (7 %) and “Internal Fraud” (5 %) are minor, compared to other the event types.

While we seek to ensure the comprehensive capture of operational risk loss events with a P&L impact of € 10.000 or greater, the totals shown in this section may be underestimated due to delayed detection and recording of loss events.

Economic capital usage for operational risks

Economic capital usage for operational risk by business division

| in € m. | Dec 31, 2018 | Dec 31, 2017 | 2018 increase (decrease) from 2017 | |
|--|--------------|--------------|------------------------------------|----------|
| | | | in € m. | in % |
| Corporate & Investment Bank | 6,092 | 5,995 | 97 | 2 |
| Private & Commercial Bank | 866 | 932 | (66) | (7) |
| Asset Management | 401 | 402 | (0) | (0) |
| Corporate & Other | 0 | 0 | 0 | N/M |
| Total economic capital usage for operational risk | 7,359 | 7,329 | 30 | 0 |

The operational risk economic capital usage totaled € 7.4 billion as of December 31, 2018, which was € 30 million or 0.4 % higher than the € 7.3 billion economic capital usage as of December 31, 2017. In line with the development of our RWA for operational risk, the increase was driven by several, largely offsetting effects. A lighter loss profile feeding into our capital model and a number of model improvements, mostly from recalibrations of data weights, reduced our capital demand for operational risk. The decrease has been compensated by the development of our expected loss deductible. For a detailed description see the section “Operational risk management” in our 2018 Annual Report on page 78.

Article 454 CRR - Use of the Advanced Measurement Approaches to operational risk

Description of the use of insurances and other risk transfer mechanisms for the purpose of mitigation of this risk

The definition of our insurance strategy and supporting insurance policy and guidelines is the responsibility of our specialized unit Corporate Insurance/Deukona (“CI/D”). CI/D is responsible for our global corporate insurance policy which is approved by our Management Board.

CI/D is responsible for acquiring insurance coverage and for negotiating contract terms and premiums. CI/D also has a role in the allocation of insurance premiums to the businesses. CI/D specialists assist in devising the method for reflecting insurance in the capital calculations and in arriving at parameters to reflect the regulatory requirements. They validate the settings of insurance parameters used in the AMA model and provide respective updates. CI/D is actively involved in industry efforts to reflect the effect of insurance in the results of the capital calculations.

We buy insurance in order to protect ourselves against unexpected and substantial unforeseeable losses. The identification, definition of magnitude and estimation procedures used are based on the recognized insurance principles and methods. The maximum limit per insured risk takes into account the reliability of the insurer and a cost/benefit ratio, especially in cases in which the insurance market tries to reduce coverage by restricted/limited policy wordings and specific exclusions.

We maintain two insurance companies. However, insurance contracts provided are only considered in the modeling/calculation of insurance-related reductions of operational risk capital requirements where the risk is re-insured in the external insurance market.

The regulatory capital figure includes a deduction for insurance coverage amounting to € 315 million as of December 31, 2018 compared with € 311 million as of December 31, 2017. Currently, no other risk transfer techniques beyond insurance are recognized in the AMA model.

CI/D selects insurance partners in strict compliance with the regulatory requirements specified in the CRR and based on recommendations of the respective subject matter experts on the recognition of insurance in advanced measurement approaches. The insurance portfolio, as well as CI/D activities, is audited by Group Audit on a risk-based approach.

Exposures in equities in the banking book

Article 447 (a) CRR - Accounting and valuation of equity investments

Outside of trading, equity investments which are neither consolidated for regulatory purposes nor deducted from our regulatory capital are held as equity positions in the regulatory banking book. Following the implementation of IFRS 9 as of January 1, 2018, equity investments previously classified as financial assets available for sale or financial assets designated at fair value through profit and loss are reported as non-trading financial assets mandatory at fair value through profit and loss (FVTPL). The Group is not reporting these investments at fair value through other comprehensive income.

For details on our accounting and valuation policies related to non-trading financial assets mandatory at FVTPL for equity instruments and investments in associates and joint ventures please refer to Note 1 "Significant accounting policies and critical accounting estimates" on page 223, Note 13 "Financial instruments carried at fair value" on page 273 and Note 18 "Equity method investments" to the consolidated financial statements of our Annual Report 2018 on page 289.

Article 447 (b) CRR - Equity investment exposure

Equity investments according to IFRS classification

| in € m. | Carrying value | |
|--|---------------------------|--------------|
| | Dec 31, 2018 ¹ | Dec 31, 2017 |
| Financial assets available for sale – equity instruments | N/M | 1,019 |
| Exchange-traded positions | N/M | 83 |
| Non-exchange-traded positions | N/M | 936 |
| Equity method investments | 879 | 865 |
| Exchange-traded positions | 0 | 0 |
| Non-exchange-traded positions | 879 | 865 |
| Financial assets mandatory at fair value through profit and loss - equity instruments | 1,956 | N/M |
| Exchange-traded positions | 24 | N/M |
| Non-exchange-traded positions | 1,932 | N/M |
| Financial assets designated at fair value through profit or loss – equity instruments | N/M | 0 |
| Exchange-traded positions | N/M | 0 |
| Non-exchange-traded positions | N/M | 0 |
| Total equity investments | 2,835 | 1,885 |

¹ Equity investment classifications have been impacted by the adoption of IFRS 9. Equity investment and investment funds classified as AFS and FVTPL prior to IFRS 9, are now reported as mandatory at fair value through profit and loss. Financial assets mandatory at FVTPL includes investment fund of € 605 million as of December 31, 2018, which were not provided in the year end 2017 balances.

For equity investments classified as non-trading financial assets mandatory at FVTPL, the components considered are realized gains and losses from sales and liquidations as well as unrealized revaluation gains (losses) and impairments. The balances for investment funds classified as non-trading financial assets mandatory at FVTPL are also considered for December 31, 2018, which were not part of the balances as of December 31, 2017. For equity method investments, the gain and loss elements consist of realized gains and losses from sales and liquidations, pro-rata share of net income (loss), impairments and unrealized revaluation gains (losses) in form of the differences between carrying value and fair value. As of December 31, 2018, a slight excess of € 11.0 million in fair value is observed compared to the carrying value for the investment positions classified as equity method investments.

Article 447 (c) CRR - Types and nature of equity exposures

The tables above and below present IFRS classifications and the gains (losses) for equity investments held. These equity investments principally constitute equity positions in the regulatory banking book or capital deductions according to CRR. However, the following aspects need to be considered when comparing the equity investments held – presented below – with the equity position in the regulatory banking book:

- Entities holding equity investments which are considered for regulatory purposes but not consolidated according to IFRS, do not provide IFRS balance sheet and profit or loss information, and are excluded from these tables. The regulatory exposure value ("EAD") of these excluded equity investments has been zero for December 31, 2018 similar to December 31, 2017.

- Other positions like equity underlying resulting from derivative transactions or certain subordinated bonds which from a regulatory point of view are also assigned to the exposure class “Equity in the banking book” are excluded from the tables. Their EAD amounted to € 60 million as of December 31, 2018 and € 140 million as of December 31, 2017.
- The regulatory equity position includes € 534 million EAD as of December 31, 2018 and € 435 million EAD as of December 31, 2017 in respect of equity investments which are Group-internal from an IFRS perspective.
- “Non-exchange-traded positions” combine private equity exposures in sufficiently diversified portfolios and other exposures according to Article 447 (c) CRR.

For further information on types and nature of these equity investments please refer to our Annual Report 2018, chapter “Market risk management”, section “Equity and investment risk” on page 77.

Article 447 (d-e) CRR - Gains and losses from equity investments

Realized gains (losses) in the reporting period and unrealized gains (losses) at year-end from equity investments

| in € m. | 2018 | 2017 |
|--|--------------|--------------|
| Gains and losses on disposal | 334 | 361 |
| Impairments | (3) | (13) |
| Pro-rata share of net income (loss) | 129 | 141 |
| Total realized gains (losses) from equity investments | 460 | 489 |
| | Dec 31, 2018 | Dec 31, 2017 |
| Unrealized revaluation gains (losses) | 441 | 426 |
| Difference between carrying value and fair value ¹ | 11 | 9 |
| Total unrealized gains (losses) from equity investments | 452 | 435 |

¹ Difference between carrying value and fair value of Equity method investment is newly considered for December 31, 2018, the balances of December 31, 2017 are restated accordingly.

The realized gains (losses) on disposals, the impairments and the pro-rata share of net income (loss) are referring to the reporting period 2018 and 2017 whereas the unrealized revaluation gains (losses) as well as the difference between the carrying values and the fair values for the equity investments represent the amounts as of December 31, 2018, and December 31, 2017.

Exposure to interest rate risk in the banking book (Article 448 CRR)

Please refer to our Annual Report 2018 chapter “Risk and capital management”, section “Nontrading market risk” with its sub-section “Interest rate risk in the banking book” on page 76 as well as to the section “Nontrading market risk exposures” and therein the sub-section “Interest rate risk in the banking book” on page 141.

Exposure to securitization positions

Article 449 (a) CRR - Objectives in relation to securitization activity

We engage in various business activities that use securitization structures. The main purposes are to provide investor clients with access to risk and returns related to specific portfolios of assets, to provide borrowing clients with access to funding and to manage our own credit risk exposure. In order to achieve our business objectives, we act as originator, sponsor and investor on the securitization markets.

Article 4(1)(61) CRR defines which types of transactions and positions must be classified as securitization transactions and securitization positions for regulatory reporting.

Securitization transactions are basically defined as transactions in which the credit risk of a securitized portfolio is divided into at least two securitization tranches and where the payments to the holders of the tranches depend on the performance of the securitized portfolio. The different tranches are in a subordinate relationship that determines the order and the amount of payments or losses assigned to the holders of the tranches (waterfall). Loss allocations to a junior tranche will not already lead to a termination of the entire securitization transaction, i.e., senior tranches survive loss allocations to subordinate tranches.

Securitization positions can be acquired in various forms including investments in securitization tranches, derivative transactions for hedging interest rate and currency risks included in the waterfall, liquidity facilities, credit enhancements, unfunded credit protection or collateral for securitization tranches.

Assets originated or acquired with the intent to securitize follow the general approach for the assignment to the regulatory banking or trading book. Further details are described in chapter "Article 455 (c) CRR - Trading book allocation and prudent valuation", section "Allocation of positions to the regulatory trading book" on page 144 in this report.

Article 449 (b) CRR - Nature of other risks in securitized assets

Similar to other fixed income and credit assets, securitized trading volume is linked to global growth and geopolitical events which affect liquidity and can lead to lower trading volumes, as observed during the crisis. Current changes to regulation and uncertainty over final implementation may lead to increased volatility and decreased liquidity/trading volumes across securitized products. Other potential risks that exist in securitized assets are prepayment, default, loss severity and servicer performance. Note that trading book assets are marked to market and the previous mentioned risks are reflected in the position's price.

Securitization activities have an impact on our liquidity activity. On the one hand, we have entered into securitization transactions as part of an active liquidity risk management strategy during 2008 and 2009, some of which we replaced in 2015 and 2017 with new securitization transactions. On the other hand, we are exposed to potential drawdown under the revolving commitments provided under some of our securitization facilities. This liquidity risk is monitored by our Treasury department and is included in our liquidity planning and regular stress testing.

Article 449 (d-e) CRR - The roles played in the securitization process

In the banking book, we act as originator, sponsor and investor. As an originator we use securitizations primarily as a strategy to reduce credit risk, mainly through the Credit Portfolio Strategies Group ("CPSG"). CPSG uses, among other means, synthetic securitizations to manage the credit risk of loans and lending-related commitments of the Institutional Corporate Credit portfolio (primarily unsecured, investment grade corporates), Leveraged Debt Capital Markets portfolio (primarily secured, non-investment grade corporates) and the German and Dutch MidCap portfolio. In addition CIB, through the Global Transaction Banking division, manages their trade finance exposures separately through synthetic securitizations. For all of the above portfolios, the credit risk is predominantly transferred to counterparties through synthetic securitizations mainly through the issuance of Credit Linked Notes providing first loss protection.

On a limited basis we have entered into securitization transactions as part of an active liquidity risk management strategy during 2008 and 2009, some of which we replaced in 2015 and 2017 with new securitization transactions. These transactions do not transfer credit risk and are therefore not included in the quantitative part of this section.

Within our existing role as sponsor, we continue to establish and manage securitization schemes in which special purpose entities purchase exposures from third-party entities on behalf of investors. In these transactions, we have substantial influence on the selection of the purchased exposures and ultimate composition of the securitized portfolios.

Furthermore, we act as an investor in third party securitizations through the purchase of tranches from third party-issued securitizations, or by providing liquidity, credit support or other form of financing. Additionally, we assist third party securitizations by providing derivatives related to securitization structures. These include currency, interest rate and credit derivatives.

Overall, the securitization positions are exposed to the performance of diverse asset classes, including primarily corporate senior secured loans or unsecured debt, consumer debt such as auto loans or student loans, as well as residential or commercial first and second lien mortgages. We are active across the entire capital structure with an emphasis on the more senior tranches. The subset of re-securitization is predominantly backed by securitizations with corporate obligations in the underlying pools.

In the trading book, we act as originator, sponsor and investor. In the role of investor, our main objective is to serve as a market maker in the secondary market. The market making function consists of providing liquidity for our customers and providing two way markets (buy and sell) to generate flow trading revenues. In the role of originator, we finance loans to be securitized, predominantly in the commercial real estate business. Trading book activities where we have the role of a sponsor (excluding activities derived from multi-seller originator transactions) as described above are minimal.

Our securitization desks trade assets across all capital structures, from senior bonds with large subordination to first loss subordinate tranches, across both securitizations and re-securitizations. Securitization positions consist mostly of residential mortgage backed securities ("RMBS") and commercial mortgage backed securities ("CMBS") backed by first and second lien loans, collateralized loan obligations ("CLOs") backed by corporate senior loans and unsecured debt and consumer ABS backed by secured and unsecured credit.

For further details about the extent of involvement in securitization roles, please also see section "Article 449 (n) CRR - Banking and trading book securitization exposures" and tables from section "(i) - Amount of outstanding exposures securitized" on page 161 of this Pillar 3 report.

Article 449 (c,f) CRR - Management of securitization positions, and risks in re-securitization activities

Management of banking book securitizations

Primary recourse for securitization exposures lies with the underlying assets. The related risk is mitigated by credit enhancement typically in the form of overcollateralization, subordination, reserve accounts, excess interest, or other support arrangements. Additional protection features include performance triggers, financial covenants and events of default stipulated in the legal documentation which, when breached, provide for the acceleration of repayment, rights of foreclosure and/or other remediation.

The initial due diligence for new banking book exposures usually includes any or all of the following, depending on the specifics of the transaction: (a) the review of the relevant documents including term sheets, servicer reports or other historical performance data, third-party assessment reports such as rating agency analysis (if externally rated), etc., (b) modeling of base and downside scenarios through asset-class specific cash-flow models, (c) servicer reviews to assess the robustness of the servicer's processes and financial strength. The result of this due diligence is summarized in a credit and rating review which requires approval by an appropriate level of credit authority, depending on the size of exposure and internal rating assigned.

Compliance with the regulatory requirements for risk retention, due diligence and monitoring according to the applicable regulatory requirements is part of our credit review process and the relevant data is gathered for reporting purposes with the support of the IT systems used for the credit review process and the process for financial reporting

Ongoing regular performance reviews include checks of the periodic servicer reports against any performance triggers/covenants in the loan documentation, as well as the overall performance trend in the context of economic, geographic,

sector and servicer developments. Monitoring of the re-securitization subset takes into consideration the performance of the securitized tranches' underlying assets, to the extent available.

For lending-related commitments an internal rating review is required at least annually. Significant negative or positive changes in asset performance can trigger an earlier review date. Full credit reviews are also required annually, or, for highly rated exposures, every other year. Furthermore, there is a separate, usually quarterly, watch list process for exposures identified to be at a higher risk of loss, which requires a separate assessment of asset and servicer performance. It includes a review of the exposure strategy and identifies next steps to be taken to mitigate loss potential. There is no difference in approach for re-securitization transactions.

Evaluation of structural integrity is another important component of risk management for securitization, focusing on the structural protection of a securitization as defined in the legal documentation (i.e., perfection of security interest, segregation of payment flows, and rights to audit). The evaluation for each securitization is performed by a dedicated team who engages third-party auditors, determines audit scopes, and reviews the results of such external audits. The results of these risk reviews and assessments complement the credit and rating review process performed by Credit Risk Management.

Management of trading book securitizations

Our Market Risk Management Governance Framework applies to all securitization positions held within the trading book. The Risk Governance Framework applied to securitization includes policies and procedures with respect to new product approvals, new transaction approvals, risk models and measurements, as well as inventory management systems and trade entry. All securitization positions held within the trading book are captured, reported and limited within the Risk Governance Framework at the global, regional and product levels. Any changes in credit and market risks are also reported.

The limit structure includes value-at-risk and product specific thresholds. Asset class market value limits are based on seniority/rating and liquidity, where lower rated positions or positions in less liquid asset class are given a lower trading threshold. The limit monitoring system captures exposures and flags any threshold breaches. Market Risk Management approval is required for any trades over the limit or threshold.

The Market Risk Management Governance Framework also captures issuer (credit) risk for securitization positions in the trading book. MRM's process manages concentration risks and sets thresholds at the position level. The limit structure is based on asset class and rating where less liquid positions and those with lower ratings are assigned lower trading thresholds. When the limit monitoring system captures positions that exceed their respective market value thresholds on a global basis, MRM approval is required. Further due diligence is performed on positions that require trade approval; this includes analyzing the credit performance of the security and evaluating risks of the trade. In addition collateral level stress testing and performance monitoring is incorporated into the risk management process. The process covers both securitizations and re-securitizations.

Compliance with the CRR rules, as applicable requires that pre-trade due diligence is performed on all relevant positions. It is the responsibility of the respective trading desk to perform the pre-trade due diligence and then record the appropriate data records at trade execution to indicate whether relevant due diligence items have been performed. The pre-trade due diligence items include confirmations of deal structural features, performance monitoring of the underlying portfolio, and any related retention disclosures.

Product Control group within Finance then reviews trade inputs for errors or flag changes, distributes regulatory control reports and serves as the subject matter escalation contact. Upon validation of flag changes or trading desk errors, the Product Control group within Finance will then communicate and action the changes accordingly. Further pre-trade due diligence is performed by Market Risk Management for CRR, as applicable for relevant positions exceeding predefined limits (process as described above). Please refer to section "Market risk management" on page 72 in our Annual Report 2018 for detailed information on the market risk management framework.

Article 449 (g) CRR - Policies with respect to hedging and unfunded protection

Management of banking book securitizations

Management of credit risk for securitization exposures is conducted primarily through avoidance of undue risk concentration on borrower, servicer and asset class levels. Any higher initial underwritings are de-risked to a final hold mandated in the credit approval mainly through syndication, or sales in the secondary market. Success of de-risking is monitored and reported

regularly to senior management. Credit hedging requirements, if any, are mandated in the context of the individual credit approval. There is only very limited credit hedging activity in the banking book.

Furthermore, in the context of structuring securitization transactions, hedging usually takes place to insulate the special purpose entity (SPE) from interest rate and cross-currency risk – as far as required depending on the assets being included. When this hedging is provided by us, the related counterparty risk to the securitization structure is included in the Credit Risk Management review process and reported as part of the banking book exposure. If this hedging is not provided by us, it is largely conducted with large international financial institutions with strong financial condition. Please refer to the section “Credit risk management” in our Annual Report 2018 on pages 61 for detailed information on the credit risk management framework.

Management of trading book securitizations

The securitization desks incorporate hedges to mitigate credit and interest rate risks on the entire securitization portfolio. Duration and credit sensitivities (DV01s and CS01s) are the primary risk sensitivity measures used to calculate appropriate hedges. Some of the hedging products utilized include plain vanilla interest rate swaps, US Treasury bonds and product specific liquid indices. The market risks of the hedges (both funded and unfunded) are incorporated and managed within our Market Risk Management Governance Framework as described above; and, the counterparty risks of the hedges (both funded and unfunded), which are comprised primarily of major global financial institutions, are managed and approved through a formalized risk management process performed by Credit Risk Management.

For further details, please refer to section “Article 449 (c,f) CRR - Management of securitization positions, and risks in re-securitization activities” above in this Pillar 3 Report on page 156.

Article 449 (h) CRR - RWA calculation approaches for securitization positions

The approach for the calculation of the regulatory capital requirements for banking book and trading book securitization positions is prescribed by the European Capital Requirements Regulation (CRR).

Calculation of regulatory capital requirements for banking book securitizations

The regulatory capital requirements for the credit risk of banking book securitizations are determined based on the securitization framework pursuant to Articles 242 to 270 CRR, which distinguishes between credit risk standardized approach (CRSA)-securitization positions and internal ratings based approach (IRBA)-securitization positions. The classification of securitization positions as either CRSA- or IRBA-securitization positions depends on the nature of the securitized portfolio. Basically, CRSA-securitization positions are those where the securitized portfolio predominantly includes credit risk exposures, which would qualify as CRSA-exposures under the credit risk framework if they would be held by us directly. Otherwise, if the majority of the securitized portfolio would qualify as IRBA-exposures, the securitization positions qualify as IRBA-securitization positions.

The risk weights of CRSA-securitization positions are derived from their relevant external ratings, when applicable. External ratings must satisfy certain eligibility criteria for being used in the risk weight calculation. Eligible external ratings are taken from Standard & Poor's, Moody's, Fitch Ratings, DBRS and Kroll. If more than one eligible rating is available for a specific securitization position, the relevant external rating is determined as the second best eligible rating in accordance with the provisions set forth in Article 269 CRR.

CRSA-securitization positions with no eligible external rating receive a risk weight of 1,250 % unless they qualify for the application of:

- the Internal Assessment Approach according to Article 109 (1) CRR in conjunction with Article 259 (3) and (4) CRR. The Internal Assessment Approach applies to unrated IRBA-securitization positions related to ABCP programs. As we ceased the use of ABCP programs in 2015, there are no securitizations positions subject to the Internal Assessment Approach as of December 31, 2018.
- the risk concentration approach pursuant to Article 253 CRR which might lead to a risk weight below 1,250 %. The risk concentration approach is applied to a few CRSA-securitization exposures that are small compared with the total amount of our banking book securitization exposures.

The risk weight of IRBA-securitization positions is determined according to the following hierarchy:

- If one or more eligible external ratings exist for the IRBA-securitization position, or if an external rating can be inferred from an eligible external rating of a benchmark securitization position, the risk weight is derived from the relevant external rating (ratings based approach).
- Otherwise, if no eligible external rating exists or can be inferred, the risk weight of the IRBA-securitization position will generally be determined based on the supervisory formula approach pursuant to Section 262 CRR or the internal assessment approach pursuant to Article 259 (3) and (4) CRR.
- If neither of the aforementioned approaches can be applied, the position receives a risk weight of 1,250 %.

The ratings based approach applies to approximately 6 % of our IRBA- and CRSA-securitization exposure, largely in the lower (better) risk weight bands. The majority of securitization positions with an eligible external or inferred external credit assessment are securitization positions held as investor.

Approximately 92 % of the total banking book securitization exposure is subject to the supervisory formula approach (SFA). This approach is predominantly used to rate positions backed by corporate loans, auto-related receivables and commercial real estate loans. The risk weight of securitization positions subject to the SFA is determined based on a formula which takes as input the capital requirement of the securitized portfolio and the seniority of the securitization position in the waterfall, amongst others. When applying the SFA, we estimate the risk parameters PD and LGD for the assets included in the securitized portfolio, by using internally developed rating systems approved for such assets. We continue to develop new rating systems for homogenous pools of assets to be applied to assets that have not been originated by us. The rating systems are based on historical default and loss information from comparable assets. The risk parameters PD and LGD are derived on risk pool level.

There is no securitization position for which we have applied the special provisions for originators of securitization transactions which include an investor's interest to be recognized by the originator pursuant to Article 256 CRR respectively Article 265 CRR.

Calculation of regulatory capital requirements for trading book securitizations

The regulatory capital requirements for the market risk of trading book securitizations are determined based on a combination of internal models and regulatory standard approaches pursuant to Article 337 CRR.

The capital requirement for the general market risk of trading book securitization positions is determined as the sum of (i) the value-at-risk based capital requirement for market risk and (ii) the stressed value-at-risk based capital requirement for market risk.

The capital requirement for the specific market risk of trading book securitization positions depends on whether the positions are assigned to the regulatory correlation trading portfolio (CTP) or not.

For securitization positions that are not assigned to the CTP, the capital requirement for specific market risk is calculated based on the market risk standardized approach (MRSA). The MRSA risk weight for trading book securitization positions is generally calculated by using the same methodologies which apply to banking book securitization positions. The only difference relates to the use of the SFA for a small portion of trading book securitization positions, where the capital requirement of the securitized portfolio is determined by making use of risk parameters (probability of default and loss given default) that are based on the incremental risk charge model. The MRSA based capital requirement for specific risk is determined as the sum of the capital requirements for all net long and all net short securitization positions outside of the CTP. The securitization positions included in the MRSA calculations for specific risk are additionally included in the value-at-risk and stressed value-at-risk calculations for specific risk.

Trading book securitizations subject to MRSA treatment include various asset classes differentiated by the respective underlying collateral types:

- Residential mortgage backed securities (RMBS);
- Commercial mortgage backed securities (CMBS);
- Collateralized loan obligations (CLO);
- Collateralized debt obligations (CDO); and
- Asset backed securities (incl. credit cards, auto loans and leases, student loans, equipment loans and leases, dealer floorplan loans, etc).

They also include synthetic credit derivatives and commonly-traded indices based on the above listed instruments.

Conversely, the capital requirement for the specific market risk of securitization positions which were assigned to the CTP was calculated based on the comprehensive risk measurement (CRM) model. The CRM model was decommissioned in the fourth quarter of 2018 following regulatory approval. The small remaining exposures captured by this model are now covered

by the incremental risk charge and the market risk standardized approach. Prior to the model decommission the capital requirements for the CTP were determined as the sum of (i) the value-at-risk based capital requirement for specific risk, (ii) the stressed value-at-risk based capital requirement for specific risk and (iii) the capital requirement for specific risk as derived from the comprehensive risk measurement (CRM) model. The CRM based capital requirement was subject to a floor equal to 8 % of the higher of the specific risk capital requirements for all net long and all net short CTP positions under the MRSA.

The CTP included securitization positions and nth-to-default credit derivatives principally held for the purpose of trading correlation that satisfied the following requirements:

- all reference instruments are either single-name instruments, including single-name credit derivatives for which a liquid two-way market exists, or commonly-traded indices based on those reference entities;
- the positions are neither re-securitization positions, nor options on a securitization tranche, nor any other derivatives of securitization exposures that do not provide a pro-rata share in the proceeds of a securitization tranche; and
- the positions do not reference a claim on a special purpose entity, claims or contingent claims on real estate property or retail.
- The CTP also comprises hedges to the securitization and nth-to-default positions in the portfolio, provided a liquid two-way market exists for the instrument or its underlying. Typical products assigned to the CTP are synthetic CDOs, nth-to-default credit default swaps (CDS), and index and single name CDS.

Please refer to section “Article 455 (a)(i) CRR - Characteristics of the market risk models” on page 139 of this report for general information on our market risk quantification approaches.

Article 449 (i) CRR - SSPEs in sponsoring activities

We occasionally use securitization SPEs to securitize third-party exposures in which we act as sponsor. In certain cases we also retain some of the securitized exposure. The majority (88 %) of our € 1.4 billion sponsor positions consist of senior securitization facilities backed by corporate loans.

When we act as originator or sponsor of a securitization transaction, we sell securitization tranches (or arrange for such sale through mandated market making institutions) solely on an “execution only” basis and only to sophisticated operative corporate clients that rely on their own risk assessment. In the ordinary course of business, we do not offer such tranches to operative corporate clients to which, at the same time, we offer investment advisory services.

Our division Asset Management (“AM”) provides asset management services to undertakings for collective investments, including mutual funds and alternative investment funds, and private individuals offering access to traditional and alternative investments across all major asset classes, including securitization positions. Less than 4 % of those positions consist of tranches in securitization transactions where Deutsche Bank acted as originator or sponsor.

Article 449 (j) CRR - Accounting policies for securitizations

Our accounting policies are included in our Annual Report 2018, specifically Note 1 “Significant accounting policies and critical accounting estimates” on page 223. The most relevant accounting policies for the securitization programs originated by us, and where we hold assets purchased with the intent to securitize, are “Principles of consolidation” on page 224, “Financial assets” on page 229-233 and “Financial liabilities” on page 233-234 and “Derecognition of financial assets and liabilities” on page 241, see also Note 13 “Financial instruments carried at fair value” on page 273. For measurement and quantification of both our banking and trading book securitizations, please refer to section “Article 449 (n) CRR - Banking and trading book securitization exposure” on page 161 further below in this report.

Article 449 (k) CRR - External rating agencies used for securitizations

Please refer for all the used External rating agencies (ECAIs) to the section “Article 449 (h) CRR - RWA calculation approaches for securitization positions” in this Pillar 3 report on page 158.

Article 449 (l) CRR - Internal Assessment Approach

Please refer for a full description of the Internal Assessment Approach to the section "Article 449 (h) CRR - RWA calculation approaches for securitization positions" on page 158 in this Pillar 3 report.

Article 449 (m) CRR - Explanation of changes in quantitative disclosures

Explanations of changes in quantitative disclosures can be found above and below of every quantitative table in the securitization section.

Article 449 (n) CRR - Banking and trading book securitization exposures

(i) - Amount of outstanding exposures securitized

The amounts reported in the following tables provide details of our securitization exposures separately for the regulatory banking and trading book. The details of our trading book securitization positions subject to the market risk standardized approach (MRSA) are included in this chapter, while the internal model comprehensive risk measure was decommissioned in the fourth quarter of 2018. Remaining exposures captured by this model are considered by the incremental risk charge and the market risk standardized approach as described in the section "Article 455 (e) CRR – Regulatory capital requirement for market risk" on page 145 in this report.

We are only exposed to credit or market risks related to the exposures securitized, as shown below, to the extent that we have retained or purchased any of the related securitization positions. The risk of the retained or purchased positions depends on the relative position in the payment waterfall structure of the securitization transaction. For disclosure purposes, we are deemed to be originator and additionally sponsor in case of multi-seller securitizations, which is reflected in the disclosure of the total outstanding exposures securitized in the sponsor column and our share of those exposures in the originator column.

The following table details the total banking book outstanding exposure split by exposure type, i.e., the overall pool size, we have securitized in our capacity as either originator or sponsor through traditional or synthetic securitization transactions. Within the originator columns the table provides information of the underlying securitized asset pool which was either originated from our balance sheet or acquired from third parties. The amounts reported are the principal notional amounts with the exception of on-balance sheet synthetic securitizations for which the carrying values as reported in our consolidated financial statements are shown. Of the € 44.1 billion total outstanding securitized exposure reported as of December 31, 2018 in the table below as originator, the amount retained was € 35.5 billion reflecting a decrease in both outstanding securitized as well as retained exposures due to a positive FX impact and lower business volume in our synthetic banking book positions. For December 31, 2017 these exposures amounted to € 44.8 billion and € 36.1 billion respectively.

For sponsor relationships, the total outstanding exposure securitized reported in the table below represents the principal notional amount of outstanding exposures of the entities issuing the securities and other receivables. As of December 31, 2018, our retained or re-purchased exposure of the € 10.3 billion total outstanding exposure securitized shown in the sponsor columns including multi-seller transactions was € 1.4 billion. The remaining exposure is held by third parties. As of December 31, 2017, our total outstanding exposure securitized resulting from sponsoring activities amounted to € 9.7 billion. This included the retained or re-purchased exposure from multi-seller transactions in the amount of € 1.4 billion.

Outstanding exposures securitized by exposure type (overall pool size) within the banking book

| in € m. | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|--|--------------|---------------|----------------------|-----------|--------------|---------------|----------------------|-----------|
| | Originator | | Sponsor ¹ | | Originator | | Sponsor ¹ | |
| | Traditional | Synthetic | Traditional | Synthetic | Traditional | Synthetic | Traditional | Synthetic |
| Residential mortgages | 3,277 | 0 | 3,828 | 0 | 2,457 | 0 | 2,359 | 0 |
| Commercial mortgages | 3,213 | 0 | 5,230 | 0 | 4,081 | 0 | 5,616 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leasing | 97 | 0 | 0 | 0 | 121 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ² | 870 | 34,285 | 1,270 | 0 | 33 | 35,900 | 1,741 | 0 |
| Consumer loans | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other assets | 0 | 2,331 | 0 | 0 | 0 | 2,193 | 0 | 0 |
| Total outstanding exposures securitized³ | 7,457 | 36,616 | 10,327 | 0 | 6,692 | 38,093 | 9,717 | 0 |

¹ As of December 31, 2018 included under sponsor is the amount € 5.0 billion of multi-seller related securitized exposures, of which we have originated € 2.5 billion, and therefore have also included this amount under originator. For December 31, 2017 the amounts were € 5.2 billion and € 2.4 billion respectively.

² SMEs are small- or medium-sized enterprises.

³ For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table "Banking book securitization positions retained or purchased by risk weight band".

The table below provides the total outstanding exposure securitized in relation to securitization positions held in our regulatory trading book separately for originator and sponsor activities and further broken down into traditional and synthetic transactions. Short synthetic single tranche CDOs have been wind down in 2018. The total outstanding exposure securitized as shown in the table below does not reflect our risk as it includes exposures not retained by us, does not consider the different positioning in the waterfall of related positions and – most notably – does not reflect hedging.

The € 1.9 billion increase in outstanding exposure of originator traditional transactions is due to the extended securitization activities during the reporting year. Of € 57.0 billion multi-seller related securitized exposures noted under sponsor, we have originated € 22.2 billion. This amount is also included under originator.

Outstanding exposures securitized by exposure type (overall pool size) within the trading book

| in € m. | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|--|---------------|-----------|----------------------|-----------|---------------|-----------|----------------------|-----------|
| | Originator | | Sponsor ¹ | | Originator | | Sponsor ¹ | |
| | Traditional | Synthetic | Traditional | Synthetic | Traditional | Synthetic | Traditional | Synthetic |
| Residential mortgages | 3,320 | 0 | 4,651 | 0 | 3,798 | 0 | 4,296 | 0 |
| Commercial mortgages | 38,196 | 0 | 56,944 | 0 | 34,680 | 0 | 49,338 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ² | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 |
| Consumer loans | 0 | 0 | 0 | 0 | 1,102 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other assets | 748 | 0 | 0 | 0 | 727 | 0 | 0 | 0 |
| Total outstanding exposures securitized³ | 42,263 | 0 | 61,595 | 0 | 40,307 | 29 | 53,634 | 0 |

¹ As of December 31, 2018 included under sponsor is the amount € 57.0 billion of multi-seller related securitized exposures, of which we have originated € 22.2 billion, and therefore have also included this amount under originator. For December 31, 2017 the amounts were € 49.3 billion and € 20.2 billion respectively.

² SMEs are small- or medium-sized enterprises.

³ For a regulatory assessment of our exposure to market risk in relation to securitization activity in the trading book see table "Trading book securitization positions retained or purchased by risk weight band subject to the MRSA". Additionally the table includes securitized exposure as originator amounting to € 1.8 billion and as sponsor amounting to € 3.4 billion already reflected in table "Outstanding exposures securitized by exposure type (overall pool size) within the banking book".

(ii) - On balance sheet securitization retained or purchased, and off-balance sheet exposures

The table below shows the amount of the securitization positions retained or purchased in the banking and trading book. The reported amounts in the banking book are based on the regulatory exposure values after financial collateral usage and hedging but prior to the application of other credit risk mitigation techniques. The securitization positions in the regulatory trading book are reported based on the exposure definition in Articles 327 to 332 CRR which states that identical or closely matched securities and derivatives shall be offset to a net position. The capital requirements for securitization positions within the regulatory banking and trading book are additionally reported by the underlying exposure type.

Securitization positions retained or purchased by exposure type

| in € m. | Banking Book | | | | | Trading Book | | | | |
|---|-------------------------------------|--|---------------------------|---------------------------------------|----------------------|-------------------------------------|--|---------------------------|----------------------------------|----------------------|
| | On-balance securitization positions | Off-balance, derivative and SFT securitization positions | Regulatory exposure value | of which $\geq 1,250\%$ risk weighted | Capital requirements | On-balance securitization positions | Off-balance, derivative and SFT securitization positions | Regulatory exposure value | of which $1,250\%$ risk weighted | Capital requirements |
| | | | | | | | | | | |
| Residential mortgages | 3,641 | 10 | 3,651 | 105 | 177 | 1,358 | 188 | 1,546 | 134 | 48 |
| Commercial mortgages | 864 | 359 | 1,223 | 12 | 34 | 505 | 870 | 1,375 | 21 | 23 |
| Credit card receivables | 475 | 437 | 912 | 0 | 18 | 19 | 0 | 19 | 0 | 0 |
| Leasing | 2,444 | 393 | 2,837 | 9 | 50 | 23 | 0 | 23 | 0 | 1 |
| Loans to corporates or SMEs (treated as corporates) ¹ | 46,391 | 2,599 | 48,990 | 14 | 338 | 1,384 | 0 | 1,384 | 175 | 244 |
| Consumer loans | 5,101 | 2,334 | 7,434 | 4 | 78 | 396 | 13 | 409 | 23 | 39 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other assets | 4,654 | 60 | 4,714 | 57 | 45 | 483 | 0 | 483 | 38 | 61 |
| Total securitization positions retained or purchased² | 63,570 | 6,191 | 69,762 | 200 | 740 | 4,168 | 1,070 | 5,238 | 391 | 415 |

¹ SMEs are small- or medium-sized enterprises.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activities see table "Banking book securitization positions retained or purchased by risk weight band" and for our exposure to market risk in relation to securitization activities see table "Trading book securitization positions retained or purchased by risk weight band subject to MRSA".

| in € m. | Banking Book | | | | | Trading Book | | | | |
|---|-------------------------------------|--|---------------------------|---------------------------------------|----------------------|-------------------------------------|--|---------------------------|----------------------------------|----------------------|
| | On-balance securitization positions | Off-balance, derivative and SFT securitization positions | Regulatory exposure value | of which $\geq 1,250\%$ risk weighted | Capital requirements | On-balance securitization positions | Off-balance, derivative and SFT securitization positions | Regulatory exposure value | of which $1,250\%$ risk weighted | Capital requirements |
| | | | | | | | | | | |
| Residential mortgages | 2,914 | 82 | 2,996 | 89 | 113 | 1,613 | 42 | 1,655 | 71 | 97 |
| Commercial mortgages | 737 | 421 | 1,159 | 15 | 45 | 669 | 1,933 | 2,603 | 10 | 43 |
| Credit card receivables | 398 | 416 | 814 | 0 | 21 | 39 | 0 | 39 | 0 | 1 |
| Leasing | 3,055 | 606 | 3,661 | 6 | 38 | 57 | 0 | 57 | 0 | 2 |
| Loans to corporates or SMEs (treated as corporates) ¹ | 45,428 | 1,241 | 46,670 | 24 | 512 | 1,216 | 17 | 1,233 | 166 | 207 |
| Consumer loans | 5,374 | 452 | 5,826 | 2 | 60 | 270 | 0 | 270 | 1 | 8 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 35 | 0 | 5 |
| Covered bonds | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other assets | 1,620 | 56 | 1,676 | 7 | 25 | 311 | 1 | 312 | 4 | 14 |
| Total securitization positions retained or purchased² | 59,526 | 3,275 | 62,802 | 143 | 814 | 4,215 | 1,993 | 6,209 | 253 | 377 |

¹ SMEs are small- or medium-sized enterprises.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activities see table "Banking book securitization positions retained or purchased by risk weight band" and for our exposure to market risk in relation to securitization activities see table "Trading book securitization positions retained or purchased by risk weight band subject to MRSA".

Total retained or purchased securitization positions in the banking book increased by € 7.0 billion or 11 % throughout the year 2018. The increase was mainly driven by investments in the exposure class "Other assets". Rise in the exposure class "Loans to corporates or SMEs (treated as corporates)" both by investor as well as originator activities of synthetic securitization supported the overall development.

Despite an increase in the regulatory exposure value capital requirements decreased by 9 % to € 740 million as risk positions were shifted to more senior positions with lower risk weights.

Within the trading book, the securitization exposure decreased by € 971 million or 16 % mainly in the exposure type “Commercial mortgages” due to reduced book volume. Despite the overall exposure decrease, the capital requirement increased by € 38 million in 2018 due to higher capital requirement for “Other assets” and “Consumer loans”.

Securitization positions retained or purchased by region (exposure amount)

| in € m. | Dec 31, 2018 | | Dec 31, 2017 | |
|---|---------------|--------------|---------------|--------------|
| | Banking Book | Trading Book | Banking Book | Trading Book |
| Europe | 13,387 | 1,771 | 21,464 | 1,048 |
| Americas | 54,022 | 2,506 | 35,924 | 3,411 |
| Asia/Pacific | 888 | 848 | 5,411 | 1,049 |
| Other | 1,465 | 113 | 3 | 701 |
| Total securitization positions retained or purchased¹ | 69,762 | 5,238 | 62,802 | 6,209 |

¹ For a regulatory assessment of our exposure to credit risk in relation to securitization activities see table “Banking book securitization positions retained or purchased by risk weight band” and for our exposure to market risk in relation to securitization activities see table “Trading book securitization positions retained or purchased by risk weight band subject to MRSA”.

The amounts shown in the table above are based on the country of domicile of the obligors of the exposures securitized. The exposure increase in the banking book for the region “Americas” was a result of higher business volume. Disposed securitization positions led to the decrease in “Europe”. In “Other” those securitization positions are included where the pool of securitization consists of different countries and no country exceeds the 20 % threshold. The exposure reduction in the trading book within the regions “Europe” and “Americas” was driven by the aforementioned regulatory exposure decline in the exposure class “Consumer Loans”.

(iii) - Amount of assets awaiting securitization

The following table provides details of existing banking and trading book outstanding exposures split by exposure type for which there is a management intention to securitize them in either an existing or new securitization transaction in the near future. Outstanding exposures awaiting securitization do not include assets due for securitization without risk transfer, e.g. those securitizations where we will keep all tranches.

Outstanding exposures awaiting securitization (exposure amount)

| in € m. | Dec 31, 2018 | | Dec 31, 2017 | |
|--|--------------|--------------|--------------|--------------|
| | Banking Book | Trading Book | Banking Book | Trading Book |
| Residential mortgages | 0 | 0 | 0 | 0 |
| Commercial mortgages | 0 | 902 | 0 | 1,551 |
| Credit card receivables | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ¹ | 3,933 | 0 | 2,498 | 0 |
| Consumer loans | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 |
| Other assets | 0 | 0 | 0 | 0 |
| Outstanding exposures awaiting securitization | 3,933 | 902 | 2,498 | 1,551 |

¹ SMEs are small- or medium-sized enterprises.

As of December 31, 2018 we held “Commercial mortgages” in the amount of € 0.9 billion in the trading book and “Loans to corporates or SMEs (treated as corporates)” of € 3.9 billion in the banking book with the intention to securitize them.

(iv) - Early amortization treatment

There is no securitization position for which we have applied the special provisions for originators of securitization transactions which include an investor’s interest to be recognized by the originator pursuant to Article 256 CRR respectively Article 265 CRR.

(v) - Deducted or 1,250 %-weighted securitization positions

Please refer for deducted or 1,250 % weighted securitization positions to the section “Article 449 (n)(ii) - On balance sheet securitization retained or purchased, and off-balance sheet exposures” within this Pillar 3 report on pages 162.

(vi) - Amount of exposures securitized and recognized gains or losses on sales

The 2018 year-end amounts in the tables below show an increase of our securitization activity in the banking book compared with 2017. This increased activity predominately concerned the exposure type "Loans to corporates or SMEs (treated as corporates)" dominated by the synthetic transactions executed by the Corporate & Investment Bank. The higher exposure originated via synthetic securitizations in 2018 compared to 2017 in the banking book was mainly driven by a new synthetic securitization position with derivative exposures securitized.

Securitization activity – Total outstanding exposures securitized (i.e., the underlying pools) by exposure type within the banking book

| in € m. | Dec 31, 2018 | | Originator 2018 | Sponsor Dec 31, 2018 | |
|--|--------------|---------------|--|-------------------------|-----------|
| | Traditional | Synthetic | Realized gains (losses) from sales/ liquidations | Traditional | Synthetic |
| Residential mortgages | 147 | 0 | 1 | 2,465 | 0 |
| Commercial mortgages | 0 | 0 | 0 | 473 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ¹ | 0 | 13,935 | 0 | 483 | 0 |
| Consumer loans | 0 | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 |
| Covered Bonds | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 |
| Other assets | 0 | 0 | 0 | 0 | 0 |
| Total Outstanding Exposures Securitized² | 147 | 13,935 | 1 | 3,421 | 0 |

¹ SMEs are small- or medium-sized enterprises.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table "Banking book securitization positions retained or purchased by risk weight band".

| in € m. | Dec 31, 2017 | | Originator 2017 | Sponsor Dec 31, 2017 | |
|--|--------------|---------------|--|-------------------------|-----------|
| | Traditional | Synthetic | Realized gains (losses) from sales/ liquidations | Traditional | Synthetic |
| Residential mortgages | 0 | 0 | 0 | 362 | 0 |
| Commercial mortgages | 310 | 0 | 0 | 0 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ¹ | 0 | 7,970 | 0 | 450 | 0 |
| Consumer loans | 0 | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 |
| Covered Bonds | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 |
| Other assets | 0 | 2,193 | 0 | 0 | 0 |
| Total Outstanding Exposures Securitized² | 310 | 10,163 | 0 | 812 | 0 |

¹ SMEs are small- or medium-sized enterprises.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table "Banking book securitization positions retained or purchased by risk weight band".

The table below shows our securitization activities in the trading book which increased by 6 % to € 9.9 billion driven by improved business opportunities in the US CMBS market. The origination activity was also driving the movement in sponsored exposure as we deem ourselves originator and additionally sponsor in case of multi-seller securitizations.

Securitization activity – Total outstanding exposures securitized by exposure type within the trading book

| in € m. | Originator | | Realized gains (losses) from sales/ liquidations | Sponsor ¹ | |
|--|--------------|-----------|--|----------------------|-----------|
| | Dec 31, 2018 | 2018 | | Dec 31, 2018 | |
| | Traditional | Synthetic | | Traditional | Synthetic |
| Residential mortgages | 2,268 | 0 | 0 | 784 | 0 |
| Commercial mortgages | 7,595 | 0 | 51 | 19,290 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ² | 0 | 0 | 0 | 0 | 0 |
| Consumer loans | 0 | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 |
| Covered Bonds | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 |
| Other assets | 0 | 0 | 0 | 0 | 0 |
| Total Outstanding Exposures Securitized³ | 9,863 | 0 | 51 | 20,074 | 0 |

¹ Included under sponsor is the amount € 19.3 billion exposures securitized, of which we originated € 7.0 billion, also included under originator.

² SMEs are small- or medium-sized enterprises.

³ For a regulatory assessment of our exposure to market risk in relation to securitization activity in the trading book see table "Trading book securitization positions retained or purchased by risk weight band subject to the MRSA".

| in € m. | Originator | | Realized gains (losses) from sales/ liquidations | Sponsor | |
|--|--------------|-----------|--|--------------|-----------|
| | Dec 31, 2017 | 2017 | | Dec 31, 2017 | |
| | Traditional | Synthetic | | Traditional | Synthetic |
| Residential mortgages | 3,005 | 0 | 12 | 0 | 0 |
| Commercial mortgages | 5,170 | 0 | 27 | 6,990 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ² | 0 | 0 | 0 | 0 | 0 |
| Consumer loans | 1,102 | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 | 0 |
| Covered Bonds | 0 | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 | 0 |
| Other assets | 0 | 0 | 0 | 0 | 0 |
| Total Outstanding Exposures Securitized³ | 9,277 | 0 | 39 | 6,990 | 0 |

¹ Included under sponsor is the amount € 6.9 billion exposures securitized, of which we originated € 2.8 billion, also included under originator.

² SMEs are small- or medium-sized enterprises.

³ For a regulatory assessment of our exposure to market risk in relation to securitization activity in the trading book see table "Trading book securitization positions retained or purchased by risk weight band subject to the MRSA".

Article 449 (o)(i) CRR - Retained or purchased banking and trading book securitizations broken down by risk-weight bands

Banking book securitization exposure

The following table presents the retained or purchased banking book securitizations by their regulatory calculation approach and further broken down by risk-weight bands.

Banking book securitization positions retained or purchased by risk weight band

| in € m. | Dec 31, 2018 | | | Jun 30, 2018 | | |
|---|-----------------|--|--|-----------------|--|--|
| | Exposure amount | Capital requirements IRBA ¹ | Capital requirements standardized approach | Exposure amount | Capital requirements IRBA ¹ | Capital requirements standardized approach |
| ≤ 10 % | 63,779 | 377 | 0 | 56,645 | 336 | 0 |
| > 10 ≤ 20 % | 2,475 | 12 | 20 | 2,489 | 16 | 15 |
| > 20 ≤ 50 % | 1,909 | 40 | 5 | 1,558 | 26 | 19 |
| > 50 ≤ 100 % | 1,226 | 33 | 42 | 761 | 33 | 15 |
| > 100 ≤ 350 % | 46 | 5 | 1 | 44 | 6 | 1 |
| > 350 ≤ 650 % | 64 | 28 | 0 | 4 | 2 | 0 |
| > 650 < 1,250 % | 63 | 35 | 29 | 42 | 27 | 0 |
| ≥ 1,250% ≤ 1,325 % | 200 | 112 | 0 | 150 | 91 | 15 |
| Total securitization positions retained or purchased | 69,762 | 643 | 97 | 61,693 | 537 | 66 |

¹ After considering value adjustments according to Article 266 (1,2) CRR. Including capital requirements for maturity mismatch of synthetic securitizations by risk weight band defined as notional weighted average risk weight of the underlying pool.

Following an exposure increase of 13 % or € 8.1 billion, the capital requirements for securitization positions in the banking book increased by 23 % to € 0.7 billion. This was primarily driven by investor activities in senior tranches subject to the Credit Risk Standardized Approach ("CRSA").

The largest portion (95 %) of IRBA eligible banking book securitization exposures were treated according to the Supervisory Formula Approach ("SFA"). For the remaining IRBA eligible banking book exposures (5 %) we used the Ratings Based Approach ("RBA").

Banking book securitization positions retained or purchased by risk weight bands subject to the IRBA-Rating based approach (RBA)

| in € m. | Dec 31, 2018 | | | | | | Dec 31, 2017 | | | | |
|---|---------------------|-----------------------|--|---|-----------------------|--|---------------------|-----------------------|--|---|-----------------------|
| | Exposure amount | | | Capital requirements, IRBA-RBA ¹ | | | Exposure amount | | | Capital requirements, IRBA-RBA ¹ | |
| | Securiti- zation | Re- Securitization | | Securiti- zation | Re- Securitization | | Securiti- zation | Re- Securitization | | Securiti- zation | Re- Securitization |
| ≤ 10 % | 915 | 0 | | 6 | 0 | | 1,347 | 0 | | 12 | 0 |
| > 10 ≤ 20 % | 935 | 0 | | 10 | 0 | | 965 | 0 | | 10 | 0 |
| > 20 ≤ 50 % | 944 | 0 | | 22 | 0 | | 478 | 12 | | 10 | 0 |
| > 50 ≤ 100 % | 471 | 0 | | 30 | 0 | | 495 | 16 | | 31 | 1 |
| > 100 ≤ 350 % | 7 | 0 | | 1 | 0 | | 10 | 0 | | 1 | 0 |
| > 350 ≤ 650 % | 3 | 0 | | 1 | 0 | | 7 | 0 | | 2 | 0 |
| > 650 < 1,250 % | 0 | 0 | | 0 | 0 | | 2 | 0 | | 2 | 0 |
| ≥ 1,250% ≤ 1,325 % | 126 | 6 | | 83 | 7 | | 110 | 9 | | 65 | 9 |
| Total securitization positions retained or purchased | 3,403 | 6 | | 152 | 7 | | 3,414 | 37 | | 133 | 11 |

¹ After considering value adjustments according to Article 266 (1,2) CRR.

Exposures subject to the securitization IRBA-RBA stayed almost constant compared to December 31, 2017. Due to value adjustments applied to securitization positions the capital requirement in the risk bucket $\geq 1,250\% \leq 1,325\%$ was significantly lower than the exposure amount. Our re-securitization exposure reduced by € 31 million, predominantly due to disposals of re-securitization positions.

Banking book securitization positions retained or purchased by risk weight band subject to the IRBA-Supervisory formula approach (SFA)

| in € m. | Dec 31, 2018 | | | | | | Dec 31, 2017 | | | | |
|---|---------------------|-----------------------|--|---|-----------------------|--|---------------------|-----------------------|--|---|-----------------------|
| | Exposure amount | | | Capital requirements, IRBA-SFA ¹ | | | Exposure amount | | | Capital requirements, IRBA-SFA ¹ | |
| | Securiti- zation | Re- Securitization | | Securiti- zation | Re- Securitization | | Securiti- zation | Re- Securitization | | Securiti- zation | Re- Securitization |
| ≤ 10 % | 62,864 | 0 | | 372 | 0 | | 56,485 | 0 | | 485 | 0 |
| > 10 ≤ 20 % | 307 | 0 | | 3 | 0 | | 359 | 0 | | 4 | 0 |
| > 20 ≤ 50 % | 838 | 0 | | 17 | 0 | | 425 | 0 | | 13 | 0 |
| > 50 ≤ 100 % | 84 | 0 | | 3 | 0 | | 68 | 0 | | 3 | 0 |
| > 100 ≤ 350 % | 28 | 0 | | 5 | 0 | | 121 | 0 | | 16 | 0 |
| > 350 ≤ 650 % | 62 | 0 | | 27 | 0 | | 0 | 0 | | 0 | 0 |
| > 650 < 1,250 % | 62 | 0 | | 35 | 0 | | 89 | 0 | | 64 | 0 |
| 1,250 % | 23 | 0 | | 23 | 0 | | 8 | 0 | | 8 | 0 |
| Total securitization positions retained or purchased | 64,268 | 0 | | 485 | 0 | | 57,556 | 0 | | 593 | 0 |

¹ After considering value adjustments according to Article 266 (1,2) CRR.

² Including capital requirements for maturity mismatch of synthetic securitizations by risk weight band defined as notional weighted average risk weight of the underlying pool.

Banking Book exposure subject to the IRBA-Supervisory Formula Approach overall increased by € 6.7 billion or 12 % to € 64.3 billion in 2018, mainly driven by higher investor activity in senior tranches.

The Credit Risk Standardized Approach ("CRSA") is used for securitization positions where the underlying portfolio predominantly consists of credit risk exposures, which would qualify for application of the CRSA if these exposures would be directly held by us.

Banking book securitization positions retained or purchased by risk weight band subject to the credit risk standardized approach (CRSA)

| in € m. | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|---|---------------------|-----------------------|--------------------------|-----------------------|---------------------|-----------------------|--------------------------|-----------------------|
| | Exposure amount | | Capital requirements, SA | | Exposure amount | | Capital requirements, SA | |
| | Securiti- zation | Re- Securitization | Securiti- zation | Re- Securitization | Securiti- zation | Re- Securitization | Securiti- zation | Re- Securitization |
| ≤ 10 % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| > 10 ≤ 20 % | 1,232 | 0 | 20 | 0 | 896 | 0 | 14 | 0 |
| > 20 ≤ 50 % | 127 | 0 | 5 | 0 | 394 | 0 | 16 | 0 |
| > 50 ≤ 100 % | 672 | 0 | 42 | 0 | 479 | 0 | 31 | 0 |
| > 100 ≤ 350 % | 10 | 0 | 1 | 0 | 9 | 0 | 1 | 0 |
| > 350 ≤ 650 % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| > 650 < 1,250 % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1,250 % | 44 | 0 | 29 | 0 | 16 | 0 | 16 | 0 |
| Total securitization positions retained or purchased | 2,085 | 0 | 97 | 0 | 1,794 | 0 | 77 | 0 |

Exposure subject to CRSA increased by € 291 million following generally higher business activity in the last quarter of 2018.

Trading book securitization exposure

The following table presents the retained or purchased trading book securitizations by their regulatory calculation approach and further broken down by risk-weight bands.

For trading book securitization positions the capital requirement for specific market risk is calculated based on the MRSA. The MRSA risk weight calculation for trading book securitization positions is generally based on the same methodologies which apply to banking book securitization positions. More details on the approaches are provided in section “Article 449 (h) CRR - RWA calculation approaches for securitization positions” on the page 158 in our annual Pillar 3 Report 2018.

Trading book securitization positions retained or purchased by risk weight band subject to the market risk standardized approach (MRSA)

| in € m. | Dec 31, 2018 | | | | Jun 30, 2018 | | | |
|---|---------------------|-----------------------|----------------------------|-----------------------|---------------------|-----------------------|----------------------------|-----------------------|
| | Exposure amount | | Capital requirements, MRSA | | Exposure amount | | Capital requirements, MRSA | |
| | Securiti- zation | Re- Securitization | Securiti- zation | Re- Securitization | Securiti- zation | Re- Securitization | Securiti- zation | Re- Securitization |
| ≤ 10 % | 1,126 | 0 | 7 | 0 | 909 | 0 | 5 | 0 |
| > 10 ≤ 20 % | 2,776 | 0 | 27 | 0 | 2,919 | 0 | 30 | 0 |
| > 20 ≤ 50 % | 237 | 1 | 9 | 0 | 372 | 53 | 12 | 2 |
| > 50 ≤ 100 % | 425 | 0 | 30 | 0 | 348 | 4 | 25 | 0 |
| > 100 ≤ 350 % | 60 | 0 | 16 | 0 | 22 | 0 | 5 | 0 |
| > 350 ≤ 650 % | 220 | 2 | 58 | 1 | 120 | 33 | 36 | 17 |
| > 650 < 1,250 % | 0 | 0 | 0 | 0 | 5 | 0 | 3 | 0 |
| 1,250 % | 389 | 2 | 266 | 2 | 210 | 4 | 184 | 4 |
| Total securitization positions retained or purchased | 5,233 | 5 | 412 | 3 | 4,905 | 95 | 302 | 23 |

Compared to June 2018, the exposure of trading book securitization and re-securitization positions increased by € 328 million or 7 % to € 5.2 billion mainly due to higher trading activity and the decommission of the internal model comprehensive risk measure (CRM) in the fourth quarter of 2018. With this model change remaining securitization positions treated previously within the CRM are now subject to the Market Risk Standardized Approach (MRSA). In comparison to last quarter the re-securitization positions were reduced by € 90 million. For 7 % of the securitization positions the own funds requirement cap of Article 335 CRR is applied, which results in a capital requirement saving of € 123 million, which is realized in the risk weight buckets 1,250 %.

Article 449 (o)(ii) CRR - Retained or purchased re-securitization exposures for banking and trading book

In 2018 we further reduced our exposure in re-securitization positions.

Trading book re-securitization exposure was reduced by 94 % mainly as a result of maturing positions. Banking book re-securitization exposure declined by 84 %, due to disposals and principal payments.

Re-securitization positions retained or purchased (exposure amount)

| in € m. | Dec 31, 2018 | | | | Dec 31, 2017 | | | |
|-----------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|
| | Banking Book | | Trading Book | | Banking Book | | Trading Book | |
| | Before hedging/insurances | After hedging/insurances | Before hedging/insurances | After hedging/insurances | Before hedging/insurances | After hedging/insurances | Before hedging/insurances | After hedging/insurances |
| Re-Securitization Positions | 6 | 6 | 5 | 5 | 37 | 37 | 84 | 71 |

Risk mitigation in the form of financial guarantees has not been applied to our re-securitization positions in neither the banking nor the trading book.

Article 449 (p) CRR - Impaired assets and recognized losses related to banking book securitizations

The Group has aligned its definition of “credit impaired” under IFRS 9 to the default definition as per Art. 178 of the Capital Requirements Regulation (CRR) for regulatory purposes. As a consequence, Stage 3 Financial Assets consist of two types of defaulted financial assets: firstly financial assets, where the Group expects an impairment loss reflected in an allowance for credit losses and secondly financial assets, where the group does not expect an impairment loss (e.g., due to high quality collateral or sufficient expected future cash flows following thorough due diligence). This is a major difference to our impairment definition under IAS 39, where Financial Assets were only considered to be impaired if the Group expected to suffer an impairment loss.

The following table provides details of the quality of the underlying asset pool of outstanding exposures securitized for which we are an originator and hold positions in the regulatory banking book. An exposure is reported as past due when it has the status past due for 30 days or more and has not already been included as impaired. For our originated synthetic securitizations, impaired and past due exposure amounts are determined through our internal administration, while for our originated traditional securitizations, impaired and past due exposure amounts are primarily derived from investor reports of underlying exposures.

Separately, the table details losses we recognized in 2018 and 2017 for retained or purchased securitization positions as originator by exposure type. The losses are those reported in the consolidated statement of income. The amounts are the actual losses in the underlying asset pool to the extent that these losses are allocated to the retained or purchased securitization positions held by us after considering any eligible credit protection. This applies to both traditional and synthetic transactions.

Impaired and past due exposures securitized and losses recognized by exposure type (overall pool size) as originator

| in € m. | Dec 31, 2018 | 2018 | Dec 31, 2017 | 2017 |
|--|------------------------------------|----------|------------------------------------|----------|
| | Impaired/ past due ¹ | Losses | Impaired/ past due ¹ | Losses |
| Residential mortgages | 0 | 0 | 0 | 0 |
| Commercial mortgages | 0 | 2 | 0 | 0 |
| Credit card receivables | 0 | 0 | 0 | 0 |
| Leasing | 0 | 0 | 0 | 0 |
| Loans to corporates or SMEs (treated as corporates) ² | 14 | 0 | 33 | 2 |
| Consumer loans | 0 | 0 | 0 | 0 |
| Trade receivables | 0 | 0 | 0 | 0 |
| Covered bonds | 0 | 0 | 0 | 0 |
| Other liabilities | 0 | 0 | 0 | 0 |
| Other assets | 0 | 0 | 0 | 0 |
| Total impaired and past due exposures securitized and losses recognized³ | 14 | 2 | 33 | 2 |

¹ Includes the impaired and past due exposures in relation to the overall pool of multi-seller securitizations which could reflect more than our own originated portion.

² SMEs are small- or medium-sized entities.

³ For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table “Banking Book Securitization Positions Retained or Purchased by Risk Weight Band”.

The total impaired or past due exposure securitized decreased by 58 % to € 14 million in 2018 compared to € 33 million in 2017. The reduction is attributed to the exposure types “Loans to corporates or SMEs (treated as corporates)”. Losses recorded by us in 2018 remained stable with € 2 million compared to 2017.

Article 449 (q) CRR - Trading book securitization positions

Please refer for details about the trading book exposures to the section “Article 449 (n) CRR - Banking and trading book securitization exposures” in this Pillar 3 report on page 161.

Article 449 (r) CRR - Financial support to securitization vehicles

We have not provided any implicit support to our securitization vehicles.

Remuneration policy (Article 450 CRR)

For details please refer to the section “Compensation Report” in our Annual Report 2018 on the pages 154 - 203.

Leverage (Article 451 CRR)

We manage our balance sheet on a Group level and, where applicable, locally in each region. In the allocation of financial resources we favor business portfolios with the highest positive impact on our profitability and shareholder value. We monitor and analyze balance sheet developments and track certain market-observed balance sheet ratios. Based on this we trigger discussion and management action by the Group Risk Committee (GRC). Following the publication of the CRR/CRD 4 framework, we established a leverage ratio calculation according to that framework.

Leverage Ratio according to revised CRR/CRD 4 framework

The CRR/CRD 4 framework introduced a non-risk based leverage ratio that is intended to act as a supplementary measure to the risk based capital requirements. Its objectives are to constrain the build-up of leverage in the banking sector, helping avoid destabilizing deleveraging processes which can damage the broader financial system and the economy, and to reinforce the risk based requirements with a simple, non-risk based “backstop” measure. While the CRR/CRD 4 framework currently does not provide for a mandatory minimum leverage ratio to be complied with, the legislative proposals as part of the European Trilogue include a 3 % minimum requirement but the proposed implementation dates are different. The final Basel rules that have been published in December 2017 also include an additional leverage ratio buffer requirement for banks identified as global systemically important institution (“G-SII”) of 50 % of the G-SII buffer. Details of the implementation and the timing of the application of this additional leverage ratio buffer remain subject to finalization of the legislative process.

We calculate our leverage ratio exposure on a fully loaded basis in accordance with Article 429 of the CRR as per Delegated Regulation (EU) 2015/62 of October 10, 2014 published in the Official Journal of the European Union on January 17, 2015 amending Regulation (EU) No 575/2013. In addition, we provide the leverage ratio on a phase-in basis as displayed below in the tables.

Our total leverage ratio exposure includes derivatives, securities financing transactions (SFTs), off-balance sheet exposure and other on-balance sheet exposure (excluding derivatives and SFTs).

The leverage exposure for derivatives is calculated by using the regulatory mark-to-market method for derivatives comprising the current replacement cost plus a regulatory defined add-on for the potential future exposure. Variation margin received in cash from counterparties is deducted from the current replacement cost portion of the leverage ratio exposure measure and variation margin paid to counterparties is deducted from the leverage ratio exposure measure related to receivables recognized as an asset on the balance sheet, provided certain conditions are met. Deductions of receivables for cash variation margin provided in derivatives transactions are shown under derivative exposure in the table “Leverage ratio common disclosure” below. The effective notional amount of written credit derivatives, i.e., the notional reduced by any negative fair value changes that have been incorporated in Tier 1 capital is included in the leverage ratio exposure measure; the resulting exposure measure is further reduced by the effective notional amount of purchased credit derivative protection on the same reference name provided certain conditions are met.

The securities financing transaction (SFT) component includes the gross receivables for SFTs, which are netted with SFT payables if specific conditions are met. In addition to the gross exposure a regulatory add-on for the counterparty credit risk is included.

The off-balance sheet exposure component follows the credit risk conversion factors (CCF) of the standardized approach for credit risk (0 %, 20 %, 50 %, or 100 %), which depend on the risk category subject to a floor of 10 %.

The other on-balance sheet exposure component (excluding derivatives and SFTs) reflects the accounting values of the assets (excluding derivatives and SFTs) as well as regulatory adjustments for asset amounts deducted in determining Tier 1 capital.

The following tables show the leverage ratio exposure and the leverage ratio, both on a fully loaded basis, in accordance with the disclosure tables of the implementing technical standards (ITS) which were adopted by the European Commission via Commission Implementing Regulation (EU) 2016/200 published in the Official Journal of the European Union on February 16, 2016. For additional information, they also contain the phase-in figures.

Summary reconciliation of accounting assets and leverage ratio exposures

in € bn.

(unless stated otherwise)

| | Dec 31, 2018 | Jun 30, 2018 |
|---|--------------|--------------|
| Total assets as per published financial statements | 1,348 | 1,421 |
| Adjustment for entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation | 0 | 1 |
| (Adjustment for fiduciary assets recognized on the balance sheet pursuant to the applicable accounting framework but excluded from the leverage ratio total exposure measure in accordance with Article 429(13) of Regulation (EU) No 575/2013) | N/M | N/M |
| Adjustments for derivative financial instruments | (140) | (164) |
| Adjustment for securities financing transactions (SFTs) | 14 | 17 |
| Adjustment for off-balance sheet items (i.e. conversion to credit equivalent amounts of off-balance sheet exposures) | 99 | 97 |
| (Adjustment for intragroup exposures excluded from the leverage ratio total exposure measure in accordance with Article 429(7) of Regulation (EU) No 575/2013) | N/M | N/M |
| (Adjustment for exposures excluded from the leverage ratio total exposure measure in accordance with Article 429(14) of Regulation (EU) No 575/2013) | N/M | N/M |
| Other adjustments | (49) | (49) |
| Leverage ratio total exposure measure (fully loaded) | 1,273 | 1,324 |
| Leverage ratio total exposure measure (phase-in) | 1,273 | 1,324 |

N/M – Not meaningful

Leverage ratio common disclosure

in € bn.

(unless stated otherwise)

| | Dec 31, 2018 | Jun 30, 2018 |
|---|--------------|--------------|
| On-balance sheet exposures (excluding derivatives and SFTs) | | |
| On-balance sheet items (excluding derivatives, SFTs and fiduciary assets, but including collateral) | 925 | 984 |
| (Asset amounts deducted in determining Tier 1 capital) | (13) | (14) |
| Total on-balance sheet exposures (excluding derivatives, SFTs and fiduciary assets) | 911 | 970 |
| Derivative exposures | | |
| Replacement cost associated with all derivatives transactions (i.e. net of eligible cash variation margin) | 36 | 37 |
| Add-on amounts for PFE associated with all derivatives transactions (mark-to-market method) | 141 | 152 |
| Exposure determined under Original Exposure Method | N/M | N/M |
| Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the applicable accounting framework | 0 | 0 |
| (Deductions of receivables assets for cash variation margin provided in derivatives transactions) | (25) | (27) |
| (Exempted CCP leg of client-cleared trade exposures) | (11) | (14) |
| Adjusted effective notional amount of written credit derivatives | 393 | 489 |
| (Adjusted effective notional offsets and add-on deductions for written credit derivatives) | (376) | (477) |
| Total derivatives exposures | 159 | 160 |
| SFT exposures | | |
| Gross SFT assets (with no recognition of netting), after adjusting for sales accounting transactions | 144 | 136 |
| (Netted amounts of cash payables and cash receivables of gross SFT assets) | (54) | (54) |
| Counterparty credit risk exposure for SFT assets | 11 | 15 |
| Derogation for SFTs: Counterparty credit risk exposure in accordance with Articles 429b(4) and 222 of Regulation (EU) No 575/2013 | N/M | N/M |
| Agent transaction exposures | 1 | 1 |
| (Exempted CCP leg of client-cleared SFT exposure) | 0 | 0 |
| Total securities financing transaction exposures | 103 | 97 |
| Other off-balance sheet exposures | | |
| Off-balance sheet exposures at gross notional amount | 280 | 276 |
| (Adjustments for conversion to credit equivalent amounts) | (180) | (179) |
| Other off-balance sheet exposures | 99 | 97 |
| Exempted exposures in accordance with Article 429 (7) and (14) of Regulation (EU) No 575/2013 (on and off balance sheet) | | |
| (Intragroup exposures (solo basis) exempted in accordance with Article 429(7) of Regulation (EU) No 575/2013 (on and off balance sheet)) | N/M | N/M |
| (Exposures exempted in accordance with Article 429 (14) of Regulation (EU) No 575/2013 (on and off balance sheet)) | N/M | N/M |
| Capital and total exposure measure | | |
| Tier 1 capital (fully loaded) | 52.1 | 52.5 |
| Leverage ratio total exposure measure (fully loaded) | 1,273 | 1,324 |
| Leverage ratio (fully loaded, in %) | 4.1 | 4.0 |
| Tier 1 capital (phase-in) | 55.1 | 55.5 |
| Leverage ratio total exposure measure (phase-in) | 1,273 | 1,324 |
| Leverage ratio (phase-in, in %) | 4.3 | 4.2 |

N/M – Not meaningful

Breakdown of on-balance sheet exposures (excluding derivatives and SFTs)

in € bn.

(unless stated otherwise)

| | Dec 31, 2018 | Jun 30, 2018 |
|---|--------------|--------------|
| Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures) | 925 | 984 |
| of which: | | |
| Trading book exposures | 196 | 215 |
| Banking book exposures | 728 | 769 |
| of which: | | |
| Covered bonds | 1 | 2 |
| Exposures treated as sovereigns | 245 | 262 |
| Exposures to regional governments, MDB, international organizations and PSE not treated as sovereigns | 1 | 1 |
| Institutions | 17 | 20 |
| Secured by mortgages of immovable properties | 187 | 187 |
| Retail exposures | 35 | 35 |
| Corporate | 168 | 158 |
| Exposures in default | 6 | 7 |
| Other exposures (e.g. equity, securitizations, and other non-credit obligation assets) | 68 | 96 |

Process used to manage the risk of excessive leverage

As described in the section “Risk management principles” and “Risk governance” on pages 50-51 of our Annual Report 2018, the Group Risk Committee (GRC) is mandated to oversee, control and monitor integrated planning our risk profile and capital capacity. The Group Asset and Liability Committee (ALCO) actively manages leverage exposure capacity within the Risk Appetite Framework via a limit setting process

- to allocate group leverage exposure capacity to businesses,
- to support business achievement of strategic performance plans,
- to provide a firm basis for achieving the target leverage ratio,
- to incentivize businesses to make appropriate decisions on their portfolios, with consideration to asset maturity and encumbrance amongst others, and
- to maintain risk discipline.

In the case of limit excess the respective business is charged. The limit excess charges are calculated in accordance with the Group-wide limit-setting framework for leverage.

For further details please also refer to the “Capital management” section contained in chapter “Risk and capital management” on page 60 of our Annual Report 2018.

Factors that had an impact on the leverage ratio in the second half of 2018

As of December 31, 2018, our fully loaded CRR/CRD 4 leverage ratio was 4.1 % compared to 4.0 % as of June 30, 2018, taking into account as of December 31, 2018 a fully loaded Tier 1 capital of € 52.1 billion over an applicable exposure measure of € 1,273 billion (€ 52.5 billion and € 1,324 billion as of June 30, 2018, respectively).

Our CRR/CRD 4 leverage ratio according to transitional provisions was 4.3 % as of December 31, 2018 (4.2 % as of June 30, 2018), calculated as Tier 1 capital according to transitional rules of € 55.1 billion over an applicable exposure measure of € 1,273 billion (€ 55.5 billion and € 1,324 billion as of June 30, 2018, respectively).

Over the second half 2018, our leverage ratio exposure decreased by € 51 billion to € 1,273 billion. This is primarily driven by the € 59 billion reduction in Other Assets which reflects the development on our balance sheet, in particular for pending settlements which decreased seasonally by € 30 billion, cash and central bank / interbank balances which decreased by € 21 billion and non-derivative trading assets which decreased by € 8 billion. Net loans increased by € 10 billion and SFTs increased by € 6 billion, reflecting an increase on the balance sheet in the SFT related items (securities purchased under resale agreements, securities borrowed and receivables from prime brokerage). Derivatives decreased by € 1 billion from lower additions for the potential future exposure, partly offset by higher exposures for written credit protection. Off-balance sheet exposures slightly increased by € 2 billion corresponding to higher notional amounts for irrevocable lending commitments.

The decrease of the leverage ratio exposure in the second half 2018 includes a positive foreign exchange impact of € 10 billion mainly due to the depreciation of the Euro against the U.S. dollar.

Our leverage ratio calculated as the ratio of total assets under IFRS to total equity under IFRS was 20 as of December 31, 2018 compared to 21 as of June 30, 2018.

For main drivers of the Tier 1 capital development please refer to section “Own funds” on page 23 in this report.

Unencumbered assets (Article 443 CRR)

On March 3, 2017 the EBA published the final guidelines on the disclosure of encumbered and unencumbered assets as mandated by Article 443 CRR.

In accordance to the guideline the data uses the median of the last four quarterly data points. Therefore, the sum of sub-components does not necessarily add up.

Encumbered assets primarily comprise those on- and off-balance sheet assets that are pledged as collateral against secured funding, collateral swaps, and other collateralized obligations. Additionally, in line with the EBA technical standards on regulatory asset encumbrance reporting, we consider assets pledged with settlement systems, including default funds and initial margins as encumbered, as well as other assets pledged which cannot be freely withdrawn such as mandatory minimum reserves at central banks. We also include derivative margin receivable assets as encumbered under these EBA guidelines.

This section refers to asset encumbrance in the group of institutions consolidated for banking regulatory purposes pursuant to the German Banking Act. There under not included are insurance companies or companies outside the finance sector. Assets pledged by our insurance subsidiaries are included in the Annual Report 2018 in Note 22 "Transfer of financial assets, assets pledged and received as collateral" on page 297 of the consolidated financial statements, and restricted assets held to satisfy obligations to insurance companies' policy holders are included within Note 39 "Information on subsidiaries" on page 347 of the consolidated financial statements.

Encumbered and unencumbered assets

| | | Dec 31, 2018 | | | | | | | |
|----------|--|-------------------|--------------------------------|------------|--------------------------------|---------------------|--------------------------------|------------|--------------------------------|
| | | 010 | 030 | 040 | 050 | 060 | 080 | 090 | 100 |
| | | Encumbered assets | | | | Unencumbered assets | | | |
| | | Carrying amount | | Fair value | | Carrying amount | | Fair value | |
| in € bn. | | | of which central bank eligible | | of which central bank eligible | | of which central bank eligible | | of which central bank eligible |
| 030 | Equity instruments | 52.4 | 0 | – | – | 15.2 | 0 | – | – |
| 040 | Debt securities | 57.8 | 39.8 | 57.8 | 39.8 | 80.1 | 56.4 | 80.1 | 56.4 |
| | of which: | | | | | | | | |
| 050 | Covered bonds | 1.8 | 1.6 | 1.8 | 1.6 | 0 | 0 | 0 | 0 |
| 060 | Asset-backed securities | 4.1 | 1.5 | 4.1 | 1.5 | 0 | 0 | 0 | 0 |
| 070 | Issued by general governments | 33.3 | 27.0 | 33.3 | 27.0 | 53.6 | 49.7 | 53.6 | 49.7 |
| 080 | Issued by financial corporations | 19.4 | 11.0 | 19.4 | 11.0 | 12.5 | 0 | 12.5 | 0 |
| 090 | Issued by non-financial corporations | 4.7 | 1.1 | 4.7 | 1.1 | 10.1 | 5.4 | 10.1 | 5.4 |
| 120 | Other assets | 127.2 | 35.1 | – | – | 1,064.7 | 201.2 | – | – |
| | of which: | | | | | | | | |
| 122 | Loans other than loans on demand | 75.5 | 24.07 | – | – | 347.7 | 0 | – | – |
| 123 | Securities purchased under resale agreements and securities borrowed | 0 | 0 | – | – | 80.1 | 0 | – | – |
| 124 | Cash margin receivables / prime brokerage receivables | 38.6 | 0 | – | – | 13.9 | 0 | – | – |
| 010 | Total | 239.5 | 74.8 | – | – | 1,161.7 | 257.5 | – | – |

| | | Jun 30, 2018 | | | | | | | |
|----------|--|--------------------------------|------|--------------------------------|------|--------------------------------|-------|--------------------------------|------|
| | | 010 | 030 | 040 | 050 | 060 | 080 | 090 | 100 |
| | | Encumbered assets | | | | Unencumbered assets | | | |
| | | Carrying amount | | Fair value | | Carrying amount | | Fair value | |
| | | of which central bank eligible | | of which central bank eligible | | of which central bank eligible | | of which central bank eligible | |
| in € bn. | | | | | | | | | |
| 030 | Equity instruments | 58.4 | 0 | – | – | 19.8 | 0 | – | – |
| 040 | Debt securities | 65.4 | 42.3 | 65.4 | 42.3 | 82.5 | 49.7 | 82.5 | 49.7 |
| | of which: | | | | | | | | |
| 050 | Covered bonds | 1.9 | 1.7 | 1.9 | 1.7 | 0 | 0 | 0 | 0 |
| 060 | Asset-backed securities | 4.2 | 1.8 | 4.2 | 1.8 | 0 | 0 | 0 | 0 |
| 070 | Issued by general governments | 33.4 | 28.1 | 33.4 | 28.1 | 55.5 | 46.1 | 55.5 | 46.1 |
| 080 | Issued by financial corporations | 19.8 | 11.2 | 19.8 | 11.2 | 14.8 | 0 | 14.8 | 0 |
| 090 | Issued by non-financial corporations | 8.7 | 1.5 | 8.7 | 1.5 | 7.7 | 3.2 | 7.6 | 3.2 |
| 120 | Other assets | 124.4 | 34.2 | – | – | 1,106.8 | 212.9 | – | – |
| | of which: | | | | | | | | |
| 122 | Loans other than loans on demand | 71.5 | 23.2 | – | – | 350.1 | 0 | – | – |
| 123 | Securities purchased under resale agreements and securities borrowed | 0 | 0 | – | – | 100.4 | 0 | – | – |
| 124 | Cash margin receivables / prime brokerage receivables | 40.4 | 0 | – | – | 16.7 | 0 | – | – |
| 010 | Total | 247.6 | 76.1 | – | – | 1,230.9 | 260.0 | – | – |

Collateral received

| | | Dec 31, 2018 | | | |
|----------|--|--|-------|---|------|
| | | 010 | 030 | 040 | 060 |
| | | Fair value of encumbered collateral received or own debt securities issued | | Fair value of collateral received or own debt securities issued available for encumbrance | |
| | | of which central bank eligible | | of which central bank eligible | |
| in € bn. | | | | | |
| 140 | Loans on demand | 0 | 0 | 0 | 0 |
| 150 | Equity instruments | 114.0 | 0 | 10.3 | 0 |
| 160 | Debt securities | 153.2 | 97.1 | 36.6 | 13.1 |
| | of which: | | | | |
| 170 | Covered bonds | 3.8 | 3.3 | 0.9 | 0 |
| 180 | Asset-backed securities | 10.8 | 4.2 | 2.5 | 0 |
| 190 | Issued by general governments | 90.1 | 65.1 | 21.6 | 11.8 |
| 200 | Issued by financial corporations | 49.1 | 27.2 | 12.6 | 0 |
| 210 | Issued by non-financial corporations | 12.2 | 2.8 | 2.9 | 1.3 |
| 220 | Loans and advances other than loans on demand | 0 | 0 | 0 | 0 |
| 230 | Other collateral received | 0.0 | 0 | 0.0 | 0 |
| 130 | Total collateral received | 265.9 | 97.1 | 49.0 | 13.1 |
| 240 | Own debt securities issued other than own covered bonds or asset-backed securities | 0 | 0 | 0 | 0 |
| 241 | Own covered bonds and asset-backed securities issued and not yet pledged | – | – | 2.6 | 0.3 |
| 250 | Total Assets, collateral received and own debt securities issued | 505.4 | 171.1 | – | – |

| in € bn. | Jun 30, 2018 | | | | |
|------------|--|--------------------------------|--|-------------|-------------|
| | 010 | 030 | 040 | 060 | |
| | 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 | | |
| | of which central bank eligible | of which central bank eligible | of which central bank eligible | | |
| 140 | Loans on demand | 0 | 0 | 0 | 0 |
| 150 | Equity instruments | 118.4 | 0 | 16.7 | 0 |
| 160 | Debt securities | 191.0 | 111.4 | 37.9 | 14.4 |
| | of which: | | | | |
| 170 | Covered bonds | 3.7 | 3.2 | 0.7 | 0 |
| 180 | Asset-backed securities | 12.3 | 5.0 | 2.4 | 0 |
| 190 | Issued by general governments | 95.0 | 75.3 | 20.6 | 12.7 |
| 200 | Issued by financial corporations | 53.6 | 29.1 | 11.8 | 0 |
| 210 | Issued by non-financial corporations | 26.4 | 4.4 | 4.7 | 1.9 |
| 220 | Loans and advances other than loans on demand | 0 | 0 | 0 | 0 |
| 230 | Other collateral received | 0.1 | 0 | 0.4 | 0 |
| 130 | Total collateral received | 309.6 | 111.4 | 53.8 | 14.4 |
| 240 | Own debt securities issued other than own covered bonds or asset-backed securities | 0 | 0 | 0 | 0 |
| 241 | Own covered bonds and asset-backed securities issued and not yet pledged | – | – | 8.5 | 0.2 |
| 250 | Total Assets, collateral received and own debt securities issued | 557.7 | 187.4 | – | – |

The above tables set out a breakdown of on- and off-balance sheet items, broken down between encumbered and unencumbered. Any securities borrowed or purchased under resale agreements are shown based on the fair value of collateral received.

For December 2018, € 239.5 billion of the Group's on-balance sheet assets were encumbered. These assets primarily related to firm financing of trading inventory and other securities, to funding (i.e., Pfandbriefe and covered bonds) secured against loan collateral and to cash collateral for derivative margin requirements.

For December 2018, the Group had received securities as collateral with a fair value of € 173.5 billion, of which € 157.9 billion were sold or on pledged. These pledges typically relate to trades to facilitate client activity, including prime brokerage, collateral posted in respect of Exchange Traded Funds and derivative margin requirements.

The above tables of encumbered assets include assets that are not encumbered at an individual entity level, but which may be subject to restrictions in terms of their transferability within the group. Such restrictions may be due to local connected lending requirements or similar regulatory restrictions.

'Own debt securities issued other than covered bonds and asset backed securities' refers to those own bond holdings that are not derecognized from the balance sheet by a non-IFRS institution. This is not applicable for Deutsche Bank Group.

Sources of encumbrance (formerly encumbered assets/collateral received and associated liabilities)

| in € bn. | Dec 31, 2018 | | Jun 30, 2018 | | |
|----------|---|---|---|---|-------|
| | 010 | 030 | 010 | 030 | |
| | Matching liabilities, contingent liabilities or securities lent | Assets, collateral received and own debt securities issued other than covered bonds and ABSs encumbered | Matching liabilities, contingent liabilities or securities lent | Assets, collateral received and own debt securities issued other than covered bonds and ABSs encumbered | |
| 010 | Carrying amount of selected financial liabilities | 157.9 | 173.5 | 162.5 | 177.3 |
| 011 | of which: | | | | |
| 012 | Derivatives | 47.4 | 49.0 | 47.1 | 49.4 |
| 013 | Repurchase agreements | 42.4 | 43.6 | 50.5 | 51.8 |
| 014 | Collateralized central bank deposits and covered bonds issued | 47.7 | 60.2 | 45.3 | 56.8 |

The above table shows selected amounts for encumbered on- and off-balance sheet assets against the corresponding liabilities that have given rise to the encumbrance. These include assets pledged for derivatives margin, collateral required for repurchase agreements, and assets needed for the Group's covered bond issuance portfolio and the ECB's Targeted Longer Term Refinancing Operation.

Liquidity

As part of the Basel 3 rules, the Basel Committee on Banking Supervision specified two minimum liquidity standards for banks:

The Liquidity Coverage Ratio (LCR):

The LCR is intended to promote the short-term resilience of a bank's liquidity risk profile over a 30 day stress scenario. The ratio is defined as the amount of High Quality Liquid Assets ("HQLA") that could be used to raise liquidity, measured against the total volume of net cash outflows, arising from both contractual and modelled exposures, in a stressed scenario.

This requirement has been implemented into European law, via the Commission Delegated Regulation (EU) 2015/61, adopted in October 2014. Compliance with the LCR was required in the EU from October 1, 2015.

Our average LCR of 145 % (twelve months average) has been calculated in accordance with the Commission Delegated Regulation (EU) 2015/61 and the EBA Guidelines on LCR disclosure to complement the disclosure of liquidity risk management under Article 435 CRR.

The year-end LCR as of December 31, 2018 stands at 140.37 % compared to 139.70 % as of December 31, 2017.

Concentration of funding and liquidity sources:

For an overview of the concentration of funding and liquidity sources please refer to the section "Liquidity risk exposure" in the Annual Report 2018 on page 143. The information is outlined in the sub-section "Funding diversification", "Composition of external funding sources".

Derivative exposures and potential collateral calls:

The majority of outflows related to derivative exposures and other collateral requirements shown in item 11 are in relation to derivative contractual cashflows that are offset by Other cash inflows shown in item 19.

Other significant outflows relate to the impact of an adverse market scenario on derivatives based on the 24 month historical look back approach, and the posting of additional collateral as a result of a 3 notch downgrade of DB's credit rating.

There are also some smaller outflows assumed in relation to callable excess margin collateral and to margin collateral posted that might need to be upgraded to level 1 collateral under an LCR scenario.

Currency mismatch in the LCR:

The LCR is calculated in all major currencies that make up at least 5% of the total Balance Sheet (EUR, USD, GBP and aggregated in EUR). No explicit LCR risk appetite is set for specific currencies, however, all results are monitored.

Approach to centralized group liquidity management and individual legal entity liquidity management:

Please refer to the section "Liquidity risk management" on page 83 in the Annual Report 2018.

Other items in the LCR calculation that are not captured in the LCR disclosure template but that the institution considers relevant for its liquidity profile:

The Pillar 3 disclosure obligations require Banks to disclose the 12 months rolling averages for each quarter. We do not consider anything else relevant for disclosure.

EU LIQ1 - LCR disclosure template

| in € m. | | Total unweighted value (average) | | | | Total weighted value (average) | | | |
|---|---|----------------------------------|--------------|--------------|--------------|--------------------------------|--------------|--------------|--------------|
| Quarter ending on | | Dec 31, 2018 | Sep 30, 2018 | Jun 30, 2018 | Mar 31, 2018 | Dec 31, 2018 | Sep 30, 2018 | Jun 30, 2018 | Mar 31, 2018 |
| Number of data points used in the calculation of averages | | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| High-quality liquid assets | | | | | | | | | |
| 1 | Total high-quality liquid assets (HQLA) | – | – | – | – | 250 | 255 | 260 | 260 |
| Cash-outflows | | | | | | | | | |
| 2 | Retail deposits and deposits from small business costumers | 180 | 178 | 175 | 172 | 17 | 17 | 17 | 17 |
| of which: | | | | | | | | | |
| 3 | Stable deposits | 97 | 95 | 93 | 92 | 5 | 5 | 5 | 5 |
| 4 | Less stable deposits | 85 | 83 | 82 | 80 | 12 | 12 | 12 | 12 |
| 5 | Unsecured wholesale funding | 213 | 220 | 224 | 227 | 91 | 94 | 96 | 96 |
| of which: | | | | | | | | | |
| 6 | Operational deposits (all counterparties) and deposits in network of cooperative banks | 94 | 97 | 99 | 104 | 23 | 24 | 25 | 26 |
| 7 | Non-operational deposits (all counterparties) | 117 | 121 | 123 | 121 | 66 | 68 | 69 | 68 |
| 8 | Unsecured debt | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 9 | Secured wholesale funding | – | – | – | – | 38 | 42 | 47 | 50 |
| 10 | Additional requirements | 224 | 222 | 215 | 209 | 96 | 97 | 95 | 92 |
| of which: | | | | | | | | | |
| 11 | Outflows related to derivative exposures and other collateral requirements | 53 | 56 | 54 | 51 | 52 | 55 | 53 | 50 |
| 12 | Outflows related to loss of funding on debt products | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 13 | Credit and liquidity facilities | 170 | 166 | 161 | 158 | 43 | 42 | 41 | 41 |
| 14 | Other contractual funding obligations | 51 | 60 | 79 | 94 | 10 | 10 | 10 | 10 |
| 15 | Other contingent funding obligations | 209 | 241 | 269 | 267 | 21 | 22 | 22 | 20 |
| 16 | Total cash outflows | – | – | – | – | 273 | 283 | 287 | 284 |
| Cash - inflows | | | | | | | | | |
| 17 | Secured lending (e.g. reverse repos) | 272 | 277 | 292 | 299 | 38 | 41 | 45 | 48 |
| 18 | Inflows from fully performing exposures | 45 | 44 | 43 | 42 | 32 | 32 | 32 | 31 |
| 19 | Other cash inflows | 38 | 40 | 38 | 34 | 38 | 39 | 38 | 34 |
| 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 | – | – | – | – | 7 | 7 | 8 | 10 |
| EU 19b | Excess inflows from a related specialized credit institution | – | – | – | – | 0 | 0 | 0 | 0 |
| 20 | Total cash inflows | 354 | 361 | 373 | 375 | 101 | 105 | 106 | 104 |
| of which: | | | | | | | | | |
| EU 20a | Fully exempt inflows | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EU 20b | Inflows subject to 90 % cap | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EU 20c | Inflows subject to 75 % cap | 300 | 307 | 321 | 327 | 101 | 105 | 106 | 104 |
| Total adjusted value | | | | | | | | | |
| 21 | Liquidity buffer | – | – | – | – | 250 | 255 | 260 | 260 |
| 22 | Total net cash outflows | – | – | – | – | 172 | 177 | 181 | 180 |
| 23 | Liquidity coverage ratio (%) | – | – | – | – | 145 | 144 | 144 | 144 |

The Net Stable Funding Ratio (NSFR):

Basel 3 also contains a proposal to introduce a net stable funding ratio (NSFR) to reduce medium to long-term funding risks by requiring banks to fund their activities with sufficiently stable sources of funding. The NSFR requires banks to maintain a stable funding profile in relation to their on- and off-balance sheet activities. The ratio is defined as the amount of Available Stable Funding (the portion of capital and liabilities expected to be a stable source of funding), relative to the amount of Required Stable Funding (a function of the liquidity characteristics of various assets held).

In the EU, the Commission published a legislative proposal to amend the CRR. The proposal defines, inter alia, a mandatory quantitative NSFR requirement and which would apply two years after the proposal comes into force. The proposal remains subject to change in the EU legislative process. Therefore, for banks domiciled in the EU, the final definition of the ratio and associated implementation timeframe has not yet been confirmed.

Business risk

Business risk economic capital methodology captures a tax risk component, a capital charge for deferred tax on temporary differences and strategic risk, which also implicitly includes elements of non-standard risks including refinancing and reputational risk.

Economic capital usage for business risk by business division

| in € m. | Dec 31, 2018 | Dec 31, 2017 | 2018 increase (decrease) from 2017 | |
|-----------------------------|--------------|--------------|------------------------------------|-------------|
| | | | in € m. | in % |
| Corporate & Investment Bank | 3,521 | 4,435 | (914) | (21) |
| Private & Commercial Bank | 29 | 10 | 19 | 202 |
| Asset Management | 0 | 99 | (99) | (100) |
| Corporate & Other | 1,208 | 1,133 | 75 | 7 |
| Total | 4,758 | 5,677 | (918) | (16) |

Economic capital usage for business risk as of December 31, 2018 was € 4.76 billion, representing a € 0.9 billion (16 %) decrease compared to December 31, 2017. Strategic risk economic capital of € 3.39 billion was down from € 4.48 billion in 2017, with the decrease being driven by a better earnings outlook in our plan for 2019 compared to the one for 2018 in the previous year. Economic capital usage related to tax matters was broadly flat year on year.

The strategic risk economic capital model calculates potential unexpected operating losses under extreme adverse scenarios due to decreases in operating revenues that cannot be compensated by cost reductions. To avoid double-counting, revenue or cost fluctuations related to market risk, credit risk or operational risk are not considered. The model reflects business-specific, historical revenue volatilities as well as the business 12-month earnings forecasts. Key macro-economic or financial revenue drivers are included to model dependencies between business units.

Strategic risk economic capital is managed via the Strategic and Capital plan, which is developed annually and presented to the Management Board for discussion and approval. The final plan is then presented to the Supervisory Board. During the year, execution of business strategies is regularly monitored to assess the performance against strategic objectives and to ensure we remain on track to achieve targets.

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