



# Pillar 3 Report 2019



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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) 575/2013 on prudential requirements for credit institutions and investment firms” (Capital Requirements Regulation or “CRR”) and the “Directive (EU) 2013/36 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms” (Capital Requirements Directive or “CRD”) which have been further amended with subsequent Regulations and Directives. Germany implemented the CRD disclosure 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\*). 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

In the European Union, the Basel 3 capital framework is implemented by the amended versions of CRR and CRD. 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 capital requirements, regulatory own funds, leverage and liquidity as well as other relevant regulations. In addition, the CRD was implemented into German law by means of further amendments to the KWG and the German Solvency Regulation (SolV) and accompanying regulations. Jointly, these laws and regulations represent the regulatory framework applicable in Germany.

Regarding the regulatory minimum capital requirements the CRR/CRD lays the foundation for the calculation of risk weighted assets (RWA) for credit risk, including counterparty credit risk, credit valuation adjustments, market risk and operational risk.

In January 2019, Regulations (EU) 2017/2401 and 2017/2402 introduced changes to the methodology for determining RWAs for new securitizations originated on or after January 1, 2019. All securitization transactions originated before this date remained subject to the rules introduced by CRR/CRD as applicable until December 31, 2018 and will be subject to the new framework on January 1, 2020.

In May 2019, Regulation (EU) 2019/876 and Directive (EU) 2019/878 introduced amendments to the CRR/CRD with various changes to the credit risk RWA framework becoming applicable in June 2021. These relate to the applicable risk weights for banking book investments in collective investment undertakings or the replacement of the mark-to-market method to determine the exposure value for derivatives that are not in scope of the internal model method by a new standardized approach to determine counterparty credit risk (SA-CCR).

A further core element of the CRR/CRD framework is the development and maintenance of a high quality capital base which should primarily consist of Common Equity Tier 1 (CET 1). The 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 are fully effective from 2019 onwards.

Further capital components considered for regulatory purposes are Additional Tier 1 (AT1) and Tier 2 (T2) capital. However, for these certain transitional arrangements are still in place which were introduced by the CRR/CRD applicable until June 26, 2019. Capital instruments that no longer qualify as AT1 or T2 capital under these 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 40 % in 2018, 30 % in 2019 and the cap decreasing by ten percentage points every year thereafter.

We present in this report certain figures based on our definition of own funds (applicable for Additional Tier 1 capital and Tier 2 capital and figures based thereon, including Tier 1 capital and Leverage Ratio) on a “fully loaded” basis. The term “fully loaded” is defined as excluding the transitional arrangements for own funds introduced by the CRR/CRD applicable until June 26, 2019. However, it reflects the latest transitional arrangements introduced by the amendments to the CRR/CRD applicable from June 27, 2019.

The CRR/CRD 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. With effect from June 2021 the leverage exposure measure will be modified, e.g. the exposure measure for derivatives is determined based on a new standardized approach for counterparty credit risk and pending settlement receivables may be netted with pending settlement payables subject to further requirements, and a minimum leverage ratio requirement of 3 % is introduced. From January 1, 2022 an additional leverage ratio buffer requirement of 50 % of the applicable G-SIB buffer rate will apply. It is currently expected that this additional requirement will equal 0.75 %.

The CRR/CRD framework further defines 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. The binding minimum liquidity coverage ratio is set to 100 % since 2018.

The Net Stable Funding Ratio (NSFR) requires banks to maintain a stable funding profile in relation to their on- and off-balance sheet exposures. The CRR/CRD requires banks to calculate and disclose certain items requiring and providing stable funding. With effect from June 2021 a minimum Net Stable Funding Ratio of 100 % is introduced.

There are continuous improvements and additional regulatory guidance provided with regard to the interpretations of the CRR/CRD rules and related binding Technical Standards are still in preparation or 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 measures may not be comparable to previous expectations. Also, our CRR/CRD 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.

## TLAC and European MREL (SRMR/BRRD)

The key change regarding the amendments to CRR that is applicable from June 27, 2019 relates to the introduction of a total loss-absorbing capacity ("TLAC") requirement which implements the internationally agreed TLAC standard as documented in the Financial Stability Board's (FSB) TLAC term sheet in Europe.

Global Systemically Important Institutions (G-SIIs) in Europe now need to have at least 16 % plus the combined buffer requirement of their Risk Weighted Assets (RWA) or 3 % of their Leverage Ratio Exposure (LRE) as TLAC. The requirement will increase to 18 % plus the combined buffer requirement of RWA or 3.75 % of LRE starting 2022.

Banks in the European Union are also 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").

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. MREL is expressed as a percentage of Total Liabilities and Own Funds ("TLOF").

Instruments which qualify for TLAC and 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). Instruments qualifying for TLAC need to be fully subordinated to general creditor claims (e.g. senior non-preferred bonds) while this is not required for MREL (e.g. senior preferred bonds). Nevertheless, current and future MREL regulation allows the SRB to also set an additional "subordination" requirement within MREL (but separate from TLAC) against which only subordinated liabilities and own funds can be counted.

## 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 CRD 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.

## Prudential measures for non-performing exposure

In April 2019 the EU published final regulations for a prudential backstop reserve for non-performing loans, which will result in a deduction from CET 1 capital when a minimum loss coverage requirement is not met. We expect first impacts on our CET 1 ratio in 2021, as these rules apply to newly originated assets after application date and foresee a two year grace period before the defined backstop requirements apply.

In addition, in March 2018 ECB published its “Addendum to the ECB Guidance to banks on non-performing loans: supervisory expectations for prudential provisioning of non-performing exposures” and in August 2019 its “Communication on supervisory coverage expectations for NPEs”. These guidances are applicable to all newly defaulted loans after April 1, 2018 and, similar to the EU rules, it requires banks to take measures in case a minimum impairment coverage requirement is not met. Within the annual SREP discussions ECB may impose Pillar 2 measures on banks in case ECB is not confident with measure taken by the individual bank. In line with the ECB guidance we do not expect an impact earlier than in the third quarter of 2020.

In its 2019 SREP letter, ECB asks us to apply ECB’s non-performing backstop requirements to the stock of Non-Performing Loans starting year end 2020. Similar to the Addendum to the ECB Guidance to banks on non-performing loans this measure will be evaluated as part of the annual SREP process.

# 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), including recent amendments. 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 2019. 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 2019.

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 153.

## 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 preparation 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 2019 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 affected, process of disclosure implementation and quality assurance in the preparation 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

This Pillar 3 Report is published on the bank's website at [db.com/ir/en/regulatory-reporting.htm](http://db.com/ir/en/regulatory-reporting.htm)

This 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 2019. 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 2019.

### 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, 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 measurement and reporting 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 and risk diversification, Capital, Leverage Ratio, TLAC 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)	Own funds, Capital instruments, Minimum capital requirements and additional capital buffers, Development of own funds
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, TLAC 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, TLAC 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 19 - Allowance for credit losses
Unencumbered assets (Article 443)	Liquidity risk exposure, Note 20 - Transfer of financial assets, assets pledged and received as collateral, Note 37 - 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 27 – 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 16 - Equity method investments, Note 44 - 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 39 – Current and non-current assets and liabilities Note 40 – Events after the reporting period Note 42 – 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 2019 under sections “Risk management principles” on page 55 and “Risk governance” on page 56.

### Credit risk management strategies and processes

The management of credit risk is described in section “Credit risk management” on page 66 in the 2019 Annual Report.

### Market risk management strategies and processes

The management of market risk is described in section “Market risk management” on page 79 in the 2019 Annual Report.

### Liquidity risk management strategies and processes

The management of liquidity is described in section “Liquidity risk management” on page 90 in the 2019 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 66 and 94 respectively in the 2019 Annual Report.

### Operational risk management strategies and processes

The management of operational risk is described in section “Operational risk management” on page 85 in the 2019 Annual Report.

### Reputational Risk Management strategies and processes

The management of reputational risk is described in section “Reputational risk management” on page 95 of the 2019 Annual Report.

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

Deutsche Bank discloses the overall risk management structure and organization in the 2019 Annual Report, chapter “Risk and capital framework”, section “Risk governance” on page 56.

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 66 in the 2019 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 2019 Annual Report, specifically in the chapter “Market risk framework” on page 79, “Trading market risk” on page 79 and “Nontrading market risk” on page 82.

## Liquidity risk management structure and organization

The structure and organization of liquidity risk management is described in section “Liquidity risk management”, in the 2019 Annual Report, specifically in the chapter “Liquidity risk management framework” on page 90, “Capital markets issuance” on page 92 and “Short term liquidity and wholesale funding” on page 90.

## Business risk management structure and organization

Business risk is managed by the ERM Frameworks team within Enterprise Risk Management. Further detail is provided in section “Business (strategic) risk management” in the 2019 Annual Report on page 94.

## Operational risk management structure and organization

The structure and organization of operational risk management is described in section “Operational risk management” on page 85 in the 2019 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 95 in the 2019 Annual Report.

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

The nature of our risk measurement and reporting systems are described in the section “Risk measurement and reporting systems” on page 62 of the Annual Report 2019.

## Scope and nature of credit risk measurement and reporting systems

The scope and nature of our credit risk measurement and reporting systems are described in the section “Risk measurement and reporting systems” on page 62 of the Annual Report 2019.

## Scope and nature of market risk measurement and reporting systems

The scope and nature of our market risk measurement and reporting systems are described in the section “Risk measurement and reporting systems” on page 62 of the Annual Report 2019.

## Scope and nature of liquidity risk measurement and reporting systems

The scope and nature of our liquidity risk measurement and reporting systems are described in the section “Liquidity risk management” on page 90 and onwards of the Annual Report 2019.

## Scope and nature of business risk measurement and reporting systems

Please refer to the section “Capital requirements”, chapter “Business risk economic capital model” on page 35 of this Pillar 3 report.

## Scope and nature of operational risk measurement and reporting systems

The risk reporting and measurement methodology are described in section “Operational risk management” on page 85 in the 2019 Annual Report.

## Scope and nature of reputational risk measurement and reporting systems

The scope and nature of our reputational risk measurement and reporting systems are described in the section “Risk measurement and reporting systems” on page 62 of the Annual Report 2019.

## 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 73 in the Annual Report 2019 provides information on how our credit risk is hedged/mitigated on both counterparty and portfolio levels and exposures are disclosed in section "Corporate Bank and Investment Bank credit exposure" and "SCL Risk Mitigation for Credit Exposure" on pages 126 to 130 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 2019 Annual Report on page 82.

### 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 90 and onwards of the Annual Report 2019.

### Policies for hedging and mitigating operational risk

The risk mitigating processes regarding operational risk are described in section "Operational risk management" on page 85 in the 2019 Annual Report. The hedging of operational risk is described in "Article 454 CRR - Use of the Advanced Measurement Approaches to operational risk" on page 155 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 Annual Report 2019, 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 2019
Risk profile	Overall risk assessment (page 52) Risk profile (page 53)
Business strategy	Strategy (page XVIII) Risks and opportunities (page 42) Strategic and capital plan (page 59)
Management of risk	Risk management principles (page 55) Risk governance (page 56) Risk measurement and reporting systems (page 62) Capital management (page 65) Resource limit setting (page 65) Risk identification and assessment (page 66) Credit risk management (page 66) Market risk management (page 79)

	Operational risk management (page 85) Liquidity risk management (page 90) Business (strategic) risk management (page 94) Reputational risk management (page 95) Model risk management (page 94) Risk concentration and risk diversification (page 96)
Risk tolerances	Risk appetite and capacity (page 59)
Key ratios and figures	Risk profile (page 53) Key risk metrics (page 51) Own Funds (page 97) Economic capital (page 106) Leverage ratio (page 107) Credit risk exposure (page 11) Asset quality (page 133) Trading market risk exposures (page 144) Nontrading market risk exposures (page 148) Operational risk exposure (page 150) Liquidity risk exposure (page 151)

On this basis our Management Board, by approving the Annual Report 2019, 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 406 onwards in the Annual Report 2019.

## 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 416 in our Annual Report 2019.

## 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 2019 on page 427.

Page 426 of the Annual Report 2019 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 406 of the Annual Report 2019, 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 2019 provides on pages 411 to 415 similar information for the Supervisory Board with specific information on page 414 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 2019, 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 2019.

The Group Risk Committee generally has held meetings once a week in 2019.

Please refer to our Annual Report 2019, page 62, chapter "Risk and capital framework", section "Risk measurement and reporting 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 (the "regulatory group"). Deutsche Bank Group is subject to the CRR. 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, financial institutions (comprising inter alia financial holding companies, payment institutions, asset management companies) and ancillary services undertakings that are its subsidiaries within the meaning of Article 4 (1) (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 but consolidated according to Art. 18 (4) CRR are subject to proportional consolidation.

Insurance companies and companies outside the banking and financial sector are not consolidated in the regulatory group. 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 an fair value through profit or loss asset.

As of year-end 2019, our regulatory group comprised 422 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 26 credit institutions, two payment institutions, 31 investment firms, 228 financial institutions, 17 financial holding companies, 12 asset management companies and 106 ancillary services undertakings. 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 regulatory group comprised 27 credit institutions, two payment institution, 33 investment firms, 258 financial institutions, 16 financial holding companies, 13 asset management companies and 114 ancillary services undertakings.

49 entities were exempted from regulatory consolidation pursuant to Section 31 (3) KWG in conjunction with Article 19 CRR as per year end 2019 (year end 2018: 53 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 € 3 million as per year end 2019 (year end 2018: € 2 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 2019 (year end 2018: 196 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 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, 2019							
	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	Not subject to capital requirements or subject to deduction from capital	References <sup>1</sup>
<b>Assets:</b>								
Cash and central bank balances	137,592	137,508	137,335	0	0	79,715	0	
Interbank balances (w/o central banks)	9,636	9,346	8,532	0	0	7,693	0	
Central bank funds sold and securities purchased under resale agreements	13,801	13,801	0	13,801	0	6,014	0	
Securities borrowed	428	428	0	428	0	328	0	
Financial assets at fair value through profit or loss								
Trading assets	110,875	109,375	6,617	0	275	107,063	0	
Positive market values from derivative financial instruments	332,931	333,253	67	333,127	36	331,692	0	
Non-trading financial assets mandatory at fair value through profit and loss	86,901	87,083	11,865	71,341	1,732	81,926	1,060	
Financial assets designated at fair value through profit or loss	7	7	7	0	0	7	0	
Total financial assets at fair value through profit or loss	530,713	529,718	18,556	404,468	2,043	520,687	1,060	
Financial assets at Fair Value through OCI								
Financial assets mandatory at fair value through OCI	45,503	45,351	43,901	1,415	34	28,494	0	
Equity Instruments designated at fair value through OCI	0	0	0	0	0	0	0	
Total financial assets at fair value through OCI	45,503	45,351	43,901	1,415	34	28,494	0	
Equity method investments	929	929	929	0	0	929	74	
of which: Goodwill	74	74	0	0	0	0	74	D
Loans at amortized cost	429,841	430,947	406,797	0	23,931	145,346	119	
Property and equipment	4,930	4,888	4,888	0	0	959	0	
Goodwill and other intangible assets	7,029	6,831	0	0	0	0	6,831	D
Other assets	110,359	110,301	33,282	56,955	3,216	47,392	9,457	
of which: Defined benefit pension fund assets	1,025	1,025	0	0	0	0	1,025	F
Assets for current tax	926	923	923	0	0	0	0	
Deferred tax assets	5,986	5,954	4,588	0	0	2,221	1,366	E
<b>Total assets</b>	<b>1,297,674</b>	<b>1,296,924</b>	<b>659,733</b>	<b>477,067</b>	<b>29,223</b>	<b>839,778</b>	<b>18,906</b>	
<b>Liabilities and equity:</b>								
Deposits	572,208	573,362	0	1,647	32	73,412	498,271	
Central bank funds purchased and securities sold under repurchase agreements	3,115	3,115	0	3,115	0	2,349	0	
Securities loaned	259	259	0	259	0	259	0	
Financial liabilities at fair value through profit or loss								
Trading liabilities	37,065	37,073	0	0	0	37,069	(79)	
Negative market values from derivative financial instruments	316,506	316,678	0	315,656	75	315,426	0	
Financial liabilities designated at fair value through profit or loss	50,332	49,978	0	46,938	0	49,726	22	
Investment contract liabilities	544	0	0	0	0	0	0	
Total financial liabilities at fair value through profit or loss	404,448	403,729	0	362,594	75	402,221	(57)	
Other short-term borrowings	5,218	5,283	0	0	0	641	4,642	
Other liabilities	107,964	106,511	0	78,865	0	30,163	21,092	
Provisions	2,622	2,618	0	0	0	390	2,228	
Liabilities for current tax	651	634	0	0	0	123	511	
Deferred tax liabilities	545	439	0	0	0	0	439	
Long-term debt	136,473	137,032	0	0	0	28,864	108,168	
of which: Subordinated long-term debt <sup>2</sup>	7,267	7,267	0	0	0	926	6,342	H.I
Trust preferred securities <sup>2</sup>	2,013	2,013	0	0	0	767	1,245	H.I
Obligation to purchase common shares	0	0	0	0	0	0	0	
<b>Total liabilities</b>	<b>1,235,515</b>	<b>1,234,994</b>	<b>0</b>	<b>446,479</b>	<b>107</b>	<b>539,189</b>	<b>636,540</b>	
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	40,505	40,493	0	0	0	0	40,493	A
Retained earnings	9,644	9,425	0	0	0	0	9,425	B
Common shares in treasury, at cost	(4)	(4)	0	0	0	0	0	A

								Dec 31, 2019
	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	Not subject to capital requirements or subject to deduction from capital	References <sup>1</sup>
Equity classified as obligation to purchase common shares	0	0	0	0	0	0	0	A
Accumulated other comprehensive income, net of tax	421	537	0	0	0	0	537	C
<b>Total shareholders' equity</b>	<b>55,857</b>	<b>55,741</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>55,745</b>	
Additional equity components	4,665	4,665	0	0	0	0	4,665	G
Noncontrolling interests	1,638	1,524	0	0	0	0	1,524	
<b>Total equity</b>	<b>62,160</b>	<b>61,930</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>61,934</b>	
<b>Total liabilities and equity</b>	<b>1,297,674</b>	<b>1,296,924</b>	<b>0</b>	<b>446,479</b>	<b>107</b>	<b>539,189</b>	<b>698,474</b>	

<sup>1</sup> 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.

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

	Dec 31, 2018							
	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	Not subject to capital requirements or subject to deduction from capital	References <sup>1</sup>
<b>Assets:</b>								
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								
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	12,703	84,271	611	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	
Equity method investments	879	877	877	0	0	877	69	
of which: Goodwill	69	69	0	0	0	0	69	D
Loans at amortized cost	400,297	401,653	382,504	77	18,555	128,563	399	
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	D
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	F
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	E
<b>Total assets</b>	<b>1,348,137</b>	<b>1,348,470</b>	<b>675,135</b>	<b>459,877</b>	<b>19,822</b>	<b>870,448</b>	<b>31,061</b>	
<b>Liabilities and equity:</b>								
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								
Trading liabilities	59,924	59,930	0	261	0	59,925	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	3	
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	353,625	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 <sup>2</sup>	7,144	7,144	0	0	0	849	6,295	H.I
Trust preferred securities <sup>2</sup>	3,168	3,168	0	0	0	2,012	1,156	H.I
Obligation to purchase common shares	0	0	0	0	0	0	0	
<b>Total liabilities</b>	<b>1,279,400</b>	<b>1,279,844</b>	<b>0</b>	<b>440,015</b>	<b>171</b>	<b>553,855</b>	<b>661,485</b>	
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	16,715	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

								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 <sup>1</sup>		
in € m.																	
Accumulated other comprehensive income, net of tax								253	382	0	0	0	0	382	C		
<b>Total shareholders' equity</b>								<b>62,495</b>	<b>62,462</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>62,462</b>			
Additional equity components								4,675	4,675	0	0	0	0	4,675	G		
Noncontrolling interests								1,568	1,489	0	0	0	0	1,489			
<b>Total equity</b>								<b>68,738</b>	<b>68,626</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>68,626</b>			
<b>Total liabilities and equity</b>								<b>1,348,137</b>	<b>1,348,470</b>	<b>0</b>	<b>440,015</b>	<b>171</b>	<b>553,855</b>	<b>730,110</b>			

<sup>1</sup> 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.

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

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.

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, 2019 to December 31, 2018 are presented in our Annual Report 2019 in the Management Report section. The chapter "Operating and financial review – Financial position" on page 31 provides a detailed explanation of the same.

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

							Dec 31, 2019						
							a	b	c	d	e		
							Items subject to:						
							Total	Credit risk framework	Counterparty credit risk framework	Securitization framework	Market risk framework		
in € m.													
1	Asset carrying value amount under the regulatory scope of consolidation (as per template EU LI1)						1,296,924	659,732	477,067	29,223	839,778		
2	Liabilities carrying value amount under the regulatory scope of consolidation (as per template EU LI1)						1,234,994	0	446,479	107	539,189		
3	<b>Total net amount under the regulatory scope of consolidation</b>						<b>61,930</b>	<b>659,732</b>	<b>30,588</b>	<b>29,117</b>	<b>300,589<sup>5</sup></b>		
4	Off-balance-sheet amounts						259,956	242,419	2,217	13,598	0		
5a	Differences in valuations for derivatives and SFT (incl. impact from different netting rules) <sup>1</sup>						–	0	71,150	120	0		
5b	Differences in valuations for securitization positions <sup>2</sup>						–	(18,994)	(2,348)	34,498	706		
5c	Differences in valuations for off-balance sheet amounts						–	(142,944)	0	0	0		
6	Differences due to financial collateral considered in standardized approach						–	(3,420)	(255)	0	0		
7	Differences due to consideration of provisions <sup>3</sup>						–	7,443	0	0	0		
8	Differences due to dilution risk						–	7,674	0	0	0		
9	Other differences <sup>4</sup>						–	8,606	1,762	0	0		
10	<b>Exposure amounts considered for regulatory purposes</b>						<b>944,671</b>	<b>760,516</b>	<b>103,113</b>	<b>77,333</b>	<b>3,709<sup>6</sup></b>		

<sup>1</sup> 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.

<sup>2</sup> Included in the sum of € 34.5 billion are € 13.7 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.

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

<sup>4</sup> 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.

<sup>5</sup> Included in the sum of € 300.6 billion are € 3.0 billion net carrying amount attributable to securitization positions in the regulatory trading book covered under the market risk standardized approach.

<sup>6</sup> 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, 2018				
		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)	1,348,470	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 <sup>5</sup>
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) <sup>1</sup>	–	0	141,567	301	0
5b	Differences in valuations for securitization positions <sup>2</sup>	–	(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 <sup>3</sup>	–	6,123	0	0	0
8	Differences due to dilution risk	–	8,208	0	0	0
9	Other differences <sup>4</sup>	–	6,237	2,846	0	0
10	Exposure amounts considered for regulatory purposes	1,018,617	776,777	166,614	69,764	5,251 <sup>6</sup>

<sup>1</sup> 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.

<sup>2</sup> 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.

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

<sup>4</sup> 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.

<sup>5</sup> 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.

<sup>6</sup> 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 2019, Note 44 “Shareholdings” to the consolidated financial statements on pages 375 to 393.

## 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 2019.

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

As of December 31, 2019, 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 (Chapter 2 of Regulation (EU) 2017/2402), 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, norisbank GmbH, Deutsche Bank Europe GmbH and Deutsche Oppenheim Family Office AG (before September 12, 2019, 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, 2019:

- 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 three 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
- BHW Bausparkasse AG, Germany

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

### Article 437 (1) (a,d-e) CRR - Own Funds composition, prudential filters and deduction items

#### Development of Own Funds

Our CRR/CRD Tier 1 capital as of December 31, 2019 amounted to € 50.5 billion, consisting of a Common Equity Tier 1 (CET 1) capital of € 44.1 billion and Additional Tier 1 (AT1) capital of € 6.4 billion. The Tier 1 capital was € 3.6 billion lower than at the end of June 30, 2019, driven by decrease in CET 1 capital of € 2.4 billion and decrease in AT1 capital of € 1.2 billion.

The CET 1 capital decrease of € 2.4 billion was primarily driven by € 2.4 billion net loss attributable to Deutsche Bank shareholders and additional equity components in the second half of the year. The € 2.4 billion net loss was largely attributable to transformation related deferred tax assets valuation adjustments and the impairment of goodwill and other intangible assets and these resulted in an offsetting positive counter-effect in capital-terms as respective deductions of goodwill and other intangible assets lowered by € 0.7 billion, partly offset with negative effect from 10% threshold related deduction of € 0.3 billion. Furthermore, our CET 1 capital decreased due to re-measurement losses related to defined benefit pension plan of € 0.4 billion. Since we did not include an interim profit in our CET 1 capital as a consequence of the negative net income in financial year 2019, no AT1 coupons were accrued in CET 1 capital in accordance with Article 26 (2) CRR.

The € 1.2 billion decrease in AT1 capital was mainly the result of call and redemption of one Legacy Hybrid Tier 1 instrument, recognizable as AT1 capital during the transition period, with a notional amount of € 1.2 billion in the fourth quarter of 2019.

Our fully loaded CRR/CRD Tier 1 capital as of December 31, 2019 was € 48.7 billion, compared to € 51.1 billion at the end of June 30, 2019. Our fully loaded Additional Tier 1 capital amounted to € 4.6 billion as per end of December 31, 2019, unchanged compared to June 30, 2019. Our CET 1 capital amounted to € 44.1 billion as of December 31, 2019, compared to € 46.5 billion as of June 30, 2019.

#### Own Funds template (incl. RWA and capital ratios)

in € m.	Dec 31, 2019		Jun 30, 2019		References <sup>1</sup>
	CRR/CRD fully-loaded	CRR/CRD	CRR/CRD fully loaded	CRR/CRD	
<b>Common Equity Tier 1 (CET 1) capital: instruments and reserves</b>					
Capital instruments, related share premium accounts and other reserves					
1	45,780	45,780	45,583	45,583	A
of which: Instrument type 1 (ordinary shares) <sup>2</sup>	45,780	45,780	45,583	45,583	A
of which: Instrument type 2	0	0	0	0	
of which: Instrument type 3	0	0	0	0	
2	14,814	14,814	15,420	15,420	B
3	537	537	661	661	C
3a	0	0	0	0	
4	N/M	0	N/M	0	
5	837	837	833	833	
5a	(5,390)	(5,390)	(3,012)	(3,012)	B
<b>6</b>	<b>56,579</b>	<b>56,579</b>	<b>59,485</b>	<b>59,485</b>	
<b>Common Equity Tier 1 (CET 1) capital: regulatory adjustments</b>					
7	(1,738)	(1,738)	(1,693)	(1,693)	
8	(6,515)	(6,515)	(7,175)	(7,175)	D
10	(1,126)	(1,126)	(1,080)	(1,080)	E
11	(21)	(21)	(34)	(34)	
12	(259)	(259)	(209)	(209)	
13	(2)	(2)	(0)	(0)	
14	(127)	(127)	(231)	(231)	
15	(892)	(892)	(1,072)	(1,072)	F



in € m.	Dec 31, 2019		Jun 30, 2019		References <sup>1</sup>
	CRR/CRD fully-loaded	CRR/CRD	CRR/CRD fully loaded	CRR/CRD	
16	(15)	(15)	(16)	(16)	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20a	0	0	0	0	
20b	0	0	0	0	
20c	0	0	0	0	
20d	0	0	0	0	
21	(319)	(319)	0	0	E
22	0	0	0	0	
23	0	0	0	0	
25	0	0	0	0	E
25a	0	0	0	0	
25b	0	0	0	0	
26a	N/M	N/M	N/M	N/M	
26b	0	0	0	0	
27	0	0	0	0	
27a	(1,417)	(1,417)	(1,450)	(1,450)	
28	(12,430)	(12,430)	(12,962)	(12,962)	
29	44,148	44,148	46,523	46,523	
<b>Additional Tier 1 (AT1) capital: instruments</b>					
30	4,676	4,676	4,676	4,676	G
31	4,676	4,676	4,676	4,676	G
32	0	0	0	0	
33	N/M	1,813	N/M	3,019	H
34	0	0	0	0	
35	N/M	0	N/M	0	
36	4,676	6,489	4,676	7,695	
<b>Additional Tier 1 (AT1) capital: regulatory adjustments</b>					
37	(91)	(91)	(80)	(80)	G
38	0	0	0	0	
39	0	0	0	0	
40	0	0	0	0	
41a	N/M	N/M	N/M	N/M	

in € m.	Dec 31, 2019		Jun 30, 2019		References <sup>1</sup>
	CRR/CRD fully-loaded	CRR/CRD	CRR/CRD fully loaded	CRR/CRD	
Goodwill and other intangible assets (net of related tax liabilities)	N/M	N/M	N/M	N/M	D
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	(91)	(91)	(80)	(80)	
44 Additional Tier 1 (AT1) capital	4,584	6,397	4,595	7,614	
45 Tier 1 capital (T1 = CET 1 + AT1)	48,733	50,546	51,119	54,138	
<b>Tier 2 (T2) capital: instruments and provisions</b>					
46 Capital instruments and the related share premium accounts <sup>11</sup>	7,906	6,092	9,170	6,151	I
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	I
48 Qualifying own funds instruments included in consolidated T2 capital issued by subsidiaries and held by third parties	15	15	22	22	I
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	7,920	6,107	9,192	6,172	
<b>Tier 2 (T2) capital: regulatory adjustments</b>					
52 Direct, indirect and synthetic holdings by an institution of own T2 instruments and subordinated loans (negative amount)	(150)	(150)	(154)	(154)	I
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) <sup>9</sup>	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: 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	(150)	(150)	(154)	(154)	
58 Tier 2 (T2) capital	7,770	5,957	9,037	6,018	
59 Total capital (TC = T1 + T2)	56,503	56,503	60,156	60,156	
60 Total risk-weighted assets	324,015	324,015	346,878	346,878	
of which:					
Credit Risk (including Settlement Risk)	221,302	221,302	227,431	227,431	
Credit Valuation Adjustment (CVA)	4,683	4,683	6,219	6,219	
Market Risk	25,368	25,368	29,033	29,033	
Operational Risk	72,662	72,662	84,195	84,195	
<b>Capital ratios and buffers</b>					
61 Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets)	13.6	13.6	13.4	13.4	
62 Tier 1 capital ratio (as a percentage of risk-weighted assets)	15.0	15.6	14.7	15.6	
63 Total capital ratio (as a percentage of risk-weighted assets)	17.4	17.4	17.3	17.3	
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) <sup>12</sup>	11.8	11.8	11.8	11.8	
of which:					
65 Capital conservation buffer requirement	2.5	2.5	2.5	2.5	
66 Countercyclical buffer requirement	0.08	0.08	0.07	0.07	
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	2.0	2.0	2.0	
68 Common Equity Tier 1 capital available to meet buffers (as a percentage of risk-weighted assets) <sup>13</sup>	13.5	13.6	13.2	13.4	
Amounts below the thresholds for deduction (before risk weighting)					

in € m.	Dec 31, 2019		Jun 30, 2019		References <sup>1</sup>
	CRR/CRD fully-loaded	CRR/CRD	CRR/CRD fully loaded	CRR/CRD	
72	3,049	3,049	3,487	3,487	
73	794	794	799	799	
75	4,588	4,588	4,447	4,447	
76	0	0	0	0	
77	216	216	244	244	
78	0	0	0	0	
79	1,059	1,059	1,079	1,079	
80	N/M	0	N/M	0	
81	N/M	0	N/M	0	
82	N/M	3,758	N/M	3,758	
83	N/M	0	N/M	0	
84	N/M	1,013	N/M	1,013	
85	N/M	0	N/M	0	

N/M – Not meaningful

<sup>1</sup> References provide the mapping of regulatory balance sheet items used to calculate regulatory capital as reflected in the column "References" in the section "EU LI1 – Differences between accounting and regulatory scopes of consolidation and the mapping of financial statement categories with regulatory risk categories". Where applicable, more detailed information is provided in the respective reference footnote section.

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

<sup>3</sup> 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).

<sup>4</sup> The € 1.7 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 € 0.1 billion.

<sup>5</sup> 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.

<sup>6</sup> 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 fair value gains and losses on derivative liabilities of the institution that result from changes in the own credit risk of the institution according to Article 33 (1) (c) CRR.

<sup>7</sup> Excludes holdings that are already considered in the accounting base of Common Equity.

<sup>8</sup> Based on our current interpretation no deduction amount expected.

<sup>9</sup> Prudential filter for fund for home loans and savings protection ("Fonds zur baupartetechnischen Absicherung").

<sup>10</sup> Includes € 0.4 billion capital deduction effective from April 2019 and € 0.3 billion effective from October 2016 based on regular ECB review and € 0.8 billion capital deduction based on ECB guidance on irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme effective from January 2018 onwards.

<sup>11</sup> Amortization is taken into account.

<sup>12</sup> Includes Pillar 2 Requirement.

<sup>13</sup> Calculated as the CET 1 capital less any CET 1 items used to meet Tier 1 and Total capital requirements.

<sup>14</sup> The term "fully loaded" is defined as excluding the transitional arrangements for own funds introduced by the CRR/CRD applicable until June 26, 2019. The grandfathered instruments is recognized under AT1 instruments under transitional rule until end of 2021. However starting 2022 these instruments will be de-recognized from regulatory capital based on CRR/CRD regulations which is effective from June 27, 2019 and which will reduce the "fully loaded" Tier2 capital by € 2.1 billion.

<sup>A</sup> Common shares, additional paid-in capital and common shares in treasury reflect regulatory eligible CET 1 capital instruments.

<sup>B</sup> The position retained earnings in the regulatory balance sheet includes net income (loss) attributable to Deutsche Bank shareholders and additional equity components of € (5,390) million (June 2019: € (3,012) million). This item is excluded from the position retained earnings in the Own funds template (incl. RWA and capital ratios) and shown separately along with accrual for dividend and AT1 coupons of € 0 million (June 2019: € 0 million) in the position independently reviewed interim profits net of any foreseeable charge or dividend.

<sup>C</sup> Difference to regulatory balance sheet position driven by prudential filters for unrealized gains and losses.

<sup>D</sup> Regulatory applicable amount is goodwill and other intangible assets of € 6,831 million (June 2019: € 7,513 million) plus goodwill from equity method investments of € 74 million (June 2019: € 74 million) as per regulatory balance sheet reduced by deferred tax liabilities on other intangibles of € 390 million (June 2019: € 411 million). Total CET 1 deduction amount is phased-in at a rate of 100 % effective from 2018 onwards.

<sup>E</sup> Differences to balance sheet position mainly driven by adjustments as set out in Article 38 (2) to (5) CRR (e.g. regulatory offsetting requirements).

<sup>F</sup> Regulatory applicable amount is defined benefit pension fund assets of € 1,025 million (June 2019: € 1,072 million) reduced by deferred tax liabilities on defined benefit pension fund assets of € 133 million (June 2019: € 0 million). Total CET 1 deduction amount is phased-in at a rate of 100 % effective from 2018 onwards.

<sup>G</sup> Additional equity components reflects regulatory eligible AT1 capital instruments.

<sup>H</sup> 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).

<sup>I</sup> 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 Own Funds

in € m.	Dec 31, 2019	Jun 30, 2019
<b>Total shareholders' equity per accounting balance sheet</b>	<b>55,857</b>	<b>58,742</b>
Deconsolidation/Consolidation of entities	(116)	(89)
of which:		
Additional paid-in capital	(12)	(13)
Retained earnings	(220)	(216)
Accumulated other comprehensive income (loss), net of tax	116	140
<b>Total shareholders' equity per regulatory balance sheet</b>	<b>55,741</b>	<b>58,653</b>
Minority Interests (amount allowed in consolidated CET 1)	837	833
Accrual for dividend and AT1 coupons <sup>1</sup>	0	0
Reversal of deconsolidation/consolidation of the position Accumulated other comprehensive income (loss), net of tax, during transitional period	0	0
<b>Common Equity Tier 1 (CET 1) capital before regulatory adjustments</b>	<b>56,579</b>	<b>59,485</b>
Prudential filters	(1,888)	(1,958)
of which:		
Additional value adjustments	(1,738)	(1,693)
Any increase in equity that results from securitized assets	(2)	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	(148)	(265)
Regulatory adjustments relating to unrealized gains and losses pursuant to Art. 467 and 468 CRR	0	0
Regulatory adjustments	(10,543)	(11,004)
of which:		
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(6,515)	(7,175)
Deferred tax assets that rely on future profitability	(1,445)	(1,080)
Negative amounts resulting from the calculation of expected loss amounts	(259)	(209)
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	(892)	(1,072)
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 <sup>2</sup>	(1,433)	(1,467)
<b>Common Equity Tier 1 capital</b>	<b>44,148</b>	<b>46,523</b>
<b>Additional Tier 1 capital</b>	<b>6,397</b>	<b>7,614</b>
Additional Tier 1 Notes (AT1 Notes)	4,584	4,595
Per balance sheet	4,665	4,675
Deconsolidation/Consolidation of entities	0	0
Regulatory adjustments to balance sheet position	(80)	(80)
Hybrid capital securities	1,813	3,019
Per balance sheet	2,013	3,269
Deconsolidation/Consolidation of entities	0	0
Regulatory adjustments to balance sheet position	(200)	(250)
Other regulatory adjustments	0	0
Deductions from Additional Tier 1 capital	0	0
<b>Tier 1 capital</b>	<b>50,546</b>	<b>54,138</b>
<b>Tier 2 capital</b>	<b>5,957</b>	<b>6,018</b>
Subordinated debt	5,679	5,739
Per balance sheet	7,267	7,307
Deconsolidation/Consolidation of entities	0	0
Regulatory adjustments to balance sheet position	(1,588)	(1,568)
of which:		
Amortization according to Art. 64 CRR	(957)	(851)
Other	(631)	(717)
Other regulatory adjustments	278	279
Deductions from Tier 2 capital	0	0
<b>Total capital</b>	<b>56,503</b>	<b>60,156</b>

<sup>1</sup> 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).

<sup>2</sup> Includes € 0.4 billion capital deduction effective from April 2019 and € 0.3 billion effective from October 2016 based on regular ECB review, € 0.8 billion capital deduction based on ECB guidance on irrevocable payment commitments related to the Single Resolution Fund and the Deposit Guarantee Scheme effective from January 2018 onwards and € 15 million from Direct, indirect and synthetic holdings by an institution of own CET1 instruments.

## Development of Own Funds

in € m.	six months ended Dec 31, 2019	six months ended Jun 30, 2019
<b>Common Equity Tier 1 (CET 1) capital - opening amount</b>	<b>46,523</b>	<b>47,486</b>
Common shares, net effect	0	0
of which:		
New shares issued (+)	0	0
Shares retired (-)	0	0
Additional paid-in capital	188	65
Retained earnings	(2,984)	(3,889)
of which:		
Actuarial gains (losses) rel. to defined benefit plans, net of tax and Currency Translation Adjustment (CTA)	(602)	(385)
Net income attributable to Deutsche Bank Shareholders	(2,378)	(3,012)
Common shares in treasury, net effect/(+) sales (-) purchase	8	3
Movements in accumulated other comprehensive income	(124)	279
of which:		
Foreign currency translation, net of tax	132	(24)
Unrealized gains and losses	(228)	290
Other	(29)	13
Accrual for dividend and Additional Tier 1 (AT1) coupons <sup>1</sup>	0	0
of which:		
Gross dividends (deduction)	0	0
Shares issued in lieu of dividends (add back)	0	0
Gross AT1 coupons (deduction)	0	0
Additional value adjustments	(45)	(190)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	661	1,390
Deferred tax assets that rely on future profitability (excluding those arising from temporary differences)	(46)	1,678
Negative amounts resulting from the calculation of expected loss amounts	(50)	158
Removal of gains/losses resulting from changes in own credit standing in liabilities designated at fair value (net of tax)	104	73
Defined benefit pension fund assets (net of related tax liabilities) (negative amount)	181	38
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)	(319)	0
Other, including regulatory adjustments	50	(569)
<b>Common Equity Tier 1 (CET 1) capital - closing amount</b>	<b>44,148</b>	<b>46,523</b>
<b>Additional Tier 1 (AT1) capital - opening amount</b>	<b>7,614</b>	<b>7,604</b>
New Additional Tier 1 eligible capital issues	0	0
Matured and called instruments	(1,216)	0
Transitional arrangements	0	0
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	0
Negative amounts resulting from the calculation of expected loss amounts	0	0
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities	0	0
Other, including regulatory adjustments	(1)	10
<b>Additional Tier 1 (AT1) capital - closing amount</b>	<b>6,397</b>	<b>7,614</b>
<b>Tier 1 capital (T1 = CET 1 + AT1)</b>	<b>50,546</b>	<b>54,138</b>
<b>Tier 2 (T2) capital - opening amount</b>	<b>6,018</b>	<b>6,202</b>
New Tier 2 eligible capital issues	0	0
Matured and called instruments	(0)	(1)
Amortization adjustments	(116)	(95)
Transitional arrangements	0	0
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	0
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities	0	0
Other, including regulatory adjustments	55	(88)
<b>Tier 2 (T2) capital - closing amount</b>	<b>5,957</b>	<b>6,018</b>
<b>Total regulatory capital (TC = T1 + T2)</b>	<b>56,503</b>	<b>60,156</b>

<sup>1</sup> 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 437a (a-d) CRR - Own funds and eligible liabilities

Our available minimum own funds and eligible liabilities (MREL) as of December 31, 2019, amounted to € 115 billion, consisting of a total loss absorbing capacity (TLAC) of € 112 billion and further eligible liabilities from senior preferred plain vanilla liabilities instruments of € 3 billion.

### Own funds and eligible liabilities disclosure ordered by insolvency hierarchy

in € m. (unless stated otherwise)	Dec 31, 2019	Jun 30, 2019
<b>Regulatory capital elements of TLAC/MREL</b>		
Common Equity Tier 1 capital (CET 1)	44,148	46,523
Additional Tier 1 (AT1) capital instruments eligible under TLAC/MREL	6,397	7,614
Tier 2 (T2) capital instruments eligible under TLAC/MREL		
Tier 2 (T2) capital instruments before TLAC/MREL adjustments	5,957	6,018
Tier 2 (T2) capital instruments adjustments for TLAC/MREL	16	9
Tier 2 (T2) capital instruments eligible under TLAC/MREL	5,973	6,027
<b>Total regulatory capital elements of TLAC/MREL</b>	<b>56,519</b>	<b>60,165</b>
<b>Other elements of TLAC/MREL</b>		
Senior non-preferred plain vanilla		
o/w residual maturity >= 1 year and <2 years (Art 437a(a))	18,001	14,791
o/w residual maturity >= 2 years (Art 437a(a))	37,802	44,697
Total Senior non-preferred plain vanilla	55,803	59,488
Holdings of eligible liabilities instruments of other G-SIIs (TLAC only)	0	(35)
<b>Total Loss Absorbing Capacity (TLAC)</b>	<b>112,322</b>	<b>119,618</b>
Add back of holdings of eligible liabilities instruments of other G-SIIs (TLAC only)	0	35
<b>Available Own Funds and subordinated Eligible Liabilities (subordinated MREL)</b>	<b>112,322</b>	<b>119,653</b>
Senior preferred plain vanilla		
o/w residual maturity >= 1 year and <2 years (Art 437a(a))	20	0
o/w residual maturity >= 2 years (Art 437a(a))	2,836	1,045
Total Senior preferred plain vanilla	2,856	1,045
<b>Available Minimum Own Funds and Eligible Liabilities (MREL)</b>	<b>115,178</b>	<b>120,698</b>
<b>Risk Weighted Assets (RWA)</b>	<b>324,015</b>	<b>346,878</b>
<b>Leverage Ratio Exposure (LRE)</b>	<b>1,168,040</b>	<b>1,304,162</b>
Total amount of liabilities excluded from eligible liabilities items (Art 437a(d))	455,119	0
<b>Total liabilities and own funds after prudential netting (TLOF)</b>	<b>995,513</b>	<b>1,104,731</b>
<b>TLAC ratio</b>		
TLAC ratio (as percentage of RWA)	34.67	34.48
<b>TLAC requirement (as percentage of RWA)</b>	<b>20.58</b>	<b>20.57</b>
TLAC ratio (as percentage of Leverage Exposure)	9.62	9.17
TLAC requirement (as percentage of Leverage Exposure)	6.00	6.00
TLAC surplus over RWA requirement	45,633	48,279
TLAC surplus over LRE requirement	42,239	41,369
<b>MREL subordination<sup>1</sup></b>		
MREL subordination ratio (as percentage of TLOF)	11.28	-
MREL subordination requirement (as percentage of TLOF)	6.11	-
Surplus over MREL subordination requirement	51,496	-
<b>MREL ratio</b>		
MREL ratio (as percentage of TLOF)	11.57	10.93
MREL requirement (as percentage of TLOF)	8.58	9.14
MREL surplus over requirement	29,763	19,726

<sup>1</sup> No MREL subordination requirement as of June 30, 2019

As of December 31, 2019 TLOF were € 996 billion and available MREL were € 115 billion, corresponding to a ratio of 11.57 %. This means that Deutsche Bank has a comfortable MREL surplus of € 30 billion above our MREL requirement of € 85 billion (i.e. 8.58 % of TLOF). € 112 billion of our available MREL were subordinated, corresponding to a MREL subordination ratio of 11.28 %, representing a surplus of € 51 billion over our subordination requirement of € 61 billion (i.e. 6.11 % of TLOF).

As of December 31, 2019 TLAC was € 112 billion and the corresponding TLAC ratios were 34.7 % (RWA based) and 9.6 % (Leverage exposure based). This means that Deutsche Bank has a comfortable TLAC surplus of € 42 billion over its total loss absorbing capacity minimum requirement of € 70 billion (6.00 % Leverage exposure based).

## Main features of eligible liabilities instruments

As of December 31, 2019, 56 % of DB's senior non-preferred MREL/TLAC eligible instruments in terms of volume with remaining tenor of > 1 year are public benchmarks with volume-weighted average original tenor of 2.6 years. 79 % out of these senior non-preferred benchmarks have a fixed coupon rate with a volume-weighted average coupon of 2.6 % and remaining maturity of 2.5 years. The main funding currencies are Euro and US Dollar which provide more than 92 % of our senior non-preferred public benchmarks.

A description of the main features of our senior non-preferred plain vanilla, TLAC and subordinated MREL eligible liabilities instruments issued by Deutsche Bank is published on Deutsche Bank's website ([db.com/ir/en/capital-instruments.htm](http://db.com/ir/en/capital-instruments.htm)).

The following table provides a simplified overview of the ranking of liabilities in an insolvency proceeding under German law. The ranking is presented from the more junior liabilities to the more senior liabilities. Deutsche Bank AG's eligible liabilities for TLAC and MREL which meet all of the conditions in CRR Article 72b (2) or are grandfathered pursuant to CRR Article 494b (3) rank at position 11 in the below order. Senior preferred eligible liabilities which are eligible for MREL only rank in position 12. There are no liabilities included in Deutsche Bank's eligible liabilities instruments as per CRR Article 72b (3) and (4).

### Ranking of liabilities in an insolvency proceeding under German law

Rank	Label of claims	Code
1	Common equity Tier 1 instruments	Section 199 of the Insolvency Code
2	Additional Tier 1 instruments	Section 39 (2) of the Insolvency Code
3	Tier 2 instruments	
4	Claims subordinated by virtue of a contractual subordination clause not specifying the pertinent rank (other than Additional Tier 1 or Tier 2 instruments)	
5	Claims for repayment of shareholder loans and accrued interest thereon	Section 39 (1) no. 5 of the Insolvency Code
6	Claims for the delivery of goods or provision of services free of charge	Section 39 (1) no. 4 of the Insolvency Code
7	Criminal and administrative fines	Section 39 (1) no. 3 of the Insolvency Code
8	Creditors' costs related to the insolvency proceeding	Section 39 (1) no. 2 of the Insolvency Code
9	Interest and late payment surcharges accrued after the opening of insolvency proceedings	Section 39 (1) no. 1 of the Insolvency Code
10	Claims subordinated by virtue of a contractual subordination clause which specifies the relevant ranking	Section 39 (2) of the Insolvency Code
11	Non-preferred creditor claims arising from non-subordinated, unsecured non-structured debt instruments which  (i) are issued before 21 July 2018 and are neither deposits within the positions of no. 13 and 14 nor money market instruments  (ii) are issued from 21 July 2018 onwards, have an original contractual maturity of at least one year, do not qualify as deposits within the position of no. 13 and 14 and the contractual documentation and, where applicable, the prospectus explicitly refer to the lower ranking	
12	General creditors' claims	Section 38 of the Insolvency Code in conjunction with Section 46f (5) of the Banking Act, including instruments covered by Section 46f (6) sentence 3 and 46f (7) of the Banking Act
13	Deposits not covered, but preferential	Section 46f (4) no. 2 of the Banking Act
14	Deposits covered and preferential	Section 46f (4) no. 1 of the Banking Act
15	Costs of proceeding and obligations binding on the estate	Sections 53 to 55 of the Insolvency Code
16	Claims subject to a right of separation in insolvency proceedings	Sections 49 to 51 of the Insolvency Code
17	Claims subject to a right of segregation in insolvency proceedings	Sections 47 and 48 of the Insolvency Code

## 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](http://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. Further details can be found in Annual Report 2019 under section "Risk identification and assessment" on page 66.
- Capital demand/risk measurement: Risk measurement methodologies and models are applied to quantify the regulatory and economic capital demand which is required to cover all material risks except for those which cannot be adequately limited by capital e.g. liquidity risk. Further details can be found in Annual Report 2019 under sections "Risk profile" and "Capital, Leverage Ratio, TLAC and MREL" on page 53 and 97. Additionally, the following sections below on pages 32 to 35 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
- Capital supply: Capital supply quantification refers to the definition of available capital resources to absorb unexpected losses quantified as part of the capital demand. Further details can be found in Annual Report 2019 under sections "Capital, Leverage Ratio, TLAC and MREL" and "Economic Capital Adequacy" on page 97 and 106.
- Risk appetite: Deutsche Bank has established a set of qualitative statements, quantitative metrics and 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. Further details can be found in Annual Report 2019 under sections "Risk appetite and capacity" and "Key risk metrics" on page 59 and 51.
- Capital planning: The risk appetite thresholds for capital adequacy metrics constitute boundaries which have to be met in our strategic plan to safeguard capital adequacy on a forward-looking basis. Further details can be found in Annual Report 2019 under section "Strategic and capital plan" on page 59.
- Stress testing: Capital plan figures are also considered under various stress test scenarios to prove resilience and overall viability of the bank. Regulatory and economic capital adequacy metrics are also subject to regular stress tests throughout the year to constantly evaluate Deutsche Bank's capital position in hypothetical stress scenarios and to detect vulnerabilities under stress. Further details can be found in Annual Report 2019 under section "Stress testing" on page 61.
- 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 a multi-year assessment of the ability to fulfil all capital-related legal requirements and supervisory demands on an ongoing basis under a baseline and adverse scenario. The economic internal perspective refers to an internal process aimed at capital adequacy using internal economic capital demand models and an internal economic capital supply definition. Both perspectives focus on maintaining the continuity of Deutsche Bank on an ongoing basis.

### 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 39 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  $\pi_{ij}$ . It expresses in percentage terms the probability  $\pi_{ij}$  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 "Economic capital adequacy" in the 2019 Annual Report on page 106.

For detailed information on our Operational risk measurement approaches refer to our Pillar 3 report section "Article 446 CRR - Operational risk measurement" on page 153.

## 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, indirect and operational 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 53 in our Annual Report 2019 for the diversification amount across credit risk, market risk, operational risk and business risk.

## Stress testing

Deutsche Bank has implemented a stress test framework to satisfy internal as well as external stress test requirements. The internal stress tests are based on in-house developed methods and inform a variety of risk management use cases (risk type specific as well as cross risk). Internal stress tests form an integral part of our risk management framework complementing traditional risk measures. The cross-risk stress test framework, the Group Wide Stress Test Framework (GWST), serves a variety of bank management processes, in particular the strategic planning process, the ICAAP, the risk appetite framework and capital allocation. Capital plan stress testing is performed to assess the viability of our capital plan in adverse circumstances and to demonstrate a clear link between risk appetite, business strategy, capital plan and stress testing. The regulatory stress tests, e.g. the EBA stress test and the US-based CCAR (Comprehensive Capital Analysis and Review) stress tests, are strictly following the processes and methodologies as prescribed by the regulatory authorities.

Our internal stress tests are performed on a regular basis in order to assess the impact of a severe economic downturn as well as adverse bank-specific events on our risk profile and financial position. Our stress testing framework comprises regular sensitivity-based and scenario-based approaches addressing different severities and localizations. We include all material risk types into our stress testing activities. These activities are complemented by portfolio- and country-specific downside analysis as well as further regulatory requirements, such as annual reverse stress tests and additional stress tests requested by our regulators on group or legal entity level. 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.

The initial phase of our cross-risk stress test (GWST) 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. In the reporting year, we have introduced an assessment of impacts against the MREL ratio. The time-horizon of internal stress tests is between one and five years, depending on the use case and scenario assumptions. In 2019, we have further strengthened our framework to calculate the stress impacts of a multi-year stress horizon. The Enterprise Risk Committee (ERC) 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 2019 indicated that the bank's capitalization together with available mitigation measures as defined in the Group Recovery Plan allow it to reach the internally set stress exit level. The cross-risk reverse stress test leverages the GWST framework and is 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.

In addition to the GWST that includes all material risk types and major revenue streams for the use cases as indicated above, we have individual stress test programs in place for all relevant risk metrics in line with regulatory requirements. For the relevant stress test programs we refer to the sections describing the individual risk management methods.

Deutsche Bank also took part in two major regulatory stress tests performed in 2019, i.e. the ECB's liquidity stress test exercise as well as the US-based CCAR stress test. The ECB Liquidity Stress Test 2019 (LiST) is a sensitivity analysis of the Bank's liquidity profile based on two idiosyncratic liquidity scenarios over a 6-month horizon defined by the ECB and was successfully completed. In the US, the Federal Reserve (FRB) publicly indicated that it did not object to the capital plans submitted by DB USA Corporation and DWS USA Corporation.

## 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 39 as well as in the Annual Report 2019 under chapter "Capital, Leverage Ratio, TLAC and MREL", section "Minimum capital requirements and additional capital buffers" on page 98.

## 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, 2019		Sep 30, 2019	
		a1	b1	a2	b2
in € m.		RWA	Minimum capital requirements	RWA	Minimum capital requirements
	1	172,515	13,801	176,166	14,093
	of which:				
Art 438(c)(d)	2	16,278	1,302	17,900	1,432
Art 438(c)(d)	3	3,970	318	3,826	306
Art 438(c)(d)	4	145,143	11,611	147,013	11,761
Art 438(d)	5	7,124	570	7,428	594
Art 107	6				
Art 438(c)(d)		28,157	2,253	31,890	2,551
	of which:				
Art 438(c)(d)	7	4,402	352	4,835	387
Art 438(c)(d)	8	0	0	0	0
	9	0	0	0	0
	9a	1,839	147	2,023	162
	10	16,838	1,347	18,839	1,507
Art 438(c)(d)	11	395	32	377	30
Art 438(c)(d)	12	4,683	375	5,816	465
Art 438(e)	13	242	19	41	3
Art 449(o)(i)	14	11,615	929	12,052	964
	of which:				
	15	8,881	710	10,156	812
	of which:				
	16	4,270	342	4,738	379
	17	0	0	0	0
	18	2,734	219	1,897	152
	19	25,368	2,029	31,367	2,509
	of which:				
	20	2,493	199	3,427	274
	21	22,875	1,830	27,940	2,235
Art 438(e)	22	0	0	0	0
Art 438(f)	23	72,662	5,813	78,540	6,283
	of which:				
	24	0	0	0	0
	25	0	0	0	0
	26	72,662	5,813	78,540	6,283
Art 437(2), 48,60	27	13,456	1,077	13,923	1,114
Art 500	28	0	0	0	0
	29	324,015	25,921	343,979	27,518

Our RWA were € 324.0 billion as of December 31, 2019, compared to € 344.0 billion as of September 30, 2019. The decrease of € 20 billion was primarily driven by RWA for operational, credit and market risk. The overall operational risk RWA decrease of € 5.9 billion was mainly driven by model refinements, which linked the use of external loss data closer to the bank's business footprint and improved the use of risk appetite metrics in the capital model. Credit risk RWA (including CCR) decreased by € 7.3 billion as a result of reduction of exposures across our Investment Bank and our Corporate Bank in addition to further wind-downs within our Capital Release Unit in alignment with our strategic announcement. The market risk RWA decrease of € 6.0 billion primarily resulted from decreased SVaR/VaR related exposures and lower IRC as an outcome of business driven reduction initiatives.

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 105, for counterparty credit risk in section "Article 438 (d) CRR - Development of CCR RWA" on page 141 and for market risk in section "Article 455 (e) CRR - Regulatory capital requirements for market risk" on page 149.

## 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. As part of our advanced IRBA we are using supervisory

defined risk weights according to the simple risk weight approach for our equity positions. For all of these positions no credit risk mitigation techniques have been applied.

#### EU CR10 – IRB (specialized lending and equities)

in € m.  
(unless stated otherwise)

Dec 31, 2019

Specialized lending		On-balance sheet amount	Off-balance sheet amount	Risk weight	Exposure amount	RWA	Expected losses
Regulatory categories	Remaining maturity						
Category 1	Less than 2.5 years	124	51	50 %	182	91	0
	Equal to or more than 2.5 years	827	78	70 %	924	647	3
Category 2	Less than 2.5 years	58	42	70 %	74	52	0
	Equal to or more than 2.5 years	79	9	90 %	85	76	1
Category 3	Less than 2.5 years	1	0	115 %	1	1	0
	Equal to or more than 2.5 years	22	2	115 %	25	28	1
Category 4	Less than 2.5 years	0	0	250 %	0	0	0
	Equal to or more than 2.5 years	12	0	250 %	12	31	1
Category 5	Less than 2.5 years	13	0	–	20	0	10
	Equal to or more than 2.5 years	16	0	–	18	0	9
<b>Total</b>	Less than 2.5 years	<b>196</b>	<b>93</b>	<b>–</b>	<b>277</b>	<b>144</b>	<b>10</b>
	Equal to or more than 2.5 years	<b>955</b>	<b>90</b>	<b>–</b>	<b>1,064</b>	<b>782</b>	<b>15</b>

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	975	0	190 %	975	1,852	148
Exchange-traded equity exposures	16	0	290 %	16	47	4
All other equity exposures	1,387	28	370 %	1,412	5,225	418
<b>Total</b>	<b>2,378</b>	<b>28</b>	<b>–</b>	<b>2,403</b>	<b>7,124</b>	<b>570</b>

in € m.  
(unless stated otherwise)

Jun 30, 2019

Specialized lending		On-balance sheet amount	Off-balance sheet amount	Risk weight	Exposure amount	RWA	Expected losses
Regulatory categories	Remaining maturity						
Category 1	Less than 2.5 years	154	100	50 %	252	124	0
	Equal to or more than 2.5 years	729	128	70 %	885	616	3
Category 2	Less than 2.5 years	52	28	70 %	73	51	0
	Equal to or more than 2.5 years	88	54	90 %	131	118	1
Category 3	Less than 2.5 years	2	0	115 %	3	3	0
	Equal to or more than 2.5 years	25	0	115 %	26	30	1
Category 4	Less than 2.5 years	(0)	0	250 %	0	0	0
	Equal to or more than 2.5 years	10	0	250 %	10	26	1
Category 5	Less than 2.5 years	11	0	–	17	0	9
	Equal to or more than 2.5 years	17	0	–	20	0	10
<b>Total</b>	Less than 2.5 years	<b>219</b>	<b>128</b>	<b>–</b>	<b>344</b>	<b>178</b>	<b>9</b>
	Equal to or more than 2.5 years	<b>868</b>	<b>183</b>	<b>–</b>	<b>1,072</b>	<b>789</b>	<b>16</b>

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	477	0	190 %	477	906	73
Exchange-traded equity exposures	29	0	290 %	29	85	7
All other equity exposures	1,626	35	370 %	1,659	6,137	491
<b>Total</b>	<b>2,133</b>	<b>35</b>	<b>–</b>	<b>2,165</b>	<b>7,129</b>	<b>570</b>

## 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, 2019		Jun 30, 2019	
		EAD	RWA	EAD	RWA
<b>Risk Position</b>					
Other non-credit obligation assets - cash	0 %	2,778	0	2,588	0
Other non-credit obligation assets - other	100 %	6,079	6,079	7,417	7,417
<b>Total</b>	–	<b>8,857</b>	<b>6,079</b>	<b>10,005</b>	<b>7,417</b>

Our RWA for other non-credit obligation assets were at € 6.1 billion as of December 31, 2019, compared to € 7.4 billion at the end of June 2019. The decrease of € 1.4 billion was driven by the methodical change to the treatment of the portfolio hedge accounting for mortgage loans.

## Article 441 CRR - Indicators of global systemic importance

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. This is in line with the FSB assessment of systemic importance based on the indicators as published in 2017. According to the recent FSB assessment based on the indicators as published in 2019, the G-SII buffer requirement for Deutsche Bank is reduced to 1.50 %, which will become effective from January 1, 2021. We will continue to publish our indicators on our website:

[db.com/ir/en/regulatory-reporting.htm](http://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 2019.

In addition to these minimum capital requirements, the following combined capital buffer requirements are fully effective beginning 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. This is in line with the FSB assessment of systemic importance based on the indicators as published in 2017. According to the recent FSB assessment based on the indicators as published in 2019, the G-SII buffer requirement for Deutsche Bank is reduced to 1.50 %, which will become effective from January 1, 2021. 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 and equals a requirement of 2.50 % CET 1 capital of RWA in 2019 and onwards.

The countercyclical capital buffer is deployed in a jurisdiction when excess credit growth is associated with an increase in system-wide risk. It may vary between 0 % and 2.50 % CET 1 capital of RWA by 2020. 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, 2019, the institution-specific countercyclical capital buffer was at 0.08 %.

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 2019, no systemic risk buffer applied to Deutsche Bank.

Additionally, Deutsche Bank AG has been classified by BaFin as 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 amounts to 2.00 % in 2019. Unless certain exceptions apply, only the higher of the systemic risk buffer (as of December 31, 2019, not applicable), G-SII buffer and O-SII buffer must be applied.

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 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. Beginning from January 1, 2019, the decision requires Deutsche Bank to maintain a CET 1 ratio, which as of December 31, 2019 is at least 11.83 % 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 combined capital buffer requirement comprising of capital conservation buffer of 2.50 %, the countercyclical buffer of 0.08 % (as per December 31, 2019) and the G-SII capital buffer of 2.00 %. Correspondingly the requirements for Deutsche Bank's Tier 1 capital ratio were at 13.33 % and total capital ratio at 15.33 % as of December 31, 2019.

On December 9, 2019, Deutsche Bank was informed by the ECB of its decision regarding prudential minimum capital requirements for 2020, following the results of the 2019 SREP. The decision acknowledges the progress Deutsche Bank has made since the first SREP assessment in 2016 and requires Deutsche Bank to maintain a CET 1 ratio of at least 11.58 % on a consolidated basis, beginning on January 1, 2020. The decrease is attributable to the reduction in the ECB's Pillar 2 requirement (SREP Add-on) from 2.75 % to 2.50 % which will become effective January 1, 2020. The CET 1 capital requirement comprises the Pillar 1 minimum capital requirement of 4.50 %, the reduced Pillar 2 requirement of 2.50 %, the combined capital buffer requirement comprising of capital conservation buffer of 2.50 %, the countercyclical buffer (0.08 % expected for beginning of 2020) and the G-SII buffer of 2.00 %. Correspondingly, 2020 requirements for Deutsche Bank's Tier 1 capital ratio are at 13.08 % and for its total capital ratio at 15.08 %. Also, following the results of the 2019 SREP, the ECB communicated to Deutsche Bank 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 2019 and 2020:

#### Overview total capital requirements and capital buffers

	2019	2020
<b>Pillar 1</b>		
Minimum CET 1 requirement	4.50 %	4.50 %
Combined buffer requirement	4.58 %	4.58 %
Capital Conservation Buffer	2.50 %	2.50 %
Countercyclical Buffer	0.08 % <sup>1</sup>	0.08 % <sup>1</sup>
Maximum of:	2.00 %	2.00 %
G-SII Buffer	2.00 %	2.00 %
O-SII Buffer	2.00 %	2.00 %
Systemic Risk Buffer	0.00 % <sup>2</sup>	0.00 % <sup>2</sup>
<b>Pillar 2</b>		
Pillar 2 SREP Add-on of CET 1 capital	2.75 %	2.50 %
<b>Total CET 1 requirement from Pillar 1 and 2<sup>3</sup></b>	<b>11.83 %</b>	<b>11.58 %</b>
<b>Total Tier 1 requirement from Pillar 1 and 2</b>	<b>13.33 %</b>	<b>13.08 %</b>
<b>Total capital requirement from Pillar 1 and 2</b>	<b>15.33 %</b>	<b>15.08 %</b>

<sup>1</sup> 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 2020 has been assumed to be 0.08 % as per beginning of the year 2020. The countercyclical buffer is subject to changes throughout the year depending on its constituents.

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

<sup>3</sup> 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.

Further, assuming an unchanged regional portfolio structure of Deutsche Bank's risk weighted assets, already known countercyclical buffer requirements as announced for Germany (0.25 % as of July 1, 2020) and for United Kingdom (increasing from 1.0 % to 2.0 % as of December 16, 2020), will increase our weighted countercyclical buffer requirement to approximately 0.23 % by year end 2020. We note that the announced countercyclical buffer requirement is subject to changes throughout the year.



## 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 the IRC ("Incremental Risk Charge").

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

Dec 31, 2019

in € m.	General credit exposures		Relevant credit exposures – Market risk			Total exposure value
	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	Securitisation exposures Exposure value for non-trading book	
Argentina	30	278	0	0	0	308
Australia	229	2,871	646	0	2,098	5,844
Austria	3	1,640	0	0	0	1,642
Belgium	105	1,863	0	0	9	1,977
Bermuda	33	793	0	0	315	1,140
Brazil	12	932	0	0	0	944
British Virgin Islands	22	8,620	0	0	0	8,642
Bulgaria	0	32	0	0	0	32
Canada	161	1,834	0	0	578	2,572
Cayman Islands	267	4,619	48	0	1,762	6,696
Chile	0	598	0	0	0	598
China	16	5,761	0	0	0	5,777
Czech Republic	28	227	0	0	0	255
Denmark	37	978	0	0	0	1,015
Finland	0	909	11	0	0	920
France	197	8,257	4	0	466	8,924
Germany	7,144	253,313	78	0	6,198	266,732
Hong Kong	11	5,723	0	0	0	5,734
Iceland	0	67	0	0	0	67
India	2,308	7,232	19	0	110	9,668
Indonesia	142	1,636	0	0	0	1,778
Ireland	432	7,293	143	0	2,964	10,832
Israel	7	496	0	0	0	503
Italy (incl. San Marino)	1,266	25,266	27	0	76	26,635
Ivory Coast	0	487	0	0	0	487
Japan	149	2,699	0	0	130	2,978
Jersey	52	1,735	1	0	390	2,178
Lithuania	3	6	0	0	0	9
Luxembourg	3,231	12,091	0	0	4,484	19,806
Malaysia	10	921	0	0	0	931
Mauritius	231	225	0	0	0	456
Mexico	9	1,326	0	0	0	1,336
Netherlands	822	14,118	126	0	636	15,702
Nigeria	0	355	0	0	0	355
Norway	30	1,761	0	0	0	1,791
Pakistan	2	202	0	0	0	204
Poland	20	2,971	0	0	0	2,991
Russian Federation	5	862	0	0	0	867
Saudi Arabia	73	3,171	0	0	0	3,244
Singapore	35	7,218	111	0	0	7,364
Slovakia	0	80	0	0	0	80
South Korea	2	4,844	0	0	0	4,846
Spain	405	21,197	34	0	121	21,756
Sweden	14	1,658	3	0	0	1,674
Switzerland	15	11,423	0	0	0	11,438
Taiwan	3	1,104	0	0	0	1,108
Thailand	1	1,508	0	0	0	1,508
Turkey	28	721	0	0	0	749
Ukraine	0	438	0	0	0	438
United Arab Emirates	40	2,042	0	0	0	2,081
United Kingdom	236	16,713	68	0	1,897	18,915
United States of America (incl. Puerto Rico)	1,739	102,777	1,913	0	51,753	158,182
Vietnam	3	437	0	0	0	440
Other	319	9,897	476	13,337	3,923	27,953
<b>Total</b>	<b>19,925</b>	<b>566,223</b>	<b>3,709</b>	<b>13,337</b>	<b>77,908</b>	<b>681,102</b>

Dec 31, 2019

in € m.	Own funds requirements						
	Relevant credit risk exposures - Credit risk	Relevant credit exposures - Market risk	Relevant credit exposures - Securitisation positions in the non-trading book	Total	Risk-weighted exposure amounts	Own fund requirements weights (%)	Countercyclical buffer rate (%)
Argentina	37	0	0	37	458.33	0.00	0.00
Australia	98	35	29	161	2,016.57	0.01	0.00
Austria	47	0	0	47	587.43	0.00	0.00
Belgium	48	0	0	48	602.94	0.00	0.00
Bermuda	36	0	4	40	500.37	0.00	0.00
Brazil	32	0	0	32	397.40	0.00	0.00
British Virgin Islands	47	0	0	47	588.84	0.00	0.00
Bulgaria	0	0	0	0	6.23	0.00	0.50
Canada	76	0	6	82	1,022.64	0.00	0.00
Cayman Islands	274	2	49	324	4,053.29	0.02	0.00
Chile	22	0	0	22	276.80	0.00	0.00
China	265	0	1	266	3,321.82	0.02	0.00
Czech Republic	9	0	0	9	110.46	0.00	1.50
Denmark	37	0	0	37	464.92	0.00	1.00
Finland	21	0	0	21	259.01	0.00	0.00
France	247	0	13	260	3,244.42	0.02	0.25
Germany	6,647	6	39	6,691	83,640.57	0.39	0.00
Hong Kong	111	0	0	112	1,396.67	0.01	2.50
Iceland	2	0	0	2	27.40	0.00	1.75
India	316	1	6	324	4,044.51	0.02	0.00
Indonesia	73	0	0	73	914.38	0.00	0.00
Ireland	185	16	61	262	3,279.80	0.02	1.00
Israel	24	0	0	24	300.15	0.00	0.00
Italy (incl. San Marino)	1,087	1	9	1,096	13,704.64	0.06	0.00
Ivory Coast	22	0	0	22	270.10	0.00	0.00
Japan	89	0	2	90	1,130.42	0.01	0.00
Jersey	105	1	11	116	1,450.84	0.01	0.00
Lithuania	0	0	0	0	3.78	0.00	1.00
Luxembourg	466	0	51	517	6,456.67	0.03	0.00
Malaysia	25	0	0	25	311.98	0.00	0.00
Mauritius	25	0	0	25	314.41	0.00	0.00
Mexico	33	0	0	33	410.11	0.00	0.00
Netherlands	518	1	7	527	6,588.44	0.03	0.00
Nigeria	20	0	0	20	255.64	0.00	0.00
Norway	36	0	0	36	444.26	0.00	2.50
Pakistan	26	0	0	26	329.60	0.00	0.00
Poland	52	0	0	52	653.37	0.00	0.00
Russian Federation	41	0	0	41	510.86	0.00	0.00
Saudi Arabia	34	0	0	34	419.40	0.00	0.00
Singapore	116	9	0	125	1,563.97	0.01	0.00
Slovakia	1	0	0	1	14.88	0.00	1.50
South Korea	65	0	1	65	816.19	0.00	0.00
Spain	685	3	3	691	8,632.68	0.04	0.00
Sweden	61	0	0	61	760.09	0.00	2.50
Switzerland	192	0	0	192	2,403.52	0.01	0.00
Taiwan	27	0	0	27	342.38	0.00	0.00
Thailand	27	0	0	27	336.06	0.00	0.00
Turkey	44	0	0	44	553.15	0.00	0.00
Ukraine	21	0	0	21	266.84	0.00	0.00
United Arab Emirates	30	0	0	30	380.13	0.00	0.00
United Kingdom	401	3	85	489	6,116.56	0.03	1.00
United States of America (incl. Puerto Rico)	2,354	47	482	2,883	36,040.49	0.17	0.00
Vietnam	31	0	0	31	386.89	0.00	0.00
Other	281	412	72	764	9,555.61	0.04	0.00
<b>Total</b>	<b>15,568</b>	<b>538</b>	<b>929</b>	<b>17,035</b>	<b>212,938.92</b>	<b>1.00</b>	<b>0.08</b>

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in € m.	General credit exposures		Relevant credit exposures – Market risk			Total exposure value
	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	Securitisation exposures Exposure value for non-trading book	
Angola	0	360	0	3	0	363
Argentina	25	355	0	0	0	380
Australia	213	3,033	673	0	698	4,618
Austria	11	1,545	0	0	0	1,557
Belgium	90	1,815	0	115	0	2,020
Bermuda	22	867	0	39	116	1,044
Brazil	6	718	0	0	0	724
British Virgin Islands	106	8,158	0	15	0	8,278
Canada	159	2,679	5	79	359	3,282
Cayman Islands	317	5,789	66	24	982	7,179
China	36	5,462	131	2,436	0	8,066
Czech Republic	19	180	0	4	0	204
Denmark	4	1,563	0	107	0	1,673
Finland	6	782	0	89	0	877
France	97	6,010	185	835	509	7,636
Germany	7,180	240,772	160	3,225	6,125	257,462
Hong Kong	80	5,232	0	147	0	5,458
Iceland	3	24	0	60	0	86
India	2,157	6,805	0	913	0	9,874
Indonesia	50	1,930	0	126	0	2,106
Ireland	574	7,484	345	156	3,521	12,080
Israel	23	449	0	0	0	472
Italy (incl. San Marino)	1,446	23,673	22	0	159	25,300
Japan	102	2,868	0	0	144	3,114
Jersey	154	1,608	2	9	228	2,001
Lebanon	0	633	0	0	0	633
Lithuania	0	4	0	0	0	4
Luxembourg	3,939	13,346	14	182	3,153	20,634
Malaysia	15	921	10	539	0	1,485
Mauritius	335	243	0	0	0	578
Mexico	13	1,852	0	0	0	1,865
Netherlands	1,061	13,144	215	245	327	14,992
Norway	1	2,114	0	188	0	2,303
Pakistan	2	238	0	0	0	240
Philippines	5	749	0	144	0	897
Poland	18	3,514	0	0	0	3,532
Portugal	50	2,948	20	135	17	3,169
Russian Federation	1	624	0	0	0	625
Saudi Arabia	63	5,341	0	0	0	5,404
Singapore	129	9,073	22	591	0	9,815
Slovakia	0	86	0	0	0	86
South Africa	7	540	0	0	0	547
South Korea	9	5,298	0	2,148	0	7,456
Spain	380	20,043	171	318	108	21,021
Sweden	8	1,945	0	0	171	2,124
Switzerland	89	9,535	0	226	0	9,851
Taiwan	42	1,452	0	543	0	2,037
Thailand	0	1,211	0	336	0	1,547
Turkey	1	609	0	38	0	648
United Arab Emirates	13	1,507	0	0	0	1,520
United Kingdom	579	23,411	812	1,807	630	27,238
United States of America (incl. Puerto Rico)	3,626	130,341	2,381	2,754	49,206	188,308
Vietnam	6	342	0	25	0	373
Other	266	10,452	15	534	3,309	14,576
<b>Total</b>	<b>23,540</b>	<b>591,678</b>	<b>5,251</b>	<b>19,135</b>	<b>69,762</b>	<b>709,365</b>

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in € m.	Own funds requirements						
	Relevant credit risk exposures - Credit risk	Relevant credit exposures – Market risk	Relevant credit exposures – Securitisation positions in the non-trading book	Total	Risk-weighted exposure amounts	Own fund requirements weights (%)	Countercyclical buffer rate (%)
Angola	32	0	0	33	408.71	0.00	0.00
Argentina	42	3	0	46	571.76	0.00	0.00
Australia	83	51	15	150	1,871.20	0.01	0.00
Austria	46	5	0	51	640.78	0.00	0.00
Belgium	35	10	0	45	567.50	0.00	0.00
Bermuda	31	0	1	31	391.01	0.00	0.00
Brazil	20	0	0	20	253.56	0.00	0.00
British Virgin Islands	56	0	0	57	709.69	0.00	0.00
Canada	75	0	2	78	969.76	0.00	0.00
Cayman Islands	227	25	9	260	3,251.51	0.02	0.00
China	234	80	0	314	3,921.06	0.02	0.00
Czech Republic	7	0	0	7	83.31	0.00	1.00
Denmark	39	4	0	43	531.84	0.00	0.00
Finland	21	0	0	21	266.74	0.00	0.00
France	183	104	27	314	3,925.33	0.02	0.00
Germany	5,942	117	41	6,100	76,255.60	0.36	0.00
Hong Kong	105	6	0	111	1,390.20	0.01	1.88
Iceland	2	4	0	6	69.54	0.00	1.25
India	364	50	0	415	5,181.93	0.02	0.00
Indonesia	75	15	0	89	1,114.91	0.01	0.00
Ireland	199	47	135	380	4,752.65	0.02	0.00
Israel	20	2	0	22	272.73	0.00	0.00
Italy (incl. San Marino)	1,000	40	20	1,060	13,247.73	0.06	0.00
Japan	77	0	1	78	975.80	0.00	0.00
Jersey	86	1	9	96	1,202.27	0.01	0.00
Lebanon	20	0	0	20	251.35	0.00	0.00
Lithuania	0	0	0	0	0.91	0.00	0.50
Luxembourg	559	32	18	609	7,608.16	0.04	0.00
Malaysia	28	23	0	51	641.39	0.00	0.00
Mauritius	39	0	0	39	491.70	0.00	0.00
Mexico	35	0	0	35	440.47	0.00	0.00
Netherlands	466	13	18	497	6,207.64	0.03	0.00
Norway	25	12	0	37	465.12	0.00	2.00
Pakistan	29	0	0	29	367.38	0.00	0.00
Philippines	27	2	0	29	356.65	0.00	0.00
Poland	94	0	0	94	1,176.51	0.01	0.00
Portugal	33	26	1	60	754.48	0.00	0.00
Russian Federation	28	0	0	28	344.74	0.00	0.00
Saudi Arabia	48	0	0	48	595.88	0.00	0.00
Singapore	137	6	0	143	1,791.77	0.01	0.00
Slovakia	2	1	0	2	31.23	0.00	1.25
South Africa	22	19	0	41	509.34	0.00	0.00
South Korea	64	39	0	103	1,289.31	0.01	0.00
Spain	641	4	12	658	8,222.13	0.04	0.00
Sweden	61	0	3	64	797.31	0.00	2.00
Switzerland	146	0	0	146	1,830.98	0.01	0.00
Taiwan	44	3	0	47	588.13	0.00	0.00
Thailand	25	13	0	38	471.37	0.00	0.00
Turkey	38	19	0	57	712.01	0.00	0.00
United Arab Emirates	32	0	0	32	395.82	0.00	0.00
United Kingdom	489	210	30	729	9,114.71	0.04	1.00
United States of America (incl. Puerto Rico)	2,521	341	367	3,228	40,354.54	0.19	0.00
Vietnam	31	1	0	32	403.82	0.00	0.00
Other	307	22	31	361	4,509.84	0.02	0.00
<b>Total</b>	<b>14,994</b>	<b>1,350</b>	<b>740</b>	<b>17,084</b>	<b>213,551.82</b>	<b>1.00</b>	<b>0.07</b>

## 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, 2019	Dec 31, 2018
Total risk exposure amount (in € m.)	324,015	350,432
Institution specific countercyclical buffer rate	0.08 %	0.07 %
Institution specific countercyclical buffer requirement (in € m.)	265	237

# 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).

### Article 442 (b) CRR - Credit risk adjustments

The determination of impairment losses and allowance is based on the 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 2019 on page 235 and 66.

## 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, 2019 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, 2019		Dec 31, 2018	
	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	118,380	122,333	118,444	118,105
2 Institutions	22,251	24,614	26,207	26,053
3 Corporates	408,300	399,152	381,377	375,678
of which:				
5 SMEs	22,881	20,302	16,661	17,569
4 Specialized lending	44,410	41,799	34,797	34,008
4a Other	341,009	337,051	329,918	324,101
6 Retail	222,813	220,709	218,063	219,459
of which:				
8 Secured by real estate property SMEs	9,103	9,221	9,433	9,737
9 Secured by real estate property non-SMEs	160,644	158,710	156,297	157,382
10 Qualifying revolving	15,971	16,182	16,466	16,662
12 Other retail SMEs	5,705	5,737	5,698	5,910
13 Other retail non-SMEs	31,390	30,860	30,169	29,768
14 Equity	2,163	2,136	2,137	1,788
14a Other non-credit obligation asset	9,429	9,684	6,893	6,792
<b>15 Total IRB approach</b>	<b>783,336</b>	<b>778,628</b>	<b>753,121</b>	<b>747,875</b>
16 Central governments or central banks	71,838	88,169	112,424	124,939
17 Regional governments or local authorities	8,047	8,831	10,085	10,541
18 Public sector entities	6,953	7,162	5,336	5,979
19 Multilateral development banks	3,738	3,941	3,344	3,936
20 International organizations	2,149	2,198	1,496	1,622
21 Institutions	2,648	2,588	1,412	1,474
22 Corporates	14,702	17,560	19,499	19,669
24 Retail	3,776	4,203	4,280	4,510
26 Secured by mortgages on immovable property	4,596	4,788	4,481	4,244
28 Exposures in default <sup>1</sup>	989	969	938	962
29 Items associated with particularly high risk	317	349	339	271
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	49	48	50	124
34 Other items	3	15	12	33
<b>35 Total standardized approach</b>	<b>118,816</b>	<b>139,852</b>	<b>162,758</b>	<b>177,343</b>
<b>36 Total</b>	<b>902,152</b>	<b>918,480</b>	<b>915,879</b>	<b>925,218</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

## 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, 2019						
		a	b	c	d	e	f	g
		Europe						
in € m.		Europe	Germany	United Kingdom	France	Luxembourg	Italy	Netherlands
1	Central governments and central banks	13,878	4,588	0	0	0	924	0
2	Institutions	8,648	1,613	1,128	1,294	325	91	378
3	Corporates	201,908	83,196	14,996	10,483	9,176	11,698	20,104
	of which:							
3a	SMEs	19,407	12,991	544	432	320	2,412	766
3b	Specialized lending	16,318	2,658	986	1,316	2,858	1,050	1,437
3c	Other	166,183	67,548	13,467	8,735	5,998	8,237	17,901
4	Retail	222,334	193,007	435	168	60	15,666	108
	of which:							
4a	Secured by real estate property SMEs	9,098	8,804	1	1	9	173	2
4b	Secured by real estate property non-SMEs	160,436	143,656	119	58	41	6,985	86
4c	Qualifying revolving	15,927	15,793	6	13	1	50	5
4d	Other retail SMEs	5,657	3,238	7	10	0	992	6
4e	Other retail non-SMEs	31,217	21,515	301	86	9	7,466	8
5	Equity	1,037	450	74	4	231	80	1
5a	Other non-credit obligation asset	6,943	6,158	43	4	177	189	33
6	<b>Total IRB approach</b>	<b>454,748</b>	<b>289,014</b>	<b>16,676</b>	<b>11,952</b>	<b>9,968</b>	<b>28,647</b>	<b>20,624</b>
7	Central governments or central banks	71,644	49,461	5,437	6,114	5,050	1,277	776
8	Regional governments or local authorities	8,038	7,865	0	0	0	0	0
9	Public sector entities	6,908	6,908	0	0	0	0	0
10	Multilateral development banks	588	0	0	257	331	0	0
11	International organizations	811	0	0	0	270	0	0
12	Institutions	2,607	886	1,147	3	536	9	0
13	Corporates	9,562	5,768	283	108	1,181	434	600
14	Retail	3,480	1,236	4	10	258	1,647	59
15	Secured by mortgages on immovable property	2,418	233	29	26	1,132	323	372
16	Exposures in default <sup>†</sup>	795	359	1	1	6	203	51
17	Items associated with particularly high risk	127	0	0	0	0	109	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	2	2	0	0	0	0	0
23	<b>Total standardized approach</b>	<b>106,192</b>	<b>72,365</b>	<b>6,900</b>	<b>6,518</b>	<b>8,759</b>	<b>3,800</b>	<b>1,806</b>
24	<b>Total</b>	<b>560,940</b>	<b>361,379</b>	<b>23,576</b>	<b>18,470</b>	<b>18,727</b>	<b>32,447</b>	<b>22,430</b>

		Dec 31, 2019						
		h	i	j	k	l	m	n
		Europe						North America
in € m.		Spain	Ireland	Switzerland	Poland	Belgium	Other Europe	
1	Central governments and central banks	435	0	3,871	2,099	73	1,887	78,706
2	Institutions	337	104	524	1	1,347	1,505	4,944
3	Corporates	11,002	5,324	16,336	1,017	2,638	15,939	150,309
	of which:							
3a	SMEs	1,214	23	88	31	93	494	1,939
3b	Specialized lending	984	1,858	67	180	290	2,636	23,812
3c	Other	8,804	3,443	16,181	806	2,254	12,809	124,558
4	Retail	10,131	24	247	2,188	47	255	94
	of which:							
4a	Secured by real estate property SMEs	99	0	5	1	0	4	1
4b	Secured by real estate property non-SMEs	6,947	21	185	2,162	30	145	59
4c	Qualifying revolving	6	0	19	3	5	25	8
4d	Other retail SMEs	1,364	1	6	6	3	22	20
4e	Other retail non-SMEs	1,715	1	32	16	8	58	6
5	Equity	9	0	59	0	16	114	840
5a	Other non-credit obligation asset	114	51	50	4	65	53	439
<b>6</b>	<b>Total IRB approach</b>	<b>22,027</b>	<b>5,503</b>	<b>21,088</b>	<b>5,309</b>	<b>4,187</b>	<b>19,753</b>	<b>235,333</b>
7	Central governments or central banks	1,698	0	0	20	647	1,164	0
8	Regional governments or local authorities	173	0	0	0	0	0	9
9	Public sector entities	0	0	0	0	0	0	45
10	Multilateral development banks	0	0	0	0	0	0	0
11	International organizations	0	0	0	0	541	0	0
12	Institutions	0	0	8	0	1	16	34
13	Corporates	82	386	22	25	159	514	2,483
14	Retail	62	0	5	0	194	4	4
15	Secured by mortgages on immovable property	236	7	2	0	55	3	83
16	Exposures in default <sup>†</sup>	5	138	3	2	4	22	84
17	Items associated with particularly high risk	7	0	0	0	0	11	186
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	43
22	Other items	0	0	0	0	0	0	1
<b>23</b>	<b>Total standardized approach</b>	<b>2,258</b>	<b>394</b>	<b>37</b>	<b>45</b>	<b>1,597</b>	<b>1,713</b>	<b>2,887</b>
<b>24</b>	<b>Total</b>	<b>24,285</b>	<b>5,897</b>	<b>21,125</b>	<b>5,354</b>	<b>5,784</b>	<b>21,466</b>	<b>238,220</b>

		Dec 31, 2019						
		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	78,680	0	17	9	22,827	8,562	718
2	Institutions	3,702	0	1,242	0	7,605	257	625
3	Corporates	135,899	2,858	2,943	8,610	48,521	1,826	3,078
	of which:							
3a	SMEs	1,920	0	1	17	1,291	11	61
3b	Specialized lending	23,142	1	109	560	3,498	533	946
3c	Other	110,837	2,857	2,832	8,032	43,732	1,282	2,071
4	Retail	85	0	8	1	260	7	12
	of which:							
4a	Secured by real estate property SMEs	1	0	0	0	4	0	1
4b	Secured by real estate property non-SMEs	55	0	4	0	126	5	7
4c	Qualifying revolving	7	0	1	0	23	1	1
4d	Other retail SMEs	18	0	2	0	14	1	1
4e	Other retail non-SMEs	4	0	1	1	93	0	2
5	Equity	735	106	0	0	89	7	3
5a	Other non-credit obligation asset	439	0	0	0	1,297	58	51
<b>6</b>	<b>Total IRB approach</b>	<b>219,540</b>	<b>2,964</b>	<b>4,210</b>	<b>8,619</b>	<b>80,599</b>	<b>10,717</b>	<b>4,487</b>
7	Central governments or central banks	0	0	0	0	113	0	0
8	Regional governments or local authorities	9	0	0	0	0	0	0
9	Public sector entities	45	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	34	0	0	0	7	0	0
13	Corporates	1,667	158	149	509	1,756	772	69
14	Retail	4	0	0	0	291	0	0
15	Secured by mortgages on immovable property	81	0	1	0	2,095	0	0
16	Exposures in default <sup>†</sup>	3	0	0	81	110	81	0
17	Items associated with particularly high risk	186	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	43	0	0	0	0	0	0
22	Other items	1	0	0	0	0	0	0
<b>23</b>	<b>Total standardized approach</b>	<b>2,070</b>	<b>158</b>	<b>150</b>	<b>509</b>	<b>4,266</b>	<b>772</b>	<b>69</b>
<b>24</b>	<b>Total</b>	<b>221,609</b>	<b>3,121</b>	<b>4,360</b>	<b>9,129</b>	<b>84,865</b>	<b>11,489</b>	<b>4,556</b>

		Dec 31, 2019						
		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	2,948	1,106	2,623	448	6,421	2,969	118,380
2	Institutions	1,357	2,297	195	560	2,314	1,054	22,251
3	Corporates	8,736	5,284	6,703	6,263	16,633	7,561	408,300
	of which:							
3a	SMEs	721	57	249	43	150	243	22,881
3b	Specialized lending	373	76	253	495	822	782	44,410
3c	Other	7,642	5,150	6,201	5,726	15,662	6,536	341,009
4	Retail	47	32	17	14	131	125	222,813
	of which:							
4a	Secured by real estate property SMEs	0	0	0	0	2	1	9,103
4b	Secured by real estate property non-SMEs	8	25	13	13	56	24	160,644
4c	Qualifying revolving	3	3	1	1	13	13	15,971
4d	Other retail SMEs	2	2	0	0	8	14	5,705
4e	Other retail non-SMEs	33	2	3	1	53	74	31,390
5	Equity	40	9	16	9	5	196	2,163
5a	Other non-credit obligation asset	95	603	171	176	143	749	9,429
6	<b>Total IRB approach</b>	<b>13,222</b>	<b>9,331</b>	<b>9,725</b>	<b>7,470</b>	<b>25,647</b>	<b>12,655</b>	<b>783,336</b>
7	Central governments or central banks	0	0	0	0	113	81	71,838
8	Regional governments or local authorities	0	0	0	0	0	0	8,047
9	Public sector entities	0	0	0	0	0	0	6,953
10	Multilateral development banks	0	0	0	0	0	3,149	3,738
11	International organizations	0	0	0	0	0	1,338	2,149
12	Institutions	1	3	0	1	2	0	2,648
13	Corporates	171	10	18	153	562	901	14,702
14	Retail	286	0	0	0	5	1	3,776
15	Secured by mortgages on immovable property	2,083	5	0	1	5	1	4,596
16	Exposures in default <sup>1</sup>	1	2	26	0	0	0	989
17	Items associated with particularly high risk	0	0	0	0	4	0	317
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	49
22	Other items	0	0	0	0	0	0	3
23	<b>Total standardized approach</b>	<b>2,541</b>	<b>19</b>	<b>19</b>	<b>155</b>	<b>690</b>	<b>5,471</b>	<b>118,816</b>
24	<b>Total</b>	<b>15,763</b>	<b>9,351</b>	<b>9,744</b>	<b>7,625</b>	<b>26,338</b>	<b>18,127</b>	<b>902,152</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

		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
<b>6</b>	<b>Total IRB approach</b>	<b>435,165</b>	<b>276,912</b>	<b>15,615</b>	<b>10,175</b>	<b>11,389</b>	<b>26,659</b>	<b>17,851</b>
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 <sup>†</sup>	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
<b>23</b>	<b>Total standardized approach</b>	<b>147,559</b>	<b>116,317</b>	<b>7,765</b>	<b>1,401</b>	<b>9,553</b>	<b>3,982</b>	<b>2,438</b>
<b>24</b>	<b>Total</b>	<b>582,725</b>	<b>393,228</b>	<b>23,380</b>	<b>11,576</b>	<b>20,942</b>	<b>30,640</b>	<b>20,289</b>

		Dec 31, 2018						
		h	i	j	k	l	m	n
		Europe						North America
in € m.		Spain	Ireland	Switzerland	Poland	Belgium	Other Europe	
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
<b>6</b>	<b>Total IRB approach</b>	<b>21,453</b>	<b>5,851</b>	<b>18,128</b>	<b>6,123</b>	<b>3,989</b>	<b>21,022</b>	<b>237,201</b>
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 <sup>1</sup>	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
<b>23</b>	<b>Total standardized approach</b>	<b>2,417</b>	<b>736</b>	<b>108</b>	<b>89</b>	<b>1,029</b>	<b>1,726</b>	<b>6,227</b>
<b>24</b>	<b>Total</b>	<b>23,869</b>	<b>6,587</b>	<b>18,235</b>	<b>6,212</b>	<b>5,018</b>	<b>22,748</b>	<b>243,428</b>

		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
<b>6</b>	<b>Total IRB approach</b>	<b>222,601</b>	<b>2,672</b>	<b>3,538</b>	<b>8,390</b>	<b>70,458</b>	<b>6,570</b>	<b>3,826</b>
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*	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
<b>23</b>	<b>Total standardized approach</b>	<b>4,783</b>	<b>519</b>	<b>158</b>	<b>766</b>	<b>4,071</b>	<b>758</b>	<b>154</b>
<b>24</b>	<b>Total</b>	<b>227,383</b>	<b>3,191</b>	<b>3,697</b>	<b>9,157</b>	<b>74,529</b>	<b>7,328</b>	<b>3,979</b>

		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	<b>Total IRB approach</b>	<b>11,894</b>	<b>8,311</b>	<b>10,261</b>	<b>6,353</b>	<b>23,243</b>	<b>10,297</b>	<b>753,121</b>
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 <sup>1</sup>	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	<b>Total standardized approach</b>	<b>2,397</b>	<b>18</b>	<b>51</b>	<b>281</b>	<b>413</b>	<b>4,900</b>	<b>162,758</b>
24	<b>Total<sup>1</sup></b>	<b>14,291</b>	<b>8,329</b>	<b>10,312</b>	<b>6,635</b>	<b>23,655</b>	<b>15,197</b>	<b>915,879</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

## 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, 2019						
		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	47	0
2	Institutions	0	0	0	7	107	0	48
3	Corporates	1,315	9,110	93,559	12,476	992	7,524	35,384
	of which:							
3a	SMEs	181	63	4,608	174	132	844	2,451
3b	Specialized lending	2	0	435	1,031	0	854	198
3c	Other	1,132	9,047	88,516	11,272	860	5,826	32,735
4	Retail	201	17	1,711	37	50	1,197	2,730
	of which:							
4a	Secured by real estate property SMEs	91	1	322	8	13	492	660
4b	Secured by real estate property non-SMEs	29	6	256	6	4	266	494
4c	Qualifying revolving	0	0	0	0	0	0	0
4d	Other retail SMEs	64	6	979	19	30	345	1,152
4e	Other retail non-SMEs	18	3	154	4	4	95	425
5	Equity	0	4	1	1	0	0	0
5a	Other non-credit obligation asset	0	0	0	0	0	0	0
6	Total IRB approach	1,516	9,131	95,271	12,521	1,149	8,768	38,163
7	Central governments or central banks	0	0	0	0	0	0	0
8	Regional governments or local authorities	0	0	0	0	185	0	0
9	Public sector entities	0	0	0	2	13	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	6	74	697	36	37	57	912
14	Retail	4	5	111	1	2	29	74
15	Secured by mortgages on immovable property	37	26	634	6	3	86	565
16	Exposures in default <sup>1</sup>	6	1	93	0	0	23	41
17	Items associated with particularly high risk	0	0	2	0	0	36	6
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	48	106	1,444	45	239	207	1,558
24	Total	1,564	9,237	96,716	12,565	1,388	8,975	39,720

		Dec 31, 2019							
		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	20	0	0	79,132	0	0	0	34,478
2	Institutions	49	0	9	20,991	124	206	0	650
3	Corporates	10,818	3,929	22,867	109,535	48,742	10,941	9,105	926
	of which:								
3a	SMEs	373	612	528	4,508	5,072	1,198	649	69
3b	Specialized lending	1,699	832	187	9,322	27,657	228	1,179	26
3c	Other	8,746	2,486	22,152	95,704	16,012	9,515	7,277	831
4	Retail	364	494	478	1,203	3,614	4,434	1,075	2
	of which:								
4a	Secured by real estate property SMEs	73	190	162	557	1,826	1,103	396	0
4b	Secured by real estate property non-SMEs	81	130	132	191	1,569	2,395	349	1
4c	Qualifying revolving	0	0	0	0	0	0	0	0
4d	Other retail SMEs	173	119	126	76	125	573	205	0
4e	Other retail non-SMEs	38	55	58	380	94	363	125	0
5	Equity	0	0	240	1,044	201	7	379	0
5a	Other non-credit obligation asset	0	0	0	2,326	0	1	2,953	0
6	Total IRB approach	11,252	4,424	23,594	214,230	52,681	15,590	13,511	36,056
7	Central governments or central banks	0	0	0	59,554	0	0	0	12,283
8	Regional governments or local authorities	0	0	0	0	9	0	0	7,820
9	Public sector entities	12	0	0	6,703	0	3	0	150
10	Multilateral development banks	0	0	0	0	0	0	0	0
11	International organizations	0	0	0	559	0	0	0	811
12	Institutions	0	0	0	2,648	0	0	0	0
13	Corporates	226	79	355	6,659	380	329	45	14
14	Retail	18	5	18	16	3	23	23	1
15	Secured by mortgages on immovable property	78	51	54	117	197	126	50	2
16	Exposures in default <sup>1</sup>	8	6	3	237	37	248	29	0
17	Items associated with particularly high risk	0	7	1	187	18	29	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	32	11	0	0	0
22	Other items	0	0	0	0	0	0	2	0
23	Total standardized approach	334	142	428	76,474	618	511	121	21,081
24	Total	11,586	4,566	24,022	290,705	53,299	16,101	13,632	57,137

		Dec 31, 2019						
		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	4,588	0	115	118,380
2	Institutions	1	23	0	35	0	0	22,251
3	Corporates	437	3,694	1,901	5,716	19,325	6	408,300
	of which:							
3a	SMEs	113	344	93	659	210	0	22,881
3b	Specialized lending	0	109	0	377	274	0	44,410
3c	Other	324	3,241	1,807	4,679	18,842	6	341,009
4	Retail	124	2,582	280	1,132	201,087	0	222,813
	of which:							
4a	Secured by real estate property SMEs	39	901	132	385	1,754	0	9,103
4b	Secured by real estate property non-SMEs	41	413	69	228	153,984	0	160,644
4c	Qualifying revolving	0	0	0	0	15,971	0	15,971
4d	Other retail SMEs	25	720	47	128	794	0	5,705
4e	Other retail non-SMEs	19	548	31	392	28,584	0	31,390
5	Equity	9	0	0	278	0	0	2,163
5a	Other non-credit obligation asset	0	0	0	4,148	0	0	9,429
6	<b>Total IRB approach</b>	<b>570</b>	<b>6,299</b>	<b>2,180</b>	<b>15,898</b>	<b>220,412</b>	<b>121</b>	<b>783,336</b>
7	Central governments or central banks	0	0	0	0	0	2	71,838
8	Regional governments or local authorities	0	5	1	18	9	0	8,047
9	Public sector entities	0	70	0	0	0	0	6,953
10	Multilateral development banks	0	0	0	0	0	3,738	3,738
11	International organizations	0	0	0	0	0	779	2,149
12	Institutions	0	0	0	0	0	0	2,648
13	Corporates	134	114	23	3,363	1,160	1	14,702
14	Retail	1	3	2	53	3,385	0	3,776
15	Secured by mortgages on immovable property	6	34	13	459	2,053	0	4,596
16	Exposures in default <sup>1</sup>	0	0	4	95	156	0	989
17	Items associated with particularly high risk	0	0	0	1	28	0	317
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	6	0	0	49
22	Other items	0	0	0	1	0	0	3
23	<b>Total standardized approach</b>	<b>141</b>	<b>226</b>	<b>39</b>	<b>3,900</b>	<b>6,635</b>	<b>4,519</b>	<b>118,816</b>
24	<b>Total</b>	<b>711</b>	<b>6,525</b>	<b>2,219</b>	<b>19,797</b>	<b>227,048</b>	<b>4,640</b>	<b>902,152</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

		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	<b>Total IRB approach</b>	<b>1,139</b>	<b>11,261</b>	<b>89,818</b>	<b>10,571</b>	<b>1,120</b>	<b>9,226</b>	<b>38,723</b>
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 <sup>1</sup>	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	<b>Total standardized approach</b>	<b>60</b>	<b>17</b>	<b>1,406</b>	<b>40</b>	<b>220</b>	<b>300</b>	<b>1,360</b>
24	<b>Total</b>	<b>1,199</b>	<b>11,278</b>	<b>91,224</b>	<b>10,611</b>	<b>1,340</b>	<b>9,525</b>	<b>40,084</b>

		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
15	Secured by mortgages on immovable property	60	42	41	229	309	112	31	0
16	Exposures in default <sup>1</sup>	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	<b>Total IRB approach</b>	<b>618</b>	<b>5,431</b>	<b>1,833</b>	<b>9,756</b>	<b>215,891</b>	<b>127</b>	<b>753,121</b>
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 <sup>1</sup>	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	<b>Total standardized approach</b>	<b>19</b>	<b>123</b>	<b>26</b>	<b>4,149</b>	<b>7,093</b>	<b>360</b>	<b>162,758</b>
24	<b>Total</b>	<b>637</b>	<b>5,553</b>	<b>1,859</b>	<b>13,904</b>	<b>222,984</b>	<b>487</b>	<b>915,879</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

## 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 development 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, 2019					
		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	64,594	21,449	21,136	3,779	1,759	117,307
2	Institutions	5,205	7,912	2,928	1,557	67	17,712
3	Corporates	17,282	80,307	72,096	33,023	3,814	207,176
	of which:						
3a	SMEs	1,936	3,432	3,771	6,349	20	15,507
3b	Specialized lending	1,980	8,378	19,946	9,529	0	39,895
3c	Other	13,367	68,497	48,379	17,146	3,794	151,775
4	Retail	2,364	4,866	18,823	164,110	2,342	192,500
	of which:						
4a	Secured by real estate property SMEs	95	139	815	7,532	0	8,581
4b	Secured by real estate property non-SMEs	254	1,737	8,201	140,412	1,458	152,062
4c	Qualifying revolving	902	46	0	0	0	948
4d	Other retail SMEs	631	1,074	1,156	614	339	3,813
4e	Other retail non-SMEs	482	1,869	8,651	15,552	545	27,096
5	Equity	239	1,310	26	538	0	2,127
5a	Other non-credit obligation asset	1,237	5,016	898	50	2,226	9,427
6	<b>Total IRB approach</b>	<b>90,922</b>	<b>120,860</b>	<b>115,905</b>	<b>203,057</b>	<b>10,209</b>	<b>546,251</b>
7	Central governments or central banks	36,568	23,042	3,710	6,404	1,917	71,640
8	Regional governments or local authorities	65	1,699	2,922	2,031	0	6,718
9	Public sector entities	56	449	2,956	3,476	1	6,938
10	Multilateral development banks	0	29	2,012	1,697	0	3,738
11	International organizations	0	587	743	819	0	2,149
12	Institutions	1,414	18	0	732	611	2,627
13	Corporates	1,137	6,123	3,438	1,413	229	12,419
14	Retail	757	237	656	817	41	2,502
15	Secured by mortgages on immovable property	495	500	421	2,961	1	4,395
16	Exposures in default <sup>1</sup>	385	76	389	394	0	978
17	Items associated with particularly high risk	23	3	194	84	0	304
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	49	0	49
22	Other items	0	3	0	0	0	3
23	<b>Total standardized approach</b>	<b>40,514</b>	<b>32,690</b>	<b>17,053</b>	<b>20,482</b>	<b>2,800</b>	<b>113,481</b>
24	<b>Total</b>	<b>131,436</b>	<b>153,549</b>	<b>132,958</b>	<b>223,539</b>	<b>13,009</b>	<b>659,732</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

		Dec 31, 2018					
		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	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
<b>6</b>	<b>Total IRB approach</b>	<b>66,087</b>	<b>145,559</b>	<b>92,156</b>	<b>206,075</b>	<b>8,174</b>	<b>518,050</b>
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 <sup>1</sup>	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
<b>23</b>	<b>Total standardized approach</b>	<b>3,812</b>	<b>115,147</b>	<b>20,246</b>	<b>15,091</b>	<b>2,789</b>	<b>157,084</b>
<b>24</b>	<b>Total</b>	<b>69,900</b>	<b>260,706</b>	<b>112,402</b>	<b>221,165</b>	<b>10,962</b>	<b>675,135</b>

<sup>1</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

## 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. 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, 2019						
								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, 2019 <sup>1</sup>	Net values (a+b-c-d)							
1	Central governments and central banks	44	118,351	16	0	0	118,380							
2	Institutions	20	22,246	15	0	0	22,251							
3	Corporates	6,485	403,612	1,797	0	392	408,300							
	Of which:													
5	SMEs	425	22,697	240	0	5	22,881							
4	Specialized Lending	1,122	43,457	169	0	121	44,410							
5a	Other	4,938	337,458	1,387	0	266	341,009							
6	Retail	3,737	221,210	2,134	0	1,004	222,813							
	Of which:													
8	Secured by real estate property SMEs	103	9,054	54	0	0	9,103							
9	Secured by real estate property Non-SMEs	1,730	159,494	580	0	341	160,644							
10	Qualifying Revolving	62	15,984	76	0	0	15,971							
12	Other SMEs	244	5,665	204	0	142	5,705							
13	Other Non-SMEs	1,598	31,012	1,220	0	521	31,390							
14	Equity	1	2,162	0	0	0	2,163							
14a	Other non-credit obligation asset	41	9,388	1	0	0	9,429							
15	<b>Total IRB approach</b>	<b>10,328</b>	<b>776,969</b>	<b>3,961</b>	<b>0</b>	<b>1,397</b>	<b>783,336</b>							
16	Central governments or central banks	0	71,840	2	0	0	71,838							
17	Regional governments or local authorities	0	8,049	2	0	0	8,047							
18	Public sector entities	0	6,953	0	0	0	6,953							
19	Multilateral Development Banks	0	3,738	0	0	0	3,738							
20	International Organizations	0	2,149	0	0	0	2,149							
21	Institutions	0	2,657	9	0	0	2,648							
22	Corporates	646	14,116	60	0	92	14,702							
24	Retail	341	3,696	261	0	65	3,776							
26	Secured by mortgages on immovable property	214	4,397	15	0	0	4,596							
28	Exposures in default <sup>2</sup>	1,392	0	403	0	158	989							
29	Items associated with particularly high risk	191	259	133	0	0	317							
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	49	0	0	0	49							
34	Other items	0	3	0	0	0	3							
35	<b>Total standardized approach</b>	<b>1,392</b>	<b>117,907</b>	<b>483</b>	<b>0</b>	<b>158</b>	<b>118,816</b>							
36	<b>Total</b>	<b>11,721</b>	<b>894,876</b>	<b>4,444</b>	<b>0</b>	<b>1,555</b>	<b>902,152</b>							
	Of which:													
37	Loans	9,949	416,216	4,051	0	1,555	422,115							
38	Debt Securities	252	69,868	17	0	0	70,104							
39	Off-balance sheet exposures	1,455	241,329	365	0	0	242,419							

<sup>1</sup> Credit risk adjustment charges of the period do not include recoveries.

<sup>2</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

							Jun 30, 2019						
							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, 2019 <sup>1</sup>	Net values (a+b-c-d)						
1	Central governments and central banks	69	127,831	16	0	0	127,885						
2	Institutions	19	24,680	16	0	4	24,683						
3	Corporates	5,610	386,174	1,738	0	153	390,046						
	Of which:												
5	SMEs	478	18,558	236	0	54	18,801						
4	Specialized Lending	1,517	40,511	237	0	10	41,791						
5a	Other	3,615	327,105	1,266	0	89	329,454						
6	Retail	3,522	217,642	2,140	0	156	219,024						
	Of which:												
8	Secured by real estate property SMEs	112	9,201	60	0	1	9,253						
9	Secured by real estate property Non-SMEs	1,604	156,420	569	0	1	157,455						
10	Qualifying Revolving	76	16,305	70	0	6	16,312						
12	Other SMEs	260	5,703	236	0	20	5,728						
13	Other Non-SMEs	1,470	30,012	1,205	0	129	30,277						
14	Equity	1	2,067	0	0	0	2,068						
14a	Other non-credit obligation asset	0	10,034	0	0	0	10,033						
15	<b>Total IRB approach</b>	<b>9,221</b>	<b>768,429</b>	<b>3,911</b>	<b>0</b>	<b>314</b>	<b>773,739</b>						
16	Central governments or central banks	1	83,150	2	0	0	83,149						
17	Regional governments or local authorities	0	8,310	2	0	0	8,308						
18	Public sector entities	0	7,089	0	0	0	7,088						
19	Multilateral Development Banks	0	4,155	0	0	0	4,154						
20	International Organizations	0	2,295	0	0	0	2,295						
21	Institutions	0	2,747	10	0	0	2,737						
22	Corporates	624	18,960	72	0	6	19,512						
24	Retail	360	4,881	277	0	15	4,964						
26	Secured by mortgages on immovable property	208	4,502	15	0	0	4,694						
28	Exposures in default <sup>2</sup>	1,402	0	429	0	19	973						
29	Items associated with particularly high risk	208	316	141	0	1	382						
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	52	0	0	0	52						
34	Other items	0	8	0	0	0	8						
35	<b>Total standardized approach</b>	<b>1,402</b>	<b>136,464</b>	<b>522</b>	<b>0</b>	<b>22</b>	<b>137,344</b>						
36	<b>Total</b>	<b>10,622</b>	<b>904,893</b>	<b>4,433</b>	<b>0</b>	<b>336</b>	<b>911,082</b>						
	Of which:												
37	Loans	9,649	399,837	4,029	0	316	405,457						
38	Debt Securities	180	70,250	21	0	5	70,410						
39	Off-balance sheet exposures	701	234,764	302	0	12	235,164						

<sup>1</sup> Credit risk adjustment charges of the period do not include recoveries.

<sup>2</sup> In light of EBA guidance (Q&A 2017\_3481) we present the defaulted exposure within the standardized approach as a total in row 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.

EU CR1-B – Credit quality of exposures by industry

		Dec 31, 2019						
		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, 2019 <sup>1</sup>	Net values (a+b-c-d)
1	Agriculture, forestry and fishing	44	1,533	13	0	3	2	1,564
2	Mining and quarrying	181	9,087	31	0	0	5	9,237
3	Manufacturing	1,786	95,598	668	0	167	89	96,716
4	Electricity, gas, steam and air conditioning supply	110	12,473	18	0	3	1	12,565
5	Water supply, sewerage, waste management and remediation activities	82	1,318	11	0	3	3	1,388
6	Construction	655	8,579	259	0	46	11	8,975
7	Wholesale and retail trade, repair of motor vehicles and motorcycles	754	39,414	448	0	174	23	39,720
8	Transport and storage	326	11,343	84	0	154	2	11,586
9	Accommodation and food service activities	104	4,487	25	0	3	2	4,566
10	Information and communication	153	23,948	78	0	12	16	24,022
10a	Financial and insurance activities	1,829	289,264	388	0	26	51	290,705
11	Real estate activities	685	52,777	163	0	147	5	53,299
12	Professional, scientific and technical activities	502	15,727	128	0	32	17	16,101
13	Administrative and support service activities	292	13,413	73	0	16	21	13,632
14	Public administration and defense, compulsory social security	46	57,108	17	0	0	3	57,137
15	Education	3	710	2	0	5	1	711
16	Human health services and social work activities	50	6,504	28	0	1	5	6,525
17	Arts, entertainment and recreation	10	2,219	10	0	2	(1)	2,219
18	Other service activities	161	19,675	38	0	7	(14)	19,797
18a	Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	3,948	225,061	1,961	0	755	171	227,048
18b	Activities of extraterritorial organizations and bodies	1	4,640	1	0	0	0	4,640
<b>19</b>	<b>Total</b>	<b>11,721</b>	<b>894,876</b>	<b>4,444</b>	<b>0</b>	<b>1,555</b>	<b>413</b>	<b>902,152</b>

<sup>1</sup> Credit risk adjustment charges of the period do not include recoveries.

		Jun 30, 2019						
		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, 2019 <sup>1</sup>	Net values (a+b-c-d)
1	Agriculture, forestry and fishing	51	1,391	12	0	2	(1)	1,430
2	Mining and quarrying	203	9,426	26	0	0	4	9,603
3	Manufacturing	1,284	90,506	617	0	83	65	91,173
4	Electricity, gas, steam and air conditioning supply	101	11,111	22	0	1	4	11,189
5	Water supply, sewerage, waste management and remediation activities	11	1,348	8	0	0	1	1,351
6	Construction	571	9,141	268	0	35	8	9,444
7	Wholesale and retail trade, repair of motor vehicles and motorcycles	692	39,166	456	0	129	66	39,402
8	Transport and storage	460	11,258	157	0	122	2	11,561
9	Accommodation and food service activities	118	4,084	26	0	0	1	4,176
10	Information and communication	218	23,828	77	0	6	8	23,969
10a	Financial and insurance activities	1,059	314,939	396	0	13	(1)	315,603
11	Real estate activities	880	48,271	174	0	15	3	48,976
12	Professional, scientific and technical activities	560	14,885	127	0	17	16	15,317
13	Administrative and support service activities	252	12,456	43	0	10	9	12,665
14	Public administration and defense, compulsory social security	70	54,836	18	0	0	(1)	54,887
15	Education	3	748	3	0	3	0	748
16	Human health services and social work activities	17	6,053	24	0	0	3	6,046
17	Arts, entertainment and recreation	8	1,994	11	0	1	2	1,991
18	Other service activities	139	22,363	42	0	11	22	22,460
18a	Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use	3,924	222,737	1,924	0	586	126	224,737
18b	Activities of extraterritorial organizations and bodies	1	4,352	1	0	0	0	4,352
<b>19</b>	<b>Total</b>	<b>10,622</b>	<b>904,893</b>	<b>4,433</b>	<b>0</b>	<b>1,033</b>	<b>336</b>	<b>911,082</b>

<sup>1</sup> Credit risk adjustment charges of the period do not include recoveries.

## Article 442 (h) CRR - Defaulted exposures by geographical area, past due, nonperforming 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. 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, 2019						
		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 ended six months ended Dec 31, 2019 <sup>1</sup>	Net values (a+b-c-d)
1	Europe	9,387	555,420	3,867	0	1,367	365	560,940
	Of which:							
2	Germany	3,965	359,402	1,989	0	468	221	361,379
3	United Kingdom	379	23,259	62	0	45	(4)	23,576
4	France	23	18,471	23	0	0	4	18,470
5	Luxembourg	192	18,563	28	0	24	6	18,727
6	Italy	1,472	32,015	1,041	0	311	63	32,447
7	Netherlands	610	22,051	231	0	25	24	22,430
8	Spain	1,029	23,591	335	0	417	46	24,285
9	Ireland	982	4,940	25	0	(9)	5	5,897
10	Switzerland	395	20,758	29	0	1	2	21,125
11	Poland	74	5,320	40	0	0	1	5,354
12	Belgium	6	5,781	3	0	0	0	5,784
13	Other Europe	260	21,269	63	0	83	(2)	21,466
14	North America	1,160	237,320	260	0	78	18	238,220
	Of which:							
15	U.S.	563	221,281	235	0	72	15	221,609
16	Cayman Islands	149	2,975	4	0	0	0	3,121
17	Canada	14	4,352	6	0	5	1	4,360
18	Other North America	434	8,711	16	0	0	2	9,129
19	Asia/Pacific	903	84,225	263	0	54	48	84,865
	Of which:							
20	Japan	96	11,390	(3)	0	(3)	(1)	11,489
21	Australia	50	4,515	9	0	0	0	4,556
22	India	341	15,551	128	0	11	18	15,763
23	China	9	9,346	4	0	0	(10)	9,351
24	Singapore	31	9,725	11	0	0	1	9,744
25	Hong Kong	139	7,532	46	0	0	32	7,625
26	Other Asia/Pacific	237	26,169	67	0	45	6	26,338
27	Other geographical areas	271	17,910	54	0	57	(18)	18,127
<b>28</b>	<b>Total</b>	<b>11,721</b>	<b>894,876</b>	<b>4,444</b>	<b>0</b>	<b>1,555</b>	<b>413</b>	<b>902,152</b>

<sup>1</sup> Credit risk adjustment charges of the period do not include recoveries.

		Jun 30, 2019						
		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, 2019 <sup>1</sup>	Net values (a+b-c-d)
1	Europe	8,698	560,387	3,878	0	861	225	565,207
	Of which:							
2	Germany	3,755	372,711	1,875	0	424	90	374,590
3	United Kingdom	354	23,935	54	0	9	13	24,235
4	France	28	11,455	20	0	1	4	11,463
5	Luxembourg	66	20,617	23	0	0	5	20,660
6	Italy	1,538	30,369	1,108	0	122	67	30,798
7	Netherlands	465	20,640	216	0	48	4	20,890
8	Spain	951	23,652	401	0	203	23	24,202
9	Ireland	648	5,478	38	0	(2)	3	6,088
10	Switzerland	509	19,591	27	0	1	1	20,074
11	Poland	75	5,400	39	0	3	1	5,435
12	Belgium	7	6,355	4	0	1	0	6,358
13	Other Europe	302	20,184	72	0	51	14	20,414
14	North America	935	240,883	263	0	45	45	241,556
	Of which:							
15	U.S.	529	224,061	232	0	45	42	224,358
16	Cayman Islands	158	3,595	8	0	0	1	3,745
17	Canada	23	4,133	9	0	0	2	4,147
18	Other North America	226	9,096	15	0	0	1	9,306
19	Asia/Pacific	796	85,338	229	0	44	24	85,905
	Of which:							
20	Japan	89	13,042	(3)	0	(2)	(1)	13,134
21	Australia	68	4,357	9	0	0	1	4,415
22	India	423	16,021	119	0	4	10	16,326
23	China	1	8,594	3	0	28	11	8,591
24	Singapore	27	9,660	10	0	0	1	9,676
25	Hong Kong	91	8,491	5	0	0	1	8,577
26	Other Asia/Pacific	96	25,174	85	0	14	2	25,185
27	Other geographical areas	194	18,285	63	0	83	43	18,415
28	<b>Total</b>	<b>10,622</b>	<b>904,893</b>	<b>4,433</b>	<b>0</b>	<b>1,033</b>	<b>336</b>	<b>911,082</b>

<sup>1</sup> 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, 2019			Jun 30, 2019			
	1	2	3	1	2	3	
	Loans	Debt Securities	Total exposures	Loans	Debt Securities	Total exposures	
a	≤ 30 days	2,810	0	2,810	2,952	0	2,952
b	> 30 days ≤ 60 days	475	24	499	575	0	575
c	> 60 days ≤ 90 days	281	0	281	318	0	318
d	> 90 days ≤ 180 days	989	0	989	1,035	0	1,035
e	> 180 days ≤ 1 year	697	0	697	677	0	677
f	> 1 year	2,009	0	2,009	2,210	1	2,211

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 2019 on page 133.

## EU CR1-E – Non-performing and forborne exposures

in € m.	Dec 31, 2019						Jun 30, 2019								
	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	<b>Gross carrying amount of performing and non-performing exposures</b>									72,503	747,434	259,148	69,558	806,302	254,258
	of which:														
b	Performing but past due >30 days and <=90 days									24	524	0	0	648	0
c	Performing forborne									0	1,729	232	0	2,052	189
d	Non-performing:									160	9,916	1,473	182	10,018	760
	of which:														
e	Defaulted									160	9,757	1,469	182	9,794	759
f	Impaired									123	9,607	1,469	141	9,582	730
g	Forborne									48	3,069	151	10	3,151	123
	<b>Accumulated impairment and provisions and negative fair value adjustments due to credit risk</b>														
h	On performing exposures									16	1,050	185	19	1,088	208
i	of which: Forborne									0	47	2	0	61	2
j	On non-performing exposures									1	3,022	175	2	3,029	89
k	of which: Forborne									0	916	13	0	935	6
	<b>Collaterals and financial guarantees received</b>														
l	On non-performing exposures									0	3,661	130	0	3,753	95
m	of which: Forborne exposures									0	2,126	93	0	2,117	38

The following tables (NPL1, 3, 4 and 9) are of the EBA guidelines on disclosures of non-performing and forborne exposures (EBA/GL/2018/10) published on December 17, 2018. These are also meant to address "Key disclosure recommendations" related to non-performing loans ("NPLs") as provided by ECB guidance on NPLs (Appendix 7) issued in March 2017. Table NPL1 shows credit quality of forborne exposures broken down on type of counterparties. The exposure is further split between "Performing", "Non-performing", "Defaulted" and "Impaired" exposures with the provisions, collateral and guarantees against them. Table NPL4 shows performing and non-performing exposures and its related provisions. In addition, the exposure is split between IFRS 9 stages and type of counterparties. Table NPL3 shows credit quality of performing and non-performing exposures by buckets of past due days. Overdue refers to the unpaid contractual agreed payments of principal or interest by the borrower. In general, exposures refers to an asset or an off-balance sheet item which gives rise to credit risk and amounts shown are based on IFRS accounting according to the regulatory scope of consolidation. Table NPL9 provides information on the instruments that were cancelled in exchange for the collateral obtained by taking possession and on the value of the collateral obtained by taking possession. The split provides details on the accumulated "Value at initial recognition" and "Accumulated negative changes" of the collateral obtained.

## NPL1 – Credit quality of forborne exposures

in € m.	Dec 31, 2019							
	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	Total	of which, non-performing exposures with forbearance measures
Loans and advances	1,729	3,069	2,979	2,979	47	916	2,126	1,196
Central banks	0	0	0	0	0	0	0	0
General governments	0	5	5	5	0	2	0	0
Credit institutions	0	0	0	0	0	0	0	0
Other financial corporations	54	39	37	37	0	10	78	25
Non-financial corporations	876	1,918	1,894	1,894	14	621	1,219	624
Households	799	1,107	1,043	1,043	33	282	829	547
Debt securities	0	48	48	38	0	0	0	0
Loan commitments given	232	151	149	149	2	13	93	11
<b>Total</b>	<b>1,960</b>	<b>3,268</b>	<b>3,176</b>	<b>3,166</b>	<b>49</b>	<b>928</b>	<b>2,219</b>	<b>1,207</b>

								Jun 30, 2019
Gross carrying amount of forbore exposures					Accumulated impairment, accumulated negative changes in fair value due to credit risk and provisions		Collateral received and financial guarantees received on forbore exposures	
in € m.	Performing forbore	Non-performing forbore	Non-performing forbore, of which defaulted	Non-performing forbore, of which impaired	on performing forbore exposures	on non-performing forbore exposures		
Loans and advances	2,052	3,151	3,058	3,058	61	935	2,117	
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	102	51	50	50	1	34	69	
Non-financial corporations	1,033	1,987	1,967	1,967	19	652	1,243	
Households	915	1,107	1,037	1,037	40	246	805	
Debt securities	0	10	10	0	0	0	0	
Loan commitments given	189	123	123	0	2	6	38	
<b>Total</b>	<b>2,240</b>	<b>3,284</b>	<b>3,191</b>	<b>3,058</b>	<b>62</b>	<b>941</b>	<b>2,155</b>	

NPL9 – Collateral obtained by taking possession and execution processes

		Dec 31, 2019	
		a	b
		Collateral obtained by taking possession	
in € m.		Value at initial recognition	Accumulated negative changes
<b>1</b>	Property, plant and equipment (PP&E)	<b>0</b>	<b>0</b>
<b>2</b>	Other than PP&E	<b>54</b>	<b>0</b>
<b>3</b>	Residential immovable property	46	0
<b>4</b>	Commercial immovable property	8	0
<b>5</b>	Movable property (auto, shipping, etc.)	0	0
<b>6</b>	Equity and debt instruments	0	0
<b>7</b>	Other	0	0
<b>8</b>	<b>Total</b>	<b>54</b>	<b>0</b>



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

Dec 31, 2019

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 <=2yrs	Past due >2 and <=5 yrs	Past due >5 and <=7yrs	Past due >7 years	of which defaulted	of which impaired
<b>Loans and advances</b>													
Central banks	139,184	139,184	0	0	0	0	0	0	0	0	0	0	0
General governments	13,026	13,026	0	46	42	2	0	0	0	0	1	44	44
Credit institutions	53,220	53,220	0	4	4	0	0	0	0	0	0	4	4
Other financial corporations	162,357	162,352	5	1,253	1,238	3	0	6	2	1	2	1,239	1,125
Non-financial corporations	173,121	172,991	130	4,686	2,994	546	227	165	321	166	266	4,609	4,581
Households	196,610	196,221	389	3,928	1,999	369	418	348	450	113	231	3,862	3,853
<b>Total Loans and advances</b>	<b>737,518</b>	<b>736,994</b>	<b>524</b>	<b>9,916</b>	<b>6,278</b>	<b>920</b>	<b>645</b>	<b>520</b>	<b>773</b>	<b>281</b>	<b>499</b>	<b>9,757</b>	<b>9,607</b>
<b>Debt securities</b>													
Central banks	1,284	1,284	0	0	0	0	0	0	0	0	0	0	0
General governments	44,809	44,809	0	0	0	0	0	0	0	0	0	0	0
Credit institutions	14,137	14,137	0	0	0	0	0	0	0	0	0	0	0
Other financial corporations	6,595	6,595	0	75	75	0	0	0	0	0	0	75	75
Non-financial corporations	5,518	5,494	24	85	85	0	0	0	0	0	0	85	48
<b>Total Debt securities</b>	<b>72,343</b>	<b>72,319</b>	<b>24</b>	<b>160</b>	<b>160</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>160</b>	<b>123</b>
<b>Off-balance sheet exposures</b>													
Central banks	145	0	0	0	0	0	0	0	0	0	0	0	0
General governments	2,878	0	0	0	0	0	0	0	0	0	0	0	0
Credit institutions	4,898	0	0	0	0	0	0	0	0	0	0	0	0
Other financial corporations	41,419	0	0	1	0	0	0	0	0	0	0	1	1
Non-financial corporations	177,974	0	0	1,434	0	0	0	0	0	0	0	1,430	1,430
Households	30,361	0	0	38	0	0	0	0	0	0	0	38	38
<b>Total Off-balance sheet exposures</b>	<b>257,675</b>	<b>0</b>	<b>0</b>	<b>1,473</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,469</b>	<b>1,469</b>
<b>Total</b>	<b>1,067,536</b>	<b>809,313</b>	<b>548</b>	<b>11,549</b>	<b>6,438</b>	<b>920</b>	<b>645</b>	<b>520</b>	<b>773</b>	<b>281</b>	<b>499</b>	<b>11,387</b>	<b>11,199</b>

Jun 30, 2019

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
<b>Loans and advances</b>											
Central banks	161,092	161,092	0	0	0	0	0	0	0	0	0
General governments	18,192	18,192	0	69	68	0	0	0	1	69	69
Credit institutions	66,238	66,193	45	4	4	0	0	0	0	4	4
Other financial corporations	185,851	185,833	18	1,194	1,038	36	70	46	4	1,184	1,077
Non-financial corporations	172,996	172,798	199	4,797	3,045	589	157	559	446	4,662	4,653
Households	191,915	191,529	387	3,954	2,017	348	447	778	364	3,875	3,779
<b>Total Loans and advances</b>	<b>796,284</b>	<b>795,636</b>	<b>648</b>	<b>10,018</b>	<b>6,172</b>	<b>973</b>	<b>675</b>	<b>1,383</b>	<b>815</b>	<b>9,794</b>	<b>9,582</b>
<b>Debt securities</b>											
Central banks	1,354	1,354	0	0	0	0	0	0	0	0	0
General governments	42,205	42,205	0	0	0	0	0	0	0	0	0
Credit institutions	14,965	14,965	0	0	0	0	0	0	0	0	0
Other financial corporations	4,113	4,113	0	93	93	0	0	0	0	93	92
Non-financial corporations	6,739	6,739	0	88	88	0	0	0	0	88	50
<b>Total Debt securities</b>	<b>69,376</b>	<b>69,376</b>	<b>0</b>	<b>182</b>	<b>182</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>182</b>	<b>142</b>
<b>Off-balance sheet exposures</b>											
Central banks	175	0	0	0	0	0	0	0	0	0	0
General governments	1,238	0	0	0	0	0	0	0	0	0	0
Credit institutions	6,283	0	0	4	0	0	0	0	0	4	4
Other financial corporations	44,831	0	0	15	0	0	0	0	0	15	15
Non-financial corporations	170,267	0	0	700	0	0	0	0	0	700	670
Households	30,704	0	0	42	0	0	0	0	0	41	41
<b>Total Off-balance sheet exposures</b>	<b>253,498</b>	<b>0</b>	<b>0</b>	<b>760</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>759</b>	<b>730</b>
<b>Total</b>	<b>1,119,158</b>	<b>865,012</b>	<b>648</b>	<b>10,960</b>	<b>6,354</b>	<b>973</b>	<b>675</b>	<b>1,383</b>	<b>815</b>	<b>10,735</b>	<b>10,453</b>

NPL4 - Performing and non-performing exposures and related provisions

Dec 31, 2019

in € m.	Gross carrying amount/nominal amount						Accumulated impairment, accumulated negative changes in fair value due to credit risk and provisions						Accumulated partial write-off	Collaterals and financial guarantees received on	
	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				performing exposures	non-performing exposures
	Total	of which: stage 1	of which: stage 2	Total	of which: stage 2	of which: stage 3	Total	of which: stage 1	of which: stage 2	Total	of which: stage 2	of which: stage 3			
<b>Loans and advances</b>															
Central banks	139,184	138,957	227	0	0	0	4	2	2	0	0	0	0	38	0
General governments	13,026	12,288	738	46	2	44	7	3	4	5	0	5	0	1,713	34
Credit institutions	53,220	52,269	951	4	0	4	20	14	6	0	0	0	0	100	0
Other financial corporations	162,357	160,568	1,789	1,253	128	1,125	56	49	7	143	18	125	4	3,072	49
Non-financial corporations	173,121	164,753	8,368	4,686	104	4,581	346	199	147	1,583	5	1,578	182	34,554	1,538
of which: SMEs	24,782	23,002	1,780	956	8	948	61	27	34	512	0	0	0	4,461	331
Households	196,610	183,867	12,743	3,928	75	3,853	617	290	326	1,313	3	1,310	16	78,665	2,039
<b>Total Loans and advances</b>	<b>737,518</b>	<b>712,702</b>	<b>24,817</b>	<b>9,916</b>	<b>309</b>	<b>9,607</b>	<b>1,050</b>	<b>557</b>	<b>493</b>	<b>3,044</b>	<b>26</b>	<b>3,018</b>	<b>201</b>	<b>118,143</b>	<b>3,661</b>
<b>Debt securities</b>															
Central banks	1,284	1,263	20	0	0	0	0	0	0	0	0	0	0	0	0
General governments	44,809	44,714	96	0	0	0	4	4	0	0	0	0	0	0	0
Credit institutions	14,137	14,135	2	0	0	0	1	1	0	0	0	0	0	0	0
Other financial corporations	6,595	6,593	2	75	0	75	5	5	0	0	0	0	0	0	0
Non-financial corporations	5,518	5,108	410	85	37	48	5	4	0	1	0	1	0	0	0
<b>Total Debt securities</b>	<b>72,343</b>	<b>71,813</b>	<b>530</b>	<b>160</b>	<b>37</b>	<b>123</b>	<b>16</b>	<b>16</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Off-balance sheet exposures</b>															
Central banks	145	145	0	0	0	0	0	0	0	0	0	0	0	18	0
General governments	2,878	2,800	78	0	0	0	1	1	0	0	0	0	0	67	0
Credit institutions	4,898	4,672	226	0	0	0	4	1	3	0	0	0	0	182	0
Other financial corporations	41,419	41,124	295	1	0	1	15	14	1	10	0	10	0	1,042	0
Non-financial corporations	177,974	173,374	4,600	1,434	4	1,430	150	107	43	151	0	151	0	10,844	128
Households	30,361	29,471	890	38	0	38	16	8	8	13	0	13	0	38	2
<b>Total Off-balance sheet exposures</b>	<b>257,675</b>	<b>251,587</b>	<b>6,088</b>	<b>1,473</b>	<b>4</b>	<b>1,469</b>	<b>185</b>	<b>130</b>	<b>55</b>	<b>175</b>	<b>0</b>	<b>175</b>	<b>0</b>	<b>12,191</b>	<b>130</b>
<b>Total</b>	<b>1,067,536</b>	<b>1,036,102</b>	<b>31,435</b>	<b>11,549</b>	<b>350</b>	<b>11,199</b>	<b>1,251</b>	<b>703</b>	<b>548</b>	<b>3,220</b>	<b>26</b>	<b>3,194</b>	<b>201</b>	<b>130,334</b>	<b>3,791</b>

Jun 30, 2019

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	
<b>Loans and advances</b>										
Central banks	161,092	0	0	0	2	0	0	0	0	0
General governments	18,192	69	0	69	9	4	0	4	0	48
Credit institutions	66,238	4	0	4	22	0	0	0	0	0
Other financial corporations	185,851	1,194	117	1,077	55	122	0	121	7	37
Non-financial corporations	172,996	4,797	144	4,653	349	1,662	1	1,661	157	1,548
of which: SMEs	22,078	1,194	10	1,184	59	610	0	0	0	474
Households	191,915	3,954	175	3,779	652	1,242	5	1,237	29	2,120
<b>Total Loans and advances</b>	<b>796,284</b>	<b>10,018</b>	<b>436</b>	<b>9,582</b>	<b>1,088</b>	<b>3,029</b>	<b>6</b>	<b>3,023</b>	<b>193</b>	<b>3,753</b>
<b>Debt securities</b>										
Central banks	1,354	0	0	0	0	0	0	0	0	0
General governments	42,205	0	0	0	4	0	0	0	0	0
Credit institutions	14,965	0	0	0	1	0	0	0	0	0
Other financial corporations	4,113	93	2	92	7	0	0	0	0	0
Non-financial corporations	6,739	88	39	50	5	2	0	2	0	0
<b>Total Debt securities</b>	<b>69,376</b>	<b>182</b>	<b>40</b>	<b>142</b>	<b>19</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>Off-balance sheet exposures</b>										
Central banks	175	0	0	0	0	0	0	0	0	0
General governments	1,238	0	0	0	1	0	0	0	0	0
Credit institutions	6,283	4	0	4	4	0	0	0	0	0
Other financial corporations	44,831	15	0	15	24	0	0	0	0	0
Non-financial corporations	170,267	700	30	670	160	79	1	79	0	75
Households	30,704	42	1	41	18	9	(0)	9	0	20
<b>Total Off-balance sheet exposures</b>	<b>253,498</b>	<b>760</b>	<b>30</b>	<b>730</b>	<b>208</b>	<b>89</b>	<b>1</b>	<b>88</b>	<b>0</b>	<b>95</b>
<b>Total</b>	<b>1,119,158</b>	<b>10,960</b>	<b>507</b>	<b>10,453</b>	<b>1,315</b>	<b>3,119</b>	<b>6</b>	<b>3,113</b>	<b>193</b>	<b>3,848</b>

## 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 second half of 2019 compared to the first half of 2019. 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, 2019		Jun 30, 2019	
	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	3,025	0	3,250	0
2 Increases due to amounts set aside for estimated loan losses during the period	1,334	0	816	0
3 Decreases due to amounts reversed for estimated loan losses during the period	(886)	0	(589)	0
4 Decreases due to amounts taken against accumulated credit risk adjustments	(435)	0	(463)	0
5 Transfers between credit risk adjustments	(40)	0	5	0
6 Impact of exchange rate differences	10	0	4	0
7 Business combinations, including acquisitions and disposals of subsidiaries	0	0	0	0
8 Other adjustments	12	0	2	0
9 Closing balance	3,019	0	3,025	0
10 Recoveries on credit risk adjustments recorded directly to the statement of profit or loss	(89)	0	(41)	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 remained roughly stable.

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 2019 compared to the first half of 2019. 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, 2019	Jun 30, 2019
	a	a
	Gross carrying value defaulted exposures	Gross carrying value defaulted exposures
1 Opening balance	10,300	9,240
2 Loans and debt securities that have defaulted or impaired since the last reporting period	2,243	2,186
3 Returned to non-defaulted status	(1,947)	(1,148)
4 Amounts written off	(435)	(463)
5 Other changes	40	484
6 Closing balance	10,202	10,300

<sup>1</sup> Positions Other Changes and Closing Balance were restated for June 30, 2019 by addition of € 471 million, due to an improvement in identification of credit risk framework

Defaulted or impaired loans and debt securities subject to the credit risk framework slightly decreased by € 99 million, or 1 %.

For IFRS-based asset quality information please refer to the section "Asset quality" in our Annual Report 2019 on page 133.

## 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 2019 section "Managing and mitigation of credit risk" on page 73.

### Article 453 (b) CRR - Collateral evaluation and management

Please refer to the Annual Report 2019 section "Managing and mitigation of credit risk" on page 73.

## Article 453 (c) CRR - Main types of collateral

Please refer to the Annual Report 2019 section "Managing and mitigation of credit risk" on page 73.

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

Please refer to the Annual Report 2019 section "Managing and mitigation of credit risk" on page 73.

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

Please refer to the Annual Report 2019 section "Managing and mitigation of credit risk" subsection "Concentrations within credit risk mitigation" on page 77.

# 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 primarily observed of the secured exposures. Moreover, no overcollateralization is considered.

### EU CR3 – CRM techniques – Overview

		Dec 31, 2019				
		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
in € m.						
1	Total Loans	125,669	296,445	246,836	29,371	947
2	Total Debt securities	69,648	456	446	0	0
<b>3</b>	<b>Total exposures</b>	<b>195,318</b>	<b>296,901</b>	<b>247,283</b>	<b>29,371</b>	<b>947</b>
4	of which: defaulted	3,517	3,666	3,186	239	0

...

		Jun 30, 2019				
		a	b	c	d	e
		Exposures unsecured: Carrying amount <sup>1</sup>	Exposures secured: Carrying amount	Exposures secured by collateral	Exposures secured by financial guarantees	Exposures secured by credit derivatives
in € m.						
1	Total Loans	131,599	274,329	236,143	16,564	761
2	Total Debt securities	69,673	737	314	416	0
<b>3</b>	<b>Total exposures</b>	<b>201,272</b>	<b>275,066</b>	<b>236,457</b>	<b>16,979</b>	<b>761</b>
4	of which: defaulted	3,262	4,013	3,342	230	0

<sup>1</sup> Positions Total Loans, Total exposure and of which defaulted under Exposures unsecured Carrying amount have been restated.

Total exposure as per year end 2019 increased in comparison to June 2019, mainly in loans at amortized cost. This was mainly attributable to new deals and increased drawdowns from existing facilities. A slight decrease in debt securities was observed during the period.

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 developments 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, 2019				
	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
<b>Advanced IRBA</b>					
Central governments and central banks	115,492	2,887	165	2,216	0
Institutions	20,673	1,578	1,011	303	34
Corporates	244,354	156,665	97,539	31,963	0
of which:					
SMEs	11,620	11,165	6,507	2,255	0
Specialized lending	7,211	35,939	31,690	1,075	0
Other	225,522	109,560	59,343	28,633	0
Retail	64,993	157,820	142,562	2,253	0
of which:					
Secured by real estate property SMEs	899	8,205	6,829	170	0
Secured by real estate property non-SMEs	16,216	144,428	133,356	579	0
Qualifying revolving	15,922	49	25	1	0
Other retail SMEs	3,573	2,132	420	1,224	0
Other retail non-SMEs	28,384	3,006	1,932	279	0
Equity	2,163	0	0	0	0
Other non-credit obligation asset	9,429	0	0	0	0
<b>Total advanced IRBA</b>	<b>457,103</b>	<b>318,950</b>	<b>241,278</b>	<b>36,734</b>	<b>34</b>
<b>Foundation IRBA</b>					
Central governments and central banks	0	0	0	0	0
Institutions	0	0	0	0	0
Corporates	5,826	1,456	901	555	0
of which:					
SMEs	89	7	0	7	0
Specialized lending	388	872	872	0	0
Other	5,350	577	29	548	0
<b>Total foundation IRBA</b>	<b>5,827</b>	<b>1,456</b>	<b>901</b>	<b>555</b>	<b>0</b>
<b>Standardized approach</b>					
Central governments or central banks	71,837	1	1	0	0
Regional governments or local authorities	8,022	25	11	1	0
Public sector entities	6,953	0	0	0	0
Multilateral development banks	3,738	0	0	0	0
International organizations	2,149	0	0	0	0
Institutions	2,647	1	0	0	0
Corporates	9,717	4,985	4,462	141	0
Retail	3,310	465	403	48	0
Secured by mortgages on immovable property	69	4,527	4,114	30	0
Exposures in default <sup>1</sup>	619	370	357	7	0
Items associated with particularly high risk	23	293	272	5	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	49	0	0	0	0
Other items	3	0	0	0	0
<b>Total standardized approach</b>	<b>108,518</b>	<b>10,298</b>	<b>9,263</b>	<b>225</b>	<b>0</b>
<b>Total</b>	<b>571,448</b>	<b>330,704</b>	<b>251,442</b>	<b>37,514</b>	<b>34</b>

<sup>1</sup> In line with EBA guidance (Q&A 2017\_3481) we present the total of defaulted exposure, but also include assignments into their respective exposure classes. In order to avoid double counting of exposures, the Total standardized approach figures don't take into account figures disclosed under row Exposure in default.

	Jun 30, 2019				
	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
<b>Advanced IRBA</b>					
Central governments and central banks	125,064	2,817	102	2,281	0
Institutions	22,192	1,953	1,321	320	34
Corporates	244,104	139,020	89,968	18,060	5,003
of which:					
SMEs	9,027	9,688	5,716	1,810	0
Specialized lending	8,182	32,320	27,843	812	0
Other	226,895	97,012	56,409	15,438	5,003
Retail	61,896	157,128	140,503	2,254	0
of which:					
Secured by real estate property SMEs	928	8,325	6,959	175	0
Secured by real estate property non-SMEs	14,359	143,096	131,113	536	0
Qualifying revolving	16,252	60	32	1	0
Other retail SMEs	3,534	2,194	441	1,264	0
Other retail non-SMEs	26,823	3,454	1,959	279	0
Equity	2,068	0	0	0	0
Other non-credit obligation asset	10,033	0	0	0	0
<b>Total advanced IRBA</b>	<b>465,356</b>	<b>300,919</b>	<b>231,894</b>	<b>22,915</b>	<b>5,037</b>
<b>Foundation IRBA</b>					
Central governments and central banks	4	0	0	0	0
Institutions	538	0	0	0	0
Corporates	5,389	1,538	788	597	0
of which:					
SMEs	81	4	0	3	0
Specialized lending	520	769	756	0	0
Other	4,788	764	33	594	0
<b>Total foundation IRBA</b>	<b>5,931</b>	<b>1,538</b>	<b>788</b>	<b>597</b>	<b>0</b>
<b>Standardized approach</b>					
Central governments or central banks	83,147	2	1	1	0
Regional governments or local authorities	8,286	22	8	1	0
Public sector entities	7,088	1	0	0	0
Multilateral development banks	4,154	0	0	0	0
International organizations	2,295	0	0	0	0
Institutions	2,721	17	9	7	0
Corporates	15,012	4,495	4,109	94	0
Retail	4,353	611	370	65	0
Secured by mortgages on immovable property	(187)	4,881	4,411	58	0
Exposures in default <sup>1</sup>	599	374	357	12	0
Items associated with particularly high risk	(98)	480	464	5	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	52	0	0	0	0
Other items	8	0	0	0	0
<b>Total standardized approach</b>	<b>126,831</b>	<b>10,508</b>	<b>9,372</b>	<b>232</b>	<b>0</b>
<b>Total</b>	<b>598,118</b>	<b>312,965</b>	<b>242,055</b>	<b>23,744</b>	<b>5,037</b>

<sup>1</sup> In line with EBA guidance (Q&A 2017\_3481) we present the total of defaulted exposure, but also include assignments into their respective exposure classes. In order to avoid double counting of exposures, the Total standardized approach figures don't take into account figures disclosed under row Exposure in default.

# Credit risk and credit risk mitigation in the standardized approach

## Qualitative information on the use of the 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 regulatory 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 87 for a mapping of internal ratings and probability of defaults.

## Quantitative information on the use of the standardized approach

### Article 444 (e) CRR - Standardized approach exposure by risk weight before and after credit mitigation

The table below shows our credit risk exposure before and post 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, 2019						
							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						71,742	206	71,789	89	60	0.08%	
2	Regional government or local authorities						6,759	1,358	6,762	77	5	0.08%	
3	Public sector entities						6,936	19	6,935	7	49	0.70%	
4	Multilateral development banks						3,743	0	3,747	0	0	0%	
5	International organizations						2,152	0	2,151	0	0	0%	
6	Institutions						1,073	246	1,073	15	89	8.13%	
7	Corporates						11,911	2,932	9,287	646	9,716	97.81%	
8	Retail						2,921	1,375	2,485	24	1,864	74.31%	
9	Secured by mortgages on immovable property						3,561	70	3,553	34	1,330	37.07%	
10	Exposures in default						1,199	14	921	3	1,270	137.37%	
11	Items associated with particularly high risk						437	14	122	1	185	150.00%	
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						49	0	49	0	49	100.00%	
16	Other items						3	1,659	3	1,659	1,660	99.84%	
17	<b>Total</b>						<b>112,484</b>	<b>7,892</b>	<b>108,878</b>	<b>2,557</b>	<b>16,277</b>	<b>14.61%</b>	

							Jun 30, 2019						
							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						83,170	55	83,218	12	1	0%	
2	Regional government or local authorities						7,958	398	7,968	68	8	0.10%	
3	Public sector entities						7,045	42	7,044	16	62	0.88%	
4	Multilateral development banks						4,155	0	4,154	0	0	0%	
5	International organizations						2,296	0	2,296	0	0	0%	
6	Institutions						1,417	60	1,417	64	184	12.45%	
7	Corporates						13,197	4,618	10,439	872	11,005	97.29%	
8	Retail						3,115	1,531	2,691	56	2,040	74.26%	
9	Secured by mortgages on immovable property						3,876	74	3,866	36	1,486	38.09%	
10	Exposures in default						1,233	10	928	2	1,286	138.25%	
11	Items associated with particularly high risk						505	21	182	1	274	150.00%	
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						52	0	52	0	52	100.00%	
16	Other items						8	1,812	8	1,812	1,813	99.63%	
17	<b>Total</b>						<b>128,027</b>	<b>8,621</b>	<b>124,263</b>	<b>2,938</b>	<b>18,212</b>	<b>14.32%</b>	

Our RWA for credit risk (excluding CCR) in the standardized approach were at € 16.3 billion as of December 31, 2019, compared to € 18.2 billion as of June 30, 2019. The decrease of € 1.9 billion was primarily driven by the corporate portfolios across different business lines.

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 after the shift to the exposure class of the protection seller.

EU CR5 – Standardized approach

		Dec 31, 2019					Risk Weight
in € m.		0%	2%	4%	10%	20%	35%
Exposure classes							
1	Central governments or central banks	71,818	0	0	0	0	0
2	Regional governments or local authorities	6,822	0	0	0	16	0
3	Public sector entities	6,699	0	0	0	243	0
4	Multilateral development banks	3,747	0	0	0	0	0
5	International organizations	2,151	0	0	0	0	0
6	Institutions	739	0	0	0	313	0
7	Corporates	0	0	0	0	246	0
8	Retail	0	0	0	0	0	0
9	Secured by mortgages on immovable property	0	0	0	0	0	3,091
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	3	0
17	<b>Total</b>	<b>91,976</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>820</b>	<b>3,091</b>

		Dec 31, 2019					Risk Weight
in € m.		50%	70%	75%	100%	150%	250%
Exposure classes							
1	Central governments or central banks	0	0	0	60	0	0
2	Regional governments or local authorities	0	0	0	2	0	0
3	Public sector entities	0	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	21	0	0	16	0	0
7	Corporates	30	0	0	9,589	69	0
8	Retail	0	0	2,509	0	0	0
9	Secured by mortgages on immovable property	496	0	0	0	0	0
10	Exposures in default	0	0	0	233	691	0
11	Items associated with particularly high risk	0	0	0	0	123	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	49	0	0
16	Other items	0	0	0	1,659	0	0
17	<b>Total</b>	<b>547</b>	<b>0</b>	<b>2,509</b>	<b>11,609</b>	<b>883</b>	<b>0</b>

		Dec 31, 2019					Of which: unrated
in € m.		Risk Weight				Total	
Exposure classes		370%	1250%	Others	Deducted		
1	Central governments or central banks	0	0	0	0	71,878	69,159
2	Regional governments or local authorities	0	0	0	0	6,839	4,195
3	Public sector entities	0	0	0	0	6,942	6,742
4	Multilateral development banks	0	0	0	0	3,747	3,411
5	International organizations	0	0	0	0	2,151	1,879
6	Institutions	0	0	0	0	1,088	1,079
7	Corporates	0	0	0	0	9,934	9,618
8	Retail	0	0	0	0	2,509	2,509
9	Secured by mortgages on immovable property	0	0	0	0	3,587	3,571
10	Exposures in default	0	0	0	0	924	924
11	Items associated with particularly high risk	0	0	0	0	123	123
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	49	49
16	Other items	0	0	0	0	1,662	1,662
17	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>111,435</b>	<b>104,923</b>

		Jun 30, 2019					
in € m.		Risk Weight					
Exposure classes		0%	2%	4%	10%	20%	35%
1	Central governments or central banks	83,228	0	0	0	0	0
2	Regional governments or local authorities	8,003	0	0	0	27	0
3	Public sector entities	6,762	0	0	0	289	0
4	Multilateral development banks	4,154	0	0	0	0	0
5	International organizations	2,296	0	0	0	0	0
6	Institutions	813	0	0	0	548	0
7	Corporates	0	0	0	0	314	0
8	Retail	0	0	0	0	0	0
9	Secured by mortgages on immovable property	0	0	0	0	0	3,096
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	8	0
17	<b>Total</b>	<b>105,258</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,186</b>	<b>3,096</b>

		Jun 30, 2019					
in € m.		Risk Weight					
Exposure classes		50%	70%	75%	100%	150%	250%
1	Central governments or central banks	0	0	0	1	0	0
2	Regional governments or local authorities	5	0	0	0	0	0
3	Public sector entities	9	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	88	0	0	30	0	0
7	Corporates	91	0	0	10,822	84	0
8	Retail	0	0	2,747	0	0	0
9	Secured by mortgages on immovable property	806	0	0	0	0	0
10	Exposures in default	0	0	0	218	711	0
11	Items associated with particularly high risk	0	0	0	0	183	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	52	0	0
16	Other items	0	0	0	1,812	0	0
17	<b>Total</b>	<b>999</b>	<b>0</b>	<b>2,747</b>	<b>12,937</b>	<b>978</b>	<b>0</b>

		Jun 30, 2019					
in € m.		Risk Weight					
Exposure classes		370%	1250%	Others	Deducted	Total	Of which: unrated
1	Central governments or central banks	0	0	0	0	83,230	78,949
2	Regional governments or local authorities	0	0	0	0	8,036	4,424
3	Public sector entities	0	0	0	0	7,060	6,754
4	Multilateral development banks	0	0	0	0	4,154	3,715
5	International organizations	0	0	0	0	2,296	2,022
6	Institutions	0	0	0	0	1,480	1,448
7	Corporates	0	0	0	0	11,311	11,156
8	Retail	0	0	0	0	2,747	2,747
9	Secured by mortgages on immovable property	0	0	0	0	3,902	3,902
10	Exposures in default	0	0	0	0	930	930
11	Items associated with particularly high risk	0	0	0	0	183	183
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	52	52
16	Other items	0	0	0	0	1,820	1,820
17	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>127,201</b>	<b>118,102</b>

# 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 58 internally developed rating systems for regulatory capital calculation purposes excluding exposures in former 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 former 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 and credit risk mitigation in the standardized approach” on page 83 within this report.

Our advanced IRBA coverage ratio, excluding former Postbank, amounted to 96.7 % by exposure value (“EAD”) and 92.9 % by RWA as of December 31, 2019, using applicable measures according to Section 11 SolvV. It increased from the levels at December 31, 2018, which amounted to 96.4 % by EAD and 90.5 % by RWA. In those recent periods where our RWA-based coverage ratio was below the required threshold of 92 %, the ECB as our competent authority was informed and required actions (if any) have been discussed jointly. 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 (except those calculated according to the supervisory formula approach).

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, 2019				Dec 31, 2018			
	Advanced IRBA	Foundation IRBA	Standardized Approach	Total	Advanced IRBA	Foundation IRBA	Standardized Approach	Total
Sovereign related exposure	16	0	11	27	14	0	15	29
Institutions	5	0	1	6	5	0	1	7
Corporates	37	1	1	39	37	1	2	40
Retail	25	0	1	26	23	0	1	23
Other items	1	0	0	2	1	0	0	1
<b>Total</b>	<b>84</b>	<b>1</b>	<b>15</b>	<b>100</b>	<b>80</b>	<b>1</b>	<b>19</b>	<b>100</b>

### 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) - Internal rating-based approaches” on page 88 in this report as well as chapter “Credit risk management”, section “Measuring credit risk” in our Annual Report 2019 on page 67. 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) - Internal rating-based approaches” below on page 88.

### 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 79 as well as to the Annual Report 2019, section “Managing and mitigation of credit risk” on page 73.

### Article 452 (b)(iv) CRR - Controls around rating systems

#### Credit Risk Advanced IRBA – Model Validation

As an important element of our risk management framework we regularly validate our credit risk models and according credit risk parameters.

According to our standards, and in line with the CRR-defined minimum requirements, the credit risk parameters PD, LGD and EAD are validated annually. The validation process is coordinated and supervised by Deutsche Bank’s Model Risk Management 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.

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 page 106.

### 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 former 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 128 to 143.

## 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 and a risk weight of 100 % for all other cases.

## 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, 2019
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 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
<b>Central governments and central banks</b>												
0.00 to <0.15	106,632	191	37.59	114,836	0.01	0.1	49.94	1.1	1,514	1.32	3	–
0.15 to <0.25	4,361	0	81.47	4,405	0.23	<0.1	50.00	1.9	2,108	47.87	5	–
0.25 to <0.50	157	69	27.34	166	0.39	<0.1	49.62	1.4	95	57.23	0	–
0.50 to <0.75	630	19	99.85	441	0.64	<0.1	49.63	1.2	302	68.43	1	–
0.75 to <2.50	193	86	36.46	69	1.57	<0.1	33.15	3.7	68	98.00	0	–
2.50 to <10.00	2,536	717	62.62	852	5.71	<0.1	46.99	3.5	666	78.17	9	–
10.00 to <100.00	177	0	100.00	2	13.00	<0.1	50.00	3.3	5	260.54	0	–
100.00 (Default)	44	0	0	9	100.00	<0.1	48.98	3.5	2	25.34	4	–
<b>Sub-total</b>	<b>114,730</b>	<b>1,082</b>	<b>38.20</b>	<b>120,780</b>	<b>0.06</b>	<b>0.2</b>	<b>49.91</b>	<b>1.1</b>	<b>4,761</b>	<b>3.94</b>	<b>23</b>	<b>14</b>
Dilution risk	11	0	0	11	20.69	0	1.95	1.0	1	7.84	0	0
<b>Sub-total incl. dilution risk</b>	<b>114,741</b>	<b>1,082</b>	<b>38.20</b>	<b>120,791</b>	<b>0.07</b>	<b>0.2</b>	<b>49.91</b>	<b>1.1</b>	<b>4,762</b>	<b>3.94</b>	<b>23</b>	<b>14</b>
<b>Institutions</b>												
0.00 to <0.15	13,066	3,224	35.31	18,468	0.05	0.5	47.02	1.5	1,821	9.86	3	–
0.15 to <0.25	701	264	37.10	789	0.23	0.1	38.56	1.3	352	44.66	1	–
0.25 to <0.50	325	194	40.66	406	0.39	0.1	44.72	1.1	244	60.16	1	–
0.50 to <0.75	1,011	266	67.97	1,244	0.64	<0.1	22.54	2.3	591	47.53	2	–
0.75 to <2.50	560	192	42.77	634	1.41	0.1	34.23	1.2	352	55.53	1	–
2.50 to <10.00	1,166	301	81.53	1,226	3.42	<0.1	13.94	2.7	565	46.04	6	–
10.00 to <100.00	55	76	23.95	64	13.14	<0.1	8.19	0.9	24	37.83	1	–
100.00 (Default)	63	0	25.22	63	100.00	<0.1	3.28	2.0	21	33.13	0	–
<b>Sub-total</b>	<b>16,947</b>	<b>4,519</b>	<b>36.64</b>	<b>22,894</b>	<b>0.62</b>	<b>0.8</b>	<b>43.00</b>	<b>1.6</b>	<b>3,971</b>	<b>17.35</b>	<b>16</b>	<b>7</b>
Dilution risk	167	1	20.00	131	24.24	0	1.18	1.0	8	6.02	0	0
<b>Sub-total incl. dilution risk</b>	<b>17,114</b>	<b>4,520</b>	<b>36.64</b>	<b>23,025</b>	<b>0.76</b>	<b>0.8</b>	<b>42.76</b>	<b>1.6</b>	<b>3,979</b>	<b>17.28</b>	<b>16</b>	<b>7</b>
<b>Corporates</b>												
0.00 to <0.15	64,081	117,782	29.91	100,620	0.08	19.6	31.88	2.0	17,926	17.82	27	–
0.15 to <0.25	19,769	22,108	32.33	27,426	0.22	6.3	31.10	2.3	8,888	32.41	19	–
0.25 to <0.50	18,183	16,392	34.10	23,766	0.39	5.8	25.99	2.3	8,331	35.05	24	–
0.50 to <0.75	16,501	13,028	30.36	19,532	0.65	4.9	22.33	2.6	7,467	38.23	28	–
0.75 to <2.50	31,298	18,413	31.19	33,599	1.46	6.4	21.16	2.7	15,930	47.41	100	–
2.50 to <10.00	27,679	25,483	30.51	31,778	4.87	3.5	15.98	2.6	17,327	54.52	237	–
10.00 to <100.00	7,363	3,829	31.00	7,951	17.78	0.8	10.30	1.9	3,890	48.93	139	–
100.00 (Default)	10,084	1,470	31.13	10,276	100.00	1.8	44.65	2.0	2,275	22.13	4,186	–
<b>Sub-total</b>	<b>194,958</b>	<b>218,506</b>	<b>30.71</b>	<b>254,947</b>	<b>5.53</b>	<b>49.0</b>	<b>26.96</b>	<b>2.3</b>	<b>82,033</b>	<b>32.18</b>	<b>4,759</b>	<b>4,569</b>
Dilution risk	2,915	268	33.74	3,187	22.43	0	2.29	1.0	283	8.88	9	0
<b>Sub-total incl. dilution risk</b>	<b>197,873</b>	<b>218,774</b>	<b>30.72</b>	<b>258,135</b>	<b>5.73</b>	<b>49.0</b>	<b>26.66</b>	<b>2.3</b>	<b>82,316</b>	<b>31.89</b>	<b>4,768</b>	<b>4,569</b>

Dec 31, 2019

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
<b>of which:</b>												
<b>SMEs</b>												
0.00 to <0.15	4,815	3,810	32.59	6,213	0.10	6.7	29.05	3.2	1,085	17.47	2	–
0.15 to <0.25	2,005	958	41.62	2,292	0.24	2.7	36.73	2.9	748	32.63	2	–
0.25 to <0.50	2,116	1,104	34.73	2,397	0.42	2.8	29.84	2.5	837	34.92	3	–
0.50 to <0.75	1,471	815	37.07	1,682	0.71	2.2	40.56	2.7	1,007	59.85	5	–
0.75 to <2.50	2,734	1,048	30.91	2,844	1.47	2.9	30.81	2.7	1,915	67.33	15	–
2.50 to <10.00	1,620	708	29.43	1,515	4.58	1.3	30.63	3.2	1,253	82.68	22	–
10.00 to <100.00	222	60	24.89	179	20.76	0.2	41.01	3.1	315	176.30	16	–
100.00 (Default)	405	42	29.29	385	100.00	0.3	48.71	2.0	101	26.15	182	–
<b>Sub-total</b>	<b>15,389</b>	<b>8,547</b>	<b>33.84</b>	<b>17,507</b>	<b>3.24</b>	<b>19.1</b>	<b>33.22</b>	<b>2.9</b>	<b>7,261</b>	<b>41.47</b>	<b>246</b>	<b>239</b>
Dilution risk	5	0	0	7	44.08	0	0.55	1.0	0	2.89	0	0
<b>Sub-total incl. dilution risk</b>	<b>15,394</b>	<b>8,547</b>	<b>33.84</b>	<b>17,515</b>	<b>3.25</b>	<b>19.1</b>	<b>33.21</b>	<b>2.9</b>	<b>7,261</b>	<b>41.45</b>	<b>246</b>	<b>239</b>
<b>Specialized Lending</b>												
0.00 to <0.15	2,434	37	23.33	2,335	0.10	0.1	4.34	3.1	85	3.63	0	–
0.15 to <0.25	3,037	342	57.29	3,217	0.20	0.2	8.40	2.9	309	9.61	1	–
0.25 to <0.50	3,052	54	68.22	3,019	0.39	0.1	9.39	3.4	492	16.29	1	–
0.50 to <0.75	3,568	216	66.72	3,593	0.65	0.1	8.14	3.5	596	16.59	2	–
0.75 to <2.50	8,219	841	45.78	8,351	1.48	0.3	9.40	2.8	1,839	22.03	11	–
2.50 to <10.00	12,439	2,062	28.00	12,613	5.31	0.3	5.78	2.2	2,566	20.35	38	–
10.00 to <100.00	5,473	796	20.51	5,595	16.60	0.1	5.09	1.8	1,418	25.34	47	–
100.00 (Default)	2,037	23	21.71	2,015	100.00	0.1	49.92	2.0	302	14.99	949	–
<b>Sub-total</b>	<b>40,259</b>	<b>4,371</b>	<b>34.71</b>	<b>40,738</b>	<b>9.28</b>	<b>1.3</b>	<b>9.21</b>	<b>2.6</b>	<b>7,607</b>	<b>18.67</b>	<b>1,048</b>	<b>934</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>40,259</b>	<b>4,371</b>	<b>34.71</b>	<b>40,738</b>	<b>9.28</b>	<b>1.3</b>	<b>9.21</b>	<b>2.6</b>	<b>7,607</b>	<b>18.67</b>	<b>1,048</b>	<b>934</b>
<b>Other</b>												
0.00 to <0.15	56,832	113,935	29.81	92,072	0.08	12.8	32.77	1.9	16,756	18.20	25	–
0.15 to <0.25	14,728	20,808	31.47	21,916	0.23	3.4	33.85	2.1	7,831	35.73	16	–
0.25 to <0.50	13,015	15,234	34.00	18,350	0.39	2.9	28.21	2.1	7,002	38.16	20	–
0.50 to <0.75	11,462	11,998	29.23	14,257	0.64	2.6	23.75	2.4	5,865	41.13	22	–
0.75 to <2.50	20,345	16,524	30.42	22,404	1.45	3.3	23.56	2.7	12,176	54.35	74	–
2.50 to <10.00	13,620	22,712	30.75	17,650	4.58	1.9	22.02	2.9	13,508	76.53	178	–
10.00 to <100.00	1,668	2,973	34.39	2,177	20.58	0.4	21.16	2.2	2,157	99.09	76	–
100.00 (Default)	7,641	1,405	31.34	7,875	100.00	1.4	43.10	2.0	1,872	23.77	3,055	–
<b>Sub-total</b>	<b>139,310</b>	<b>205,588</b>	<b>30.49</b>	<b>196,702</b>	<b>4.95</b>	<b>28.7</b>	<b>30.08</b>	<b>2.2</b>	<b>67,166</b>	<b>34.15</b>	<b>3,465</b>	<b>3,396</b>
Dilution risk	2,910	268	33.74	3,180	22.38	0	2.30	1.0	283	8.89	9	0
<b>Sub-total incl. dilution risk</b>	<b>142,220</b>	<b>205,856</b>	<b>30.50</b>	<b>199,882</b>	<b>5.23</b>	<b>28.7</b>	<b>29.64</b>	<b>2.2</b>	<b>67,448</b>	<b>33.74</b>	<b>3,474</b>	<b>3,396</b>

Dec 31, 2019

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
<b>Retail</b>												
0.00 to <0.15	25,947	16,086	63.04	35,842	0.10	2,726.5	15.68	10.0	1,470	4.10	9	–
0.15 to <0.25	33,237	6,261	73.52	37,508	0.22	1,248.0	16.59	6.5	2,985	7.96	17	–
0.25 to <0.50	37,333	4,479	61.01	40,118	0.40	842.5	17.72	7.4	5,001	12.47	30	–
0.50 to <0.75	36,541	3,483	67.69	38,985	0.69	834.8	19.19	7.1	7,654	19.63	55	–
0.75 to <2.50	36,821	3,639	67.70	39,294	0.01	1,452.5	25.00	8.1	14,238	36.24	156	–
2.50 to <10.00	18,155	1,735	77.86	19,247	4.65	868.4	29.77	6.3	11,681	60.69	272	–
10.00 to <100.00	3,744	176	70.22	3,741	20.68	182.8	30.07	5.5	3,833	102.47	238	–
100.00 (Default)	4,237	48	54.72	4,237	100.00	151.9	45.18	2.5	1,145	27.01	1,802	–
<b>Sub-total</b>	<b>196,014</b>	<b>35,907</b>	<b>66.67</b>	<b>218,972</b>	<b>2.95</b>	<b>8,307.4</b>	<b>20.56</b>	<b>7.5</b>	<b>48,007</b>	<b>21.92</b>	<b>2,579</b>	<b>2,593</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>196,014</b>	<b>35,907</b>	<b>66.67</b>	<b>218,972</b>	<b>2.95</b>	<b>8,307.4</b>	<b>20.56</b>	<b>7.5</b>	<b>48,007</b>	<b>21.92</b>	<b>2,579</b>	<b>2,593</b>
<b>of which:</b>												
<b>Secured by real estate property SMEs</b>												
0.00 to <0.15	1,376	153	59.20	1,465	0.12	7.0	11.72	14.5	41	2.77	0	–
0.15 to <0.25	1,587	102	58.25	1,641	0.23	7.6	11.60	14.9	75	4.54	0	–
0.25 to <0.50	1,741	95	56.03	1,784	0.39	8.3	11.99	15.4	121	6.78	1	–
0.50 to <0.75	1,400	74	54.15	1,432	0.65	6.9	12.03	15.4	138	9.62	1	–
0.75 to <2.50	1,625	73	54.48	1,638	1.36	8.2	12.15	15.6	261	15.91	3	–
2.50 to <10.00	663	24	49.09	662	4.50	3.4	11.76	14.5	200	30.17	3	–
10.00 to <100.00	120	2	43.93	117	19.49	0.8	11.94	13.7	63	54.06	3	–
100.00 (Default)	102	0	50.57	102	100.00	0.3	36.20	11.2	32	31.48	36	–
<b>Sub-total</b>	<b>8,617</b>	<b>523</b>	<b>56.54</b>	<b>8,841</b>	<b>2.24</b>	<b>42.5</b>	<b>12.17</b>	<b>15.1</b>	<b>929</b>	<b>10.51</b>	<b>48</b>	<b>54</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>8,617</b>	<b>523</b>	<b>56.54</b>	<b>8,841</b>	<b>2.24</b>	<b>42.5</b>	<b>12.17</b>	<b>15.1</b>	<b>929</b>	<b>10.51</b>	<b>48</b>	<b>54</b>
<b>Secured by real estate property non-SMEs</b>												
0.00 to <0.15	22,185	606	64.41	22,571	0.11	228.2	12.80	14.2	796	3.53	4	–
0.15 to <0.25	29,321	1,324	83.60	30,422	0.22	242.7	15.10	6.8	2,185	7.18	11	–
0.25 to <0.50	32,763	1,492	78.81	33,929	0.40	253.0	15.49	7.5	3,822	11.26	22	–
0.50 to <0.75	31,459	1,603	80.80	32,735	0.69	229.8	16.18	7.2	5,784	17.67	39	–
0.75 to <2.50	24,923	1,970	83.04	26,522	(0.73)	191.2	15.23	9.6	7,095	26.75	61	–
2.50 to <10.00	9,477	1,103	93.67	10,486	4.68	83.6	14.03	8.3	5,032	47.99	72	–
10.00 to <100.00	2,034	86	92.77	2,090	20.89	16.1	15.68	7.5	1,953	93.43	71	–
100.00 (Default)	1,549	13	88.07	1,553	100.00	14.1	18.86	4.8	627	40.35	293	–
<b>Sub-total</b>	<b>153,710</b>	<b>8,197</b>	<b>82.09</b>	<b>160,308</b>	<b>1.71</b>	<b>1,258.7</b>	<b>15.08</b>	<b>8.6</b>	<b>27,294</b>	<b>17.03</b>	<b>571</b>	<b>580</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>153,710</b>	<b>8,197</b>	<b>82.09</b>	<b>160,308</b>	<b>1.71</b>	<b>1,258.7</b>	<b>15.08</b>	<b>8.6</b>	<b>27,294</b>	<b>17.03</b>	<b>571</b>	<b>580</b>

Dec 31, 2019

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
<b>Qualifying Revolving</b>												
0.00 to <0.15	43	10,152	88.42	7,203	0.07	2,235.6	11.65	0.0	203	2.82	3	–
0.15 to <0.25	93	2,918	91.44	2,199	0.20	800.3	6.58	0.0	153	6.97	3	–
0.25 to <0.50	129	951	78.56	768	0.39	376.4	15.72	0.0	85	11.05	2	–
0.50 to <0.75	168	626	72.75	569	0.69	335.9	19.35	0.0	99	17.35	2	–
0.75 to <2.50	276	510	70.59	597	1.53	405.1	22.81	0.0	186	31.20	5	–
2.50 to <10.00	188	177	71.97	299	4.78	232.4	23.95	0.0	220	73.50	8	–
10.00 to <100.00	51	17	71.77	62	20.86	49.1	26.96	0.0	92	149.53	7	–
100.00 (Default)	61	2	62.13	62	100.00	34.4	32.53	0.0	44	71.20	38	–
<b>Sub-total</b>	<b>1,009</b>	<b>15,352</b>	<b>86.73</b>	<b>11,759</b>	<b>0.98</b>	<b>4,469.1</b>	<b>12.36</b>	<b>0.0</b>	<b>1,083</b>	<b>9.21</b>	<b>68</b>	<b>76</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>1,009</b>	<b>15,352</b>	<b>86.73</b>	<b>11,759</b>	<b>0.98</b>	<b>4,469.1</b>	<b>12.36</b>	<b>0.0</b>	<b>1,083</b>	<b>9.21</b>	<b>68</b>	<b>76</b>
<b>Other retail SMEs</b>												
0.00 to <0.15	415	2,321	19.04	1,133	0.11	32.4	42.48	3.9	106	9.38	1	–
0.15 to <0.25	427	1,099	25.86	820	0.23	38.0	41.91	3.5	125	15.26	1	–
0.25 to <0.50	537	1,187	21.15	899	0.39	38.7	45.28	3.4	209	23.27	2	–
0.50 to <0.75	566	590	27.11	866	0.65	25.0	50.98	2.8	301	34.76	3	–
0.75 to <2.50	969	591	31.15	1,231	1.36	24.5	55.11	2.8	631	51.27	9	–
2.50 to <10.00	669	262	32.71	555	4.55	14.7	56.38	2.6	367	66.21	14	–
10.00 to <100.00	186	39	32.04	108	21.59	4.5	58.20	2.5	111	102.48	13	–
100.00 (Default)	239	14	32.45	230	100.00	3.6	57.89	1.9	66	28.58	132	–
<b>Sub-total</b>	<b>4,009</b>	<b>6,103</b>	<b>23.52</b>	<b>5,841</b>	<b>5.27</b>	<b>181.6</b>	<b>48.97</b>	<b>3.2</b>	<b>1,916</b>	<b>32.81</b>	<b>174</b>	<b>204</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>4,009</b>	<b>6,103</b>	<b>23.52</b>	<b>5,841</b>	<b>5.27</b>	<b>181.6</b>	<b>48.97</b>	<b>3.2</b>	<b>1,916</b>	<b>32.81</b>	<b>174</b>	<b>204</b>
<b>Other retail non-SMEs</b>												
0.00 to <0.15	1,927	2,854	30.35	3,469	0.09	414.6	35.76	3.4	324	9.33	1	–
0.15 to <0.25	1,809	818	69.14	2,425	0.23	230.8	39.08	4.2	447	18.41	2	–
0.25 to <0.50	2,163	754	70.17	2,739	0.40	236.5	40.55	4.9	764	27.90	5	–
0.50 to <0.75	2,947	590	68.43	3,384	0.69	298.9	43.20	4.2	1,333	39.39	10	–
0.75 to <2.50	9,028	495	47.49	9,306	1.62	906.8	51.25	3.7	6,065	65.18	78	–
2.50 to <10.00	7,159	169	50.28	7,246	4.61	574.3	52.40	3.3	5,862	80.90	174	–
10.00 to <100.00	1,352	32	53.26	1,364	20.39	120.6	51.57	2.1	1,614	118.33	144	–
100.00 (Default)	2,285	20	49.01	2,291	100.00	103.7	47.87	0.7	376	16.42	1,303	–
<b>Sub-total</b>	<b>28,669</b>	<b>5,731</b>	<b>47.36</b>	<b>32,224</b>	<b>9.61</b>	<b>2,886.2</b>	<b>47.82</b>	<b>3.5</b>	<b>16,785</b>	<b>52.09</b>	<b>1,718</b>	<b>1,680</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>28,669</b>	<b>5,731</b>	<b>47.36</b>	<b>32,224</b>	<b>9.61</b>	<b>2,886.2</b>	<b>47.82</b>	<b>3.5</b>	<b>16,785</b>	<b>52.09</b>	<b>1,718</b>	<b>1,680</b>
<b>All exposure classes</b>												
Dilution risk	3,093	269	33.70	3,329	22.50	0.3	2.25	1.0	292	8.76	9	0
<b>Total incl. dilution risk</b>	<b>525,741</b>	<b>260,282</b>	<b>36.10</b>	<b>620,923</b>	<b>3.46</b>	<b>8,356.1</b>	<b>29.64</b>	<b>3.9</b>	<b>139,064</b>	<b>22.40</b>	<b>7,385</b>	<b>7,184</b>

Jun 30, 2019

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
<b>Central governments and central banks</b>												
0.00 to <0.15	114,364	98	43.33	123,466	0.00	0.1	49.97	1.4	1,960	1.59	2	–
0.15 to <0.25	4,372	0	72.93	4,407	0.23	<0.1	50.00	1.7	1,993	45.23	5	–
0.25 to <0.50	284	103	99.97	201	0.39	<0.1	44.58	2.9	53	26.52	0	–
0.50 to <0.75	532	2	78.29	474	0.64	<0.1	45.67	1.6	327	69.00	2	–
0.75 to <2.50	269	84	29.11	130	1.36	<0.1	44.54	3.3	132	101.18	1	–
2.50 to <10.00	2,548	251	99.99	934	5.16	<0.1	48.51	4.0	621	66.47	5	–
10.00 to <100.00	421	138	100.00	59	13.00	<0.1	20.39	1.1	57	95.97	2	–
100.00 (Default)	69	0	0	10	100.00	<0.1	54.70	3.9	9	94.64	4	–
<b>Sub-total</b>	<b>122,859</b>	<b>677</b>	<b>45.98</b>	<b>129,682</b>	<b>0.07</b>	<b>0.2</b>	<b>49.92</b>	<b>1.4</b>	<b>5,153</b>	<b>3.97</b>	<b>21</b>	<b>13</b>
Dilution risk	27	0	100.00	27	10.45	0	2.41	1.0	3	10.18	0	0
<b>Sub-total incl. dilution risk</b>	<b>122,885</b>	<b>677</b>	<b>45.98</b>	<b>129,709</b>	<b>0.07</b>	<b>0.2</b>	<b>49.91</b>	<b>1.4</b>	<b>5,156</b>	<b>3.98</b>	<b>21</b>	<b>13</b>
<b>Institutions</b>												
0.00 to <0.15	13,437	4,155	38.14	18,610	0.06	0.5	44.72	1.6	2,097	11.27	3	–
0.15 to <0.25	960	289	36.02	1,030	0.23	0.1	32.85	1.5	344	33.37	1	–
0.25 to <0.50	489	285	33.53	614	0.39	0.1	44.35	0.8	314	51.14	1	–
0.50 to <0.75	946	309	47.12	1,280	0.64	0.1	30.25	2.5	781	61.05	3	–
0.75 to <2.50	1,017	233	41.82	1,021	1.47	0.1	39.74	1.2	540	52.93	2	–
2.50 to <10.00	1,070	206	64.04	1,028	3.18	<0.1	10.08	3.2	313	30.42	4	–
10.00 to <100.00	91	74	26.86	103	13.11	<0.1	5.27	1.0	25	24.05	1	–
100.00 (Default)	204	3	20.00	205	100.00	<0.1	0.86	1.3	20	9.80	0	–
<b>Sub-total</b>	<b>18,215</b>	<b>5,556</b>	<b>38.37</b>	<b>23,889</b>	<b>1.21</b>	<b>0.8</b>	<b>41.17</b>	<b>1.7</b>	<b>4,434</b>	<b>18.56</b>	<b>15</b>	<b>7</b>
Dilution risk	188	0	25.00	171	10.45	0	2.41	1.0	17	10.16	0	0
<b>Sub-total incl. dilution risk</b>	<b>18,403</b>	<b>5,557</b>	<b>38.37</b>	<b>24,060</b>	<b>1.28</b>	<b>0.8</b>	<b>40.90</b>	<b>1.7</b>	<b>4,451</b>	<b>18.50</b>	<b>15</b>	<b>7</b>
<b>Corporates</b>												
0.00 to <0.15	63,940	120,155	28.42	99,437	0.08	19.6	32.85	2.0	17,421	17.52	25	–
0.15 to <0.25	18,731	23,519	30.12	26,774	0.22	6.3	32.81	2.3	9,525	35.58	20	–
0.25 to <0.50	15,710	13,170	28.38	19,542	0.39	5.7	27.86	2.3	7,325	37.48	21	–
0.50 to <0.75	14,308	11,124	29.85	17,036	0.65	4.9	25.43	2.7	7,411	43.50	29	–
0.75 to <2.50	29,134	24,114	29.88	33,759	1.42	6.6	23.10	2.8	18,095	53.60	108	–
2.50 to <10.00	24,928	27,329	31.30	29,930	4.89	3.5	16.69	2.8	17,227	57.56	229	–
10.00 to <100.00	8,600	5,534	31.83	9,576	16.42	0.9	10.21	1.8	4,962	51.82	168	–
100.00 (Default)	10,119	1,168	55.21	10,387	100.00	1.7	40.65	2.0	2,402	23.12	4,353	–
<b>Sub-total</b>	<b>185,471</b>	<b>226,113</b>	<b>29.32</b>	<b>246,441</b>	<b>5.77</b>	<b>49.2</b>	<b>28.09</b>	<b>2.3</b>	<b>84,367</b>	<b>34.23</b>	<b>4,954</b>	<b>4,845</b>
Dilution risk	3,438	107	29.06	3,648	10.45	0	2.48	1.0	384	10.51	9	0
<b>Sub-total incl. dilution risk</b>	<b>188,909</b>	<b>226,220</b>	<b>29.32</b>	<b>250,089</b>	<b>5.84</b>	<b>49.2</b>	<b>27.72</b>	<b>2.3</b>	<b>84,751</b>	<b>33.89</b>	<b>4,963</b>	<b>4,845</b>



Jun 30, 2019

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
<b>of which:</b>												
<b>SMEs</b>												
0.00 to <0.15	4,519	3,009	30.47	5,667	0.08	6.4	31.08	2.8	965	17.03	2	–
0.15 to <0.25	1,860	907	41.70	2,204	0.22	2.6	36.97	2.9	759	34.44	2	–
0.25 to <0.50	1,690	979	35.79	1,977	0.39	2.6	33.08	2.8	789	39.92	3	–
0.50 to <0.75	1,247	652	35.42	1,435	0.65	2.1	39.89	2.9	908	63.29	4	–
0.75 to <2.50	1,901	911	28.66	2,061	1.42	2.9	36.66	2.8	1,486	72.11	12	–
2.50 to <10.00	1,121	515	33.95	1,059	4.78	1.3	32.11	2.6	905	85.46	18	–
10.00 to <100.00	240	60	21.58	209	19.02	0.2	42.52	2.4	358	171.29	16	–
100.00 (Default)	423	43	28.25	442	100.00	0.3	42.90	2.0	113	25.57	179	–
<b>Sub-total</b>	<b>13,002</b>	<b>7,077</b>	<b>33.05</b>	<b>15,053</b>	<b>3.90</b>	<b>18.5</b>	<b>34.39</b>	<b>2.8</b>	<b>6,283</b>	<b>41.74</b>	<b>236</b>	<b>216</b>
Dilution risk	1	0	0	17	10.45	0	2.43	1.0	2	10.78	0	0
<b>Sub-total incl. dilution risk</b>	<b>13,003</b>	<b>7,077</b>	<b>33.05</b>	<b>15,069</b>	<b>3.91</b>	<b>18.5</b>	<b>34.35</b>	<b>2.8</b>	<b>6,285</b>	<b>41.71</b>	<b>236</b>	<b>216</b>
<b>Specialized Lending</b>												
0.00 to <0.15	1,833	190	75.54	1,859	0.09	0.1	10.71	3.3	139	7.49	0	–
0.15 to <0.25	2,553	115	38.36	2,586	0.20	0.2	7.96	3.1	233	9.01	0	–
0.25 to <0.50	2,256	42	70.67	2,156	0.39	0.1	15.12	3.1	555	25.72	1	–
0.50 to <0.75	1,945	1,185	34.22	2,289	0.66	0.1	11.95	3.7	527	23.03	2	–
0.75 to <2.50	7,609	1,094	54.30	7,919	1.46	0.3	11.40	2.7	2,284	28.84	13	–
2.50 to <10.00	10,845	1,650	29.29	10,966	5.47	0.3	6.32	2.5	2,441	22.26	35	–
10.00 to <100.00	6,783	1,467	26.01	7,038	15.94	0.2	6.42	1.6	2,290	32.54	76	–
100.00 (Default)	2,404	54	25.33	2,404	100.00	0.2	44.75	1.8	445	18.50	853	–
<b>Sub-total</b>	<b>36,229</b>	<b>5,798</b>	<b>36.44</b>	<b>37,217</b>	<b>11.48</b>	<b>1.3</b>	<b>11.09</b>	<b>2.5</b>	<b>8,914</b>	<b>23.95</b>	<b>980</b>	<b>955</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>36,229</b>	<b>5,798</b>	<b>36.44</b>	<b>37,217</b>	<b>11.48</b>	<b>1.3</b>	<b>11.09</b>	<b>2.5</b>	<b>8,914</b>	<b>23.95</b>	<b>980</b>	<b>955</b>
<b>Other</b>												
0.00 to <0.15	57,588	116,956	28.30	91,911	0.08	13.2	33.26	1.9	16,317	17.75	23	–
0.15 to <0.25	14,318	22,496	29.61	21,984	0.23	3.6	35.31	2.2	8,533	38.81	18	–
0.25 to <0.50	11,764	12,148	27.64	15,409	0.39	3.0	28.98	2.1	5,981	38.81	17	–
0.50 to <0.75	11,116	9,287	28.90	13,313	0.64	2.7	26.19	2.4	5,975	44.89	23	–
0.75 to <2.50	19,623	22,109	28.76	23,779	1.41	3.4	25.82	2.9	14,325	60.24	84	–
2.50 to <10.00	12,961	25,163	31.39	17,905	4.55	1.9	22.13	3.0	13,881	77.53	176	–
10.00 to <100.00	1,577	4,008	33.87	2,329	17.65	0.5	18.78	2.3	2,314	99.35	77	–
100.00 (Default)	7,292	1,071	57.81	7,541	100.00	1.2	39.21	2.1	1,844	24.46	3,320	–
<b>Sub-total</b>	<b>136,239</b>	<b>213,238</b>	<b>29.01</b>	<b>194,171</b>	<b>4.82</b>	<b>29.5</b>	<b>30.86</b>	<b>2.2</b>	<b>69,170</b>	<b>35.62</b>	<b>3,738</b>	<b>3,674</b>
Dilution risk	3,437	107	29.06	3,631	10.45	0	2.48	1.0	382	10.51	9	0
<b>Sub-total incl. dilution risk</b>	<b>139,676</b>	<b>213,345</b>	<b>29.01</b>	<b>197,802</b>	<b>4.92</b>	<b>29.5</b>	<b>30.34</b>	<b>2.2</b>	<b>69,552</b>	<b>35.16</b>	<b>3,747</b>	<b>3,674</b>

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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
<b>Retail</b>												
0.00 to <0.15	25,839	16,334	62.56	35,499	0.09	2,728.2	14.90	10.0	1,410	3.97	8	–
0.15 to <0.25	32,322	6,276	74.31	36,633	0.22	1,282.9	16.10	6.5	2,865	7.82	16	–
0.25 to <0.50	36,266	4,440	60.94	39,044	0.39	858.9	17.11	7.4	4,732	12.12	28	–
0.50 to <0.75	35,512	3,484	68.01	37,969	0.67	918.1	18.60	7.0	7,293	19.21	52	–
0.75 to <2.50	35,346	3,646	68.88	37,960	1.46	1,481.3	24.32	8.1	13,586	35.79	147	–
2.50 to <10.00	18,045	1,804	77.79	19,246	4.53	860.1	28.63	6.2	11,481	59.65	261	–
10.00 to <100.00	3,810	174	69.03	3,841	20.15	187.9	29.16	5.9	3,869	100.73	239	–
100.00 (Default)	3,980	45	55.22	4,163	100.00	158.5	41.66	2.8	1,104	26.52	1,891	–
<b>Sub-total</b>	<b>191,120</b>	<b>36,203</b>	<b>66.75</b>	<b>214,354</b>	<b>3.21</b>	<b>8,475.8</b>	<b>19.84</b>	<b>7.5</b>	<b>46,340</b>	<b>21.62</b>	<b>2,641</b>	<b>2,599</b>
Dilution risk	0	0	0	0	0	0	0	0	0	N/M	0	0
<b>Sub-total incl. dilution risk</b>	<b>191,120</b>	<b>36,203</b>	<b>66.75</b>	<b>214,354</b>	<b>3.21</b>	<b>8,475.8</b>	<b>19.84</b>	<b>7.5</b>	<b>46,340</b>	<b>21.62</b>	<b>2,641</b>	<b>2,599</b>
<b>of which:</b>												
<b>Secured by real estate property SMEs</b>												
0.00 to <0.15	1,434	143	59.87	1,516	0.12	7.1	11.74	14.7	45	2.96	0	–
0.15 to <0.25	1,562	112	56.40	1,621	0.23	7.7	11.29	14.9	75	4.65	0	–
0.25 to <0.50	1,743	100	57.82	1,790	0.39	8.4	11.38	15.0	124	6.90	1	–
0.50 to <0.75	1,429	75	54.07	1,459	0.64	7.2	11.22	15.0	139	9.51	1	–
0.75 to <2.50	1,623	70	52.05	1,633	1.34	8.4	11.55	15.3	257	15.77	3	–
2.50 to <10.00	715	30	48.35	706	4.39	3.6	10.99	14.4	211	29.88	3	–
10.00 to <100.00	144	4	54.36	141	20.89	0.9	11.46	14.1	80	56.94	3	–
100.00 (Default)	111	0	9.95	115	100.00	0.4	35.56	10.5	21	18.14	47	–
<b>Sub-total</b>	<b>8,763</b>	<b>534</b>	<b>56.27</b>	<b>8,982</b>	<b>2.44</b>	<b>43.7</b>	<b>11.71</b>	<b>14.9</b>	<b>952</b>	<b>10.60</b>	<b>59</b>	<b>60</b>
Dilution risk	0	0	0	0	0	0	0	0	0	N/M	0	0
<b>Sub-total incl. dilution risk</b>	<b>8,763</b>	<b>534</b>	<b>56.27</b>	<b>8,982</b>	<b>2.44</b>	<b>43.7</b>	<b>11.71</b>	<b>14.9</b>	<b>952</b>	<b>10.60</b>	<b>59</b>	<b>60</b>
<b>Secured by real estate property non-SMEs</b>												
0.00 to <0.15	22,134	640	64.74	22,569	0.10	231.3	12.43	14.1	783	3.47	3	–
0.15 to <0.25	28,475	1,274	84.97	29,562	0.22	243.5	14.69	6.7	2,073	7.01	10	–
0.25 to <0.50	31,640	1,441	80.65	32,802	0.39	252.2	14.86	7.5	3,566	10.87	20	–
0.50 to <0.75	30,447	1,655	80.47	31,773	0.67	229.4	15.59	7.1	5,443	17.13	36	–
0.75 to <2.50	23,759	2,009	84.11	25,448	1.42	193.3	14.45	9.7	6,591	25.90	55	–
2.50 to <10.00	9,576	1,138	93.70	10,660	4.53	87.3	13.49	8.0	5,007	46.97	69	–
10.00 to <100.00	2,045	82	92.00	2,120	19.98	16.8	14.85	8.1	1,922	90.64	68	–
100.00 (Default)	1,553	12	80.18	1,645	100.00	14.0	20.90	4.9	584	35.52	364	–
<b>Sub-total</b>	<b>149,629</b>	<b>8,250</b>	<b>82.80</b>	<b>156,579</b>	<b>2.13</b>	<b>1,267.8</b>	<b>14.53</b>	<b>8.6</b>	<b>25,970</b>	<b>16.59</b>	<b>625</b>	<b>569</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>149,629</b>	<b>8,250</b>	<b>82.80</b>	<b>156,579</b>	<b>2.13</b>	<b>1,267.8</b>	<b>14.53</b>	<b>8.6</b>	<b>25,970</b>	<b>16.59</b>	<b>625</b>	<b>569</b>

Jun 30, 2019

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
<b>Qualifying Revolving</b>												
0.00 to <0.15	73	10,216	88.47	7,267	0.07	2,244.9	11.40	0.0	205	2.83	3	–
0.15 to <0.25	88	3,079	91.84	2,311	0.19	835.4	6.14	0.0	159	6.89	3	–
0.25 to <0.50	132	989	79.25	800	0.38	396.4	15.13	0.0	88	11.02	2	–
0.50 to <0.75	165	644	73.39	580	0.67	422.5	18.37	0.0	100	17.27	2	–
0.75 to <2.50	272	531	71.14	609	1.49	454.4	22.21	0.0	189	31.04	5	–
2.50 to <10.00	188	185	73.57	306	4.66	239.2	23.48	0.0	229	74.98	8	–
10.00 to <100.00	53	18	73.06	64	20.17	49.5	25.96	0.0	95	148.13	7	–
100.00 (Default)	41	2	61.87	42	100.00	29.0	33.25	0.0	23	55.16	29	–
<b>Sub-total</b>	<b>1,011</b>	<b>15,664</b>	<b>86.94</b>	<b>11,979</b>	<b>0.79</b>	<b>4,671.3</b>	<b>11.98</b>	<b>0.0</b>	<b>1,090</b>	<b>9.10</b>	<b>59</b>	<b>70</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>1,011</b>	<b>15,664</b>	<b>86.94</b>	<b>11,979</b>	<b>0.79</b>	<b>4,671.3</b>	<b>11.98</b>	<b>0.0</b>	<b>1,090</b>	<b>9.10</b>	<b>59</b>	<b>70</b>
<b>Other retail SMEs</b>												
0.00 to <0.15	404	2,406	17.93	1,068	0.11	33.9	42.35	3.8	99	9.30	0	–
0.15 to <0.25	418	1,072	26.76	804	0.23	37.5	41.21	4.0	125	15.58	1	–
0.25 to <0.50	563	1,186	21.48	938	0.39	38.0	45.20	3.6	228	24.30	2	–
0.50 to <0.75	576	579	28.40	861	0.65	25.0	51.67	2.9	319	37.07	3	–
0.75 to <2.50	966	565	30.73	1,250	1.36	24.8	53.53	3.0	664	53.14	10	–
2.50 to <10.00	694	276	31.65	600	4.52	14.6	53.58	2.5	409	68.18	15	–
10.00 to <100.00	193	41	29.75	120	22.28	4.5	50.81	2.6	119	99.05	15	–
100.00 (Default)	255	11	38.16	298	100.00	3.6	60.31	3.0	95	31.99	197	–
<b>Sub-total</b>	<b>4,071</b>	<b>6,136</b>	<b>23.27</b>	<b>5,939</b>	<b>6.42</b>	<b>182.0</b>	<b>48.56</b>	<b>3.3</b>	<b>2,059</b>	<b>34.67</b>	<b>242</b>	<b>236</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>4,071</b>	<b>6,136</b>	<b>23.27</b>	<b>5,939</b>	<b>6.42</b>	<b>182.0</b>	<b>48.56</b>	<b>3.3</b>	<b>2,059</b>	<b>34.67</b>	<b>242</b>	<b>236</b>
<b>Other retail non-SMEs</b>												
0.00 to <0.15	1,793	2,929	30.70	3,078	0.09	375.8	33.28	3.6	277	9.01	1	–
0.15 to <0.25	1,779	739	66.18	2,335	0.22	226.8	38.46	4.2	431	18.47	2	–
0.25 to <0.50	2,188	724	65.47	2,713	0.39	233.6	38.86	4.8	726	26.76	4	–
0.50 to <0.75	2,894	530	66.99	3,295	0.67	295.0	42.38	4.0	1,292	39.22	10	–
0.75 to <2.50	8,726	472	47.81	9,021	1.59	885.1	50.59	3.6	5,884	65.23	74	–
2.50 to <10.00	6,871	175	51.41	6,974	4.55	557.1	51.64	3.3	5,625	80.65	165	–
10.00 to <100.00	1,374	30	53.30	1,396	20.15	125.3	50.97	2.3	1,654	118.43	146	–
100.00 (Default)	2,020	20	49.96	2,062	100.00	115.4	53.87	0.8	380	18.44	1,255	–
<b>Sub-total</b>	<b>27,646</b>	<b>5,619</b>	<b>45.58</b>	<b>30,875</b>	<b>9.21</b>	<b>2,814.1</b>	<b>46.66</b>	<b>3.5</b>	<b>16,270</b>	<b>52.69</b>	<b>1,656</b>	<b>1,663</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>27,646</b>	<b>5,619</b>	<b>45.58</b>	<b>30,875</b>	<b>9.21</b>	<b>2,814.1</b>	<b>46.66</b>	<b>3.5</b>	<b>16,270</b>	<b>52.69</b>	<b>1,656</b>	<b>1,663</b>
<b>All exposure classes</b>												
Dilution risk	3,653	107	29.07	3,845	10.45	0.4	2.47	1.0	404	10.50	10	0
<b>Total incl. dilution risk</b>	<b>521,317</b>	<b>268,656</b>	<b>35.01</b>	<b>618,211</b>	<b>3.54</b>	<b>8,525.0</b>	<b>30.15</b>	<b>3.9</b>	<b>140,699</b>	<b>22.76</b>	<b>7,641</b>	<b>7,464</b>

## 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 128 to 143.

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, 2019												
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
<b>Central governments and central banks</b>												
0.00 to <0.15	0	0	0	0	0.14	<0.1	12.33	2.5	0	0.04	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	–
<b>Sub-total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	<b>&lt;0.1</b>	<b>12.33</b>	<b>2.5</b>	<b>0</b>	<b>0.04</b>	<b>0</b>	<b>0</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	<b>&lt;0.1</b>	<b>12.33</b>	<b>2.5</b>	<b>0</b>	<b>0.04</b>	<b>0</b>	<b>0</b>
<b>Institutions</b>												
0.00 to <0.15	0	3	0	0	0.07	<0.1	12.34	2.5	0	11.31	0	–
0.15 to <0.25	0	0	0	0	0.23	<0.1	42.69	2.5	0	47.59	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	0.69	<0.1	42.69	2.5	0	80.49	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	–
<b>Sub-total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0.07</b>	<b>&lt;0.1</b>	<b>12.36</b>	<b>2.5</b>	<b>0</b>	<b>11.34</b>	<b>0</b>	<b>0</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0.07</b>	<b>&lt;0.1</b>	<b>12.36</b>	<b>2.5</b>	<b>0</b>	<b>11.34</b>	<b>0</b>	<b>0</b>
<b>Corporates</b>												
0.00 to <0.15	1,469	1,432	0	1,947	0.09	6.7	15.51	2.5	262	13.44	0	–
0.15 to <0.25	1,645	1,278	74.41	1,698	0.20	2.0	37.70	2.5	671	39.54	1	–
0.25 to <0.50	1,223	1,395	75.00	1,128	0.38	2.5	29.14	2.5	521	46.16	1	–
0.50 to <0.75	519	496	75.00	453	0.67	1.5	27.84	2.5	256	56.60	1	–
0.75 to <2.50	418	372	75.00	309	1.46	0.6	23.70	2.5	202	65.34	1	–
2.50 to <10.00	111	88	75.00	92	4.37	0.1	18.91	2.5	68	73.81	1	–
10.00 to <100.00	32	31	74.64	35	15.59	0.1	35.83	2.5	65	185.19	2	–
100.00 (Default)	106	15	75.00	107	100.00	0.1	42.90	2.5	0	0	46	–
<b>Sub-total</b>	<b>5,524</b>	<b>5,107</b>	<b>74.64</b>	<b>5,769</b>	<b>15.59</b>	<b>13.5</b>	<b>35.83</b>	<b>2.5</b>	<b>2,045</b>	<b>35.44</b>	<b>53</b>	<b>55</b>
Dilution risk	4,072	8,509	6.52	4,345	0.16	56.7	75.00	1.0	999	22.99	5	0
<b>Sub-total incl. dilution risk</b>	<b>9,596</b>	<b>13,616</b>	<b>32.07</b>	<b>10,115</b>	<b>8.96</b>	<b>70.3</b>	<b>52.66</b>	<b>1.9</b>	<b>3,044</b>	<b>30.09</b>	<b>58</b>	<b>55</b>

in € m.												Dec 31, 2019
(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
<b>of which:</b>												
<b>SMEs</b>												
0.00 to <0.15	0	0	0	0	0.11	<0.1	12.33	2.5	0	6.48	0	–
0.15 to <0.25	24	22	75.00	25	0.21	<0.1	42.99	2.5	9	34.24	0	–
0.25 to <0.50	14	18	75.00	13	0.38	<0.1	40.63	2.5	6	44.73	0	–
0.50 to <0.75	19	5	0	19	0.69	<0.1	40.84	2.5	13	70.88	0	–
0.75 to <2.50	5	12	0	5	1.29	<0.1	29.59	2.5	3	62.02	0	–
2.50 to <10.00	14	3	75.00	12	3.79	<0.1	43.44	2.5	11	89.37	0	–
10.00 to <100.00	2	5	75.00	4	19.86	<0.1	38.49	2.5	5	142.59	0	–
100.00 (Default)	40	0	0	40	100.00	<0.1	45.00	2.5	0	0	18	–
<b>Sub-total</b>	<b>119</b>	<b>66</b>	<b>75.00</b>	<b>118</b>	<b>35.56</b>	<b>0.2</b>	<b>42.43</b>	<b>2.5</b>	<b>47</b>	<b>39.87</b>	<b>19</b>	<b>14</b>
Dilution risk	363	3,044	7.21	579	0.10	45.3	75.00	1.0	98	16.98	0	0
<b>Sub-total incl. dilution risk</b>	<b>483</b>	<b>3,110</b>	<b>8.65</b>	<b>697</b>	<b>6.11</b>	<b>45.4</b>	<b>69.48</b>	<b>1.3</b>	<b>145</b>	<b>20.86</b>	<b>19</b>	<b>14</b>
<b>Specialized Lending</b>												
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	–
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Other</b>												
0.00 to <0.15	1,469	1,431	0	1,947	0.09	6.7	15.51	2.5	262	13.44	0	–
0.15 to <0.25	1,621	1,256	74.39	1,674	0.20	1.9	37.62	2.5	663	39.61	1	–
0.25 to <0.50	1,209	1,377	75.00	1,116	0.38	2.4	29.01	2.5	515	46.18	1	–
0.50 to <0.75	500	491	75.00	434	0.67	1.4	27.28	2.5	243	55.98	1	–
0.75 to <2.50	413	360	75.00	304	1.47	0.6	23.60	2.5	199	65.39	1	–
2.50 to <10.00	96	85	75.00	79	4.46	0.1	15.06	2.5	57	71.37	1	–
10.00 to <100.00	30	26	74.18	31	15.08	0.1	35.51	2.5	59	190.30	2	–
100.00 (Default)	66	15	75.00	66	100.00	0.1	41.62	2.5	0	0	28	–
<b>Sub-total</b>	<b>5,405</b>	<b>5,041</b>	<b>75.00</b>	<b>5,651</b>	<b>0.67</b>	<b>13.4</b>	<b>27.28</b>	<b>2.5</b>	<b>1,998</b>	<b>35.35</b>	<b>34</b>	<b>40</b>
Dilution risk	3,709	5,465	4.81	3,767	0.17	11.5	75.00	1.0	901	23.91	5	0
<b>Sub-total incl. dilution risk</b>	<b>9,113</b>	<b>10,506</b>	<b>38.49</b>	<b>9,418</b>	<b>0.47</b>	<b>24.8</b>	<b>46.36</b>	<b>1.9</b>	<b>2,898</b>	<b>30.78</b>	<b>39</b>	<b>40</b>
<b>All exposure classes</b>												
Dilution risk	4,072	8,509	6.52	4,345	0.16	56.7	75.00	1.0	999	22.99	5	0
<b>Total incl. dilution risk</b>	<b>9,597</b>	<b>13,620</b>	<b>10.84</b>	<b>10,115</b>	<b>1.39</b>	<b>70.3</b>	<b>47.50</b>	<b>1.8</b>	<b>3,044</b>	<b>30.09</b>	<b>58</b>	<b>55</b>

Jun 30, 2019												
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
<b>Central governments and central banks</b>												
0.00 to <0.15	4	7	0	4	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	–
<b>Sub-total</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>&lt;0.1</b>	<b>12.33</b>	<b>2.5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>&lt;0.1</b>	<b>12.33</b>	<b>2.5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Institutions</b>												
0.00 to <0.15	0	3	0	0	0.06	<0.1	15.10	2.5	0	11.31	0	–
0.15 to <0.25	0	0	0	0	0.23	<0.1	42.69	2.5	0	47.60	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	1.23	<0.1	42.69	2.5	0	99.69	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	20.00	<0.1	45.00	2.5	1	286.68	0	–
100.00 (Default)	0	0	0	0	0	0	0	0	0	0	0	–
<b>Sub-total</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>14.60</b>	<b>&lt;0.1</b>	<b>37.81</b>	<b>2.5</b>	<b>1</b>	<b>213.60</b>	<b>0</b>	<b>0</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>14.60</b>	<b>&lt;0.1</b>	<b>37.81</b>	<b>2.5</b>	<b>1</b>	<b>213.60</b>	<b>0</b>	<b>0</b>
<b>Corporates</b>												
0.00 to <0.15	1,471	1,342	0	1,955	0.07	7.2	15.51	2.5	242	12.36	0	–
0.15 to <0.25	1,566	1,187	74.43	1,585	0.20	2.1	38.18	2.5	651	41.06	1	–
0.25 to <0.50	989	1,155	74.98	913	0.38	2.4	33.75	2.5	465	50.97	1	–
0.50 to <0.75	483	515	75.00	384	0.68	1.4	32.46	2.5	248	64.64	1	–
0.75 to <2.50	353	403	75.00	266	1.44	0.6	22.38	2.5	166	62.63	1	–
2.50 to <10.00	87	75	75.00	74	4.67	0.1	20.75	2.5	55	74.66	1	–
10.00 to <100.00	33	57	73.28	54	17.01	0.1	32.57	2.5	100	185.68	3	–
100.00 (Default)	105	9	100.00	105	100.00	0.1	43.09	2.5	0	0	45	–
<b>Sub-total</b>	<b>5,088</b>	<b>4,744</b>	<b>73.28</b>	<b>5,336</b>	<b>17.01</b>	<b>14.0</b>	<b>32.57</b>	<b>2.5</b>	<b>1,928</b>	<b>36.12</b>	<b>53</b>	<b>76</b>
Dilution risk	3,484	8,365	6.45	3,764	0.13	58.3	75.00	1.0	832	22.11	4	0
<b>Sub-total incl. dilution risk</b>	<b>8,572</b>	<b>13,109</b>	<b>30.63</b>	<b>9,100</b>	<b>10.03</b>	<b>72.3</b>	<b>50.12</b>	<b>1.9</b>	<b>2,760</b>	<b>30.33</b>	<b>57</b>	<b>76</b>

in € m.												Jun 30, 2019
(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
<b>of which:</b>												
<b>SMEs</b>												
0.00 to <0.15	0	0	0	0	0.07	<0.1	12.33	2.5	0	5.34	0	–
0.15 to <0.25	17	9	75.00	20	0.23	<0.1	42.94	2.5	7	35.01	0	–
0.25 to <0.50	26	18	75.00	24	0.38	<0.1	41.51	2.5	13	53.83	0	–
0.50 to <0.75	8	7	75.00	9	0.69	<0.1	34.99	2.5	4	45.31	0	–
0.75 to <2.50	6	11	0	6	1.40	<0.1	26.72	2.5	3	53.56	0	–
2.50 to <10.00	13	9	75.00	14	3.92	<0.1	35.61	2.5	10	67.95	0	–
10.00 to <100.00	1	2	75.00	1	18.83	<0.1	31.44	2.5	1	128.49	0	–
100.00 (Default)	36	0	0	36	100.00	<0.1	44.77	2.5	0	0	16	–
<b>Sub-total</b>	<b>107</b>	<b>56</b>	<b>75.00</b>	<b>111</b>	<b>33.63</b>	<b>0.1</b>	<b>40.67</b>	<b>2.5</b>	<b>38</b>	<b>34.18</b>	<b>17</b>	<b>22</b>
Dilution risk	311	3,083	7.10	526	0.12	45.1	75.00	1.0	111	21.10	0	0
<b>Sub-total incl. dilution risk</b>	<b>418</b>	<b>3,139</b>	<b>8.31</b>	<b>637</b>	<b>5.96</b>	<b>45.3</b>	<b>69.01</b>	<b>1.3</b>	<b>149</b>	<b>23.38</b>	<b>17</b>	<b>22</b>
<b>Specialized Lending</b>												
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	–
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>
Dilution risk	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sub-total incl. dilution risk</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>
<b>Other</b>												
0.00 to <0.15	1,471	1,342	0	1,955	0.07	7.2	15.51	2.5	242	12.36	0	–
0.15 to <0.25	1,549	1,179	74.41	1,565	0.20	2.1	38.12	2.5	644	41.13	1	–
0.25 to <0.50	963	1,137	74.98	888	0.38	2.4	33.53	2.5	452	50.89	1	–
0.50 to <0.75	475	508	75.00	375	0.68	1.4	32.40	2.5	244	65.13	1	–
0.75 to <2.50	347	392	75.00	260	1.45	0.6	22.28	2.5	163	62.83	1	–
2.50 to <10.00	74	66	75.00	60	4.84	0.1	17.26	2.5	46	76.24	0	–
10.00 to <100.00	33	55	73.28	53	16.99	0.1	32.58	2.5	99	186.33	3	–
100.00 (Default)	69	9	100.00	69	100.00	0.1	42.20	2.5	0	0	29	–
<b>Sub-total</b>	<b>4,980</b>	<b>4,688</b>	<b>75.00</b>	<b>5,225</b>	<b>0.68</b>	<b>13.9</b>	<b>32.40</b>	<b>2.5</b>	<b>1,890</b>	<b>36.16</b>	<b>37</b>	<b>45</b>
Dilution risk	3,174	5,282	4.94	3,238	0.13	13.2	75.00	1.0	721	22.27	3	0
<b>Sub-total incl. dilution risk</b>	<b>8,154</b>	<b>9,970</b>	<b>37.88</b>	<b>8,463</b>	<b>0.47</b>	<b>27.1</b>	<b>48.70</b>	<b>1.9</b>	<b>2,611</b>	<b>30.85</b>	<b>40</b>	<b>45</b>
<b>All exposure classes</b>												
Dilution risk	3,484	8,365	6.45	3,764	0.13	58.3	75.00	1.0	832	22.11	4	0
<b>Total incl. dilution risk</b>	<b>8,576</b>	<b>13,119</b>	<b>10.66</b>	<b>9,104</b>	<b>1.51</b>	<b>72.3</b>	<b>47.26</b>	<b>1.9</b>	<b>2,761</b>	<b>30.32</b>	<b>57</b>	<b>76</b>



## Article 453 (j) 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, 2019		Jun 30, 2019	
	a	b	a	b
	pre-credit derivatives RWA	Actual RWA	pre-credit derivatives RWA	Actual RWA
<b>7 Exposures under AIRB</b>				
8 Central governments and central banks	16,233	16,233	16,274	16,274
9 Institutions	3,918	3,979	4,399	4,445
9a Corporates	83,504	82,316	85,674	84,757
of which:				
10 SMEs	7,261	7,261	6,285	6,285
11 Specialized lending	7,607	7,607	8,914	8,914
12 Other	68,636	67,448	70,475	69,558
12a Retail	48,007	48,007	46,340	46,340
of which:				
13 Secured by real estate property SMEs	929	929	952	952
14 Secured by real estate property non-SMEs	27,294	27,294	25,970	25,970
15 Qualifying revolving	1,083	1,083	1,090	1,090
16 Other retail SMEs	1,916	1,916	2,059	2,059
17 Other retail non-SMEs	16,785	16,785	16,270	16,270
18 Equity	9,109	9,109	9,126	9,126
19 Other non-credit obligation asset	6,079	6,079	7,417	7,417
<b>19a Sub-total AIRB</b>	<b>166,850</b>	<b>165,723</b>	<b>169,230</b>	<b>168,358</b>
<b>1 Exposures under FIRB</b>				
2 Central governments and central banks	0	0	0	0
3 Institutions	0	0	1	1
3a Corporates	3,970	3,970	3,727	3,727
of which:				
4 SMEs	145	145	149	149
5 Specialized lending	926	926	967	967
6 Other	2,898	2,898	2,611	2,611
<b>6a Sub-total FIRB</b>	<b>3,970</b>	<b>3,970</b>	<b>3,728</b>	<b>3,728</b>
<b>20 Total</b>	<b>170,820</b>	<b>169,693</b>	<b>172,958</b>	<b>172,086</b>

Our RWA in the IRB approach were at € 169.7 billion as of December 31, 2019, compared to € 172.1 billion as of June 30, 2019. The overall decrease of € 2.4 billion is mainly driven by the corporates portfolio by € 2.5 billion, mostly resulting from further wind-down of our Capital Release Unit. Moreover, other non-credit obligation assets decreased by € 1.3 billion partly offset by our RWA within the retail portfolio, mainly in our Private Bank as a result of business growth and parameter updates.

## 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, 2019		Three months ended Sep 30, 2019	
	a	b	a	b
	RWA	Capital requirements	RWA	Capital requirements
1 Credit risk RWA opening balance	150,838	12,067	151,842	12,147
2 Book size	568	45	(1,691)	(135)
3 Book quality	(722)	(58)	(2,157)	(173)
4 Model updates	(250)	(20)	624	50
5 Methodology and policy	0	0	0	0
6 Acquisitions and disposals	0	0	0	0
7 Foreign exchange movements	(1,321)	(106)	2,220	178
8 Other	0	0	0	0
9 Credit risk RWA closing balance	149,113	11,929	150,838	12,067

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 decrease in RWA for credit risk exposures under the IRB approach by 1.2 % or € 1.8 billion since September 30, 2019 is primarily impacted by the decrease in the category “Book quality” stemming from favorable parameter recalibrations and data enhancements, along with FX related credit risk RWA decreases and updates shown in the category “Model updates”. This was partly offset by the category “Book size” as a result of business growth in our core business segments.

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

### Advanced IRBA – Model validation results

The validation reviews conducted in 2019 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 indicated to impact our regulatory capital requirements in a progressive way.

#### Validation results for risk parameters used in our advanced IRBA

	PD		LGD		2019 EAD	
	Count	EAD in %	Count	EAD in %	Count	EAD in %
	Appropriate	86	81.7	134	88.1	71
Overly conservative	10	13.6	29	9.9	15	19.4
Progressive	18	4.8	20	2.0	7	0.8
<b>Total</b>	<b>114</b>	<b>100.0</b>	<b>183</b>	<b>100.0</b>	<b>93</b>	<b>100.0</b>

Of which already recalibrated and introduced in 2019

Overly conservative	0	0.0	20	3.0	2	15.0
Progressive	0	0.0	7	0.6	3	0.1
<b>Total</b>	<b>0</b>	<b>0.0</b>	<b>27</b>	<b>3.7</b>	<b>5</b>	<b>15.1</b>

	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
<b>Total</b>	<b>120</b>	<b>100.0</b>	<b>186</b>	<b>100.0</b>	<b>85</b>	<b>100.0</b>

Of which already recalibrated and introduced in 2018

Overly conservative	2	0.3	11	1.9	0	0.0
Progressive	0	0.0	3	0.3	0	0.0
<b>Total</b>	<b>2</b>	<b>0.3</b>	<b>14</b>	<b>2.2</b>	<b>0</b>	<b>0.0</b>

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 of parameters as well as by the relative EAD attached to the respective parameter as of December 31, 2019 and December 31, 2018.

The validations during 2019 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 3.8 % of EAD and for which the PD was classified as too progressive recalibration is planned for yearend 2020. For the third rating system four PD parameters contributing to 2.9 % of EAD were classified as overly conservative and the overhaul was already performed and implemented in 2019. Validations furthermore classified one LGD parameter of Deutsche Bank contributing around 5.9 % of EAD as overly conservative. For another LGD parameter of Deutsche Bank contributing around 3.2 % of EAD with various settings classified as overly conservative and too progressive recalibration was already performed and implemented. One EAD parameter contributing 14.8 % of EAD was classified as overly conservative and recalibrated setting was already implemented after 2019 validation. All other negatively validated parameters are only applied to smaller portfolios and according remediation process is ongoing. Overall, out of the 99 risk parameters, where a recalibration was triggered during 2019 validation, 32 were already amended in 2019. EBA IRBA Repair Programme related model overhauls currently in preparation will cover further PD, LGD and CCF parameters validated as inappropriate.

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, 2019

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 (in %)
<b>Central governments and central banks</b>								
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-	1.63	1.43	<0.1	<0.1	0	0	1.03
2.50 to <10.00	BB- to B-	4.29	5.06	<0.1	<0.1	0	0	0.00
10.00 to <100.00	B- to CCC-	13.00	13.00	<0.1	<0.1	1	0	17.55
100.00 (Default)	CCC- to D	100.00	100.00	<0.1	<0.1	0	0	N/M
<b>Sub-total</b>	<b>N/M</b>	<b>0.08</b>	<b>2.29</b>	<b>0.4</b>	<b>0.4</b>	<b>1</b>	<b>0</b>	<b>0.54</b>
<b>Institutions</b>								
0.00 to <0.15	AAA to BBB+	0.05	0.07	0.7	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	0	0	0.00
0.50 to <0.75	BBB- to BB+	0.64	0.65	0.1	0.1	0	0	0.00
0.75 to <2.50	BB+ to BB-	1.43	1.39	0.1	0.1	1	0	0.40
2.50 to <10.00	BB- to B-	3.47	4.89	<0.1	<0.1	0	0	1.70
10.00 to <100.00	B- to CCC-	13.29	15.50	<0.1	<0.1	0	0	2.87
100.00 (Default)	CCC- to D	100.00	N/M	0	0	0	0	0.00
<b>Sub-total</b>	<b>N/M</b>	<b>0.39</b>	<b>1.45</b>	<b>1.1</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>0.20</b>
<b>Corporates</b>								
0.00 to <0.15	AAA to BBB+	0.07	0.08	27.4	25.9	6	0	0.03
0.15 to <0.25	BBB+ to BBB	0.23	0.25	6.1	6.1	14	1	0.11
0.25 to <0.50	BBB to BBB-	0.39	0.44	5.9	5.7	12	3	0.25
0.50 to <0.75	BBB- to BB+	0.65	0.72	5.0	5.0	28	3	0.38
0.75 to <2.50	BB+ to BB-	1.44	1.52	6.7	6.5	485	402	0.90
2.50 to <10.00	BB- to B-	4.85	4.97	3.5	3.4	132	6	2.59
10.00 to <100.00	B- to CCC-	17.64	20.33	0.9	0.7	71	0	9.31
100.00 (Default)	CCC- to D	100.00	100.00	0.1	0.1	6	5	42.86
<b>Sub-total</b>	<b>N/M</b>	<b>4.56</b>	<b>4.11</b>	<b>55.5</b>	<b>53.4</b>	<b>754</b>	<b>420</b>	<b>0.50</b>
<b>of which:</b>								
<b>SMEs</b>								
0.00 to <0.15	AAA to BBB+	0.10	0.11	5.6	6.1	1	0	0.08
0.15 to <0.25	BBB+ to BBB	0.25	0.29	2.0	2.3	3	0	0.17
0.25 to <0.50	BBB to BBB-	0.42	0.50	2.1	2.3	3	0	0.34
0.50 to <0.75	BBB- to BB+	0.70	0.83	1.8	1.8	10	0	0.57
0.75 to <2.50	BB+ to BB-	1.47	1.77	2.2	2.4	30	0	1.33
2.50 to <10.00	BB- to B-	4.57	5.39	1.0	1.1	57	0	3.31
10.00 to <100.00	B- to CCC-	20.90	22.68	0.2	0.2	23	0	8.32
100.00 (Default)	CCC- to D	100.00	100.00	<0.1	<0.1	1	0	75.00
<b>Sub-total</b>	<b>N/M</b>	<b>3.05</b>	<b>2.50</b>	<b>15.0</b>	<b>16.2</b>	<b>128</b>	<b>0</b>	<b>0.95</b>
<b>Specialized lending</b>								
0.00 to <0.15	AAA to BBB+	0.09	0.09	0.1	1.5	0	0	0.00
0.15 to <0.25	BBB+ to BBB	0.22	0.22	0.1	0.3	0	0	0.33
0.25 to <0.50	BBB to BBB-	0.39	0.39	0.1	0.3	0	0	0.00
0.50 to <0.75	BBB- to BB+	0.65	0.66	0.1	0.2	0	0	0.00
0.75 to <2.50	BB+ to BB-	1.48	1.49	0.3	0.2	0	0	1.71
2.50 to <10.00	BB- to B-	5.31	5.06	0.3	0.1	4	0	5.28
10.00 to <100.00	B- to CCC-	16.58	17.60	0.2	<0.1	1	0	17.86
100.00 (Default)	CCC- to D	100.00	100.00	<0.1	<0.1	0	0	N/M
<b>Sub-total</b>	<b>N/M</b>	<b>9.49</b>	<b>14.25</b>	<b>1.2</b>	<b>2.5</b>	<b>5</b>	<b>0</b>	<b>2.40</b>

		Dec 31, 2019						
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 (in %)
<b>Other</b>								
0.00 to <0.15	AAA to BBB+	0.07	0.06	21.6	18.2	5	0	0.03
0.15 to <0.25	BBB+ to BBB	0.23	0.23	4.0	3.5	11	1	0.10
0.25 to <0.50	BBB to BBB-	0.39	0.39	3.7	3.2	9	3	0.23
0.50 to <0.75	BBB- to BB+	0.64	0.65	3.1	3.0	18	3	0.33
0.75 to <2.50	BB+ to BB-	1.43	1.36	4.2	3.9	455	402	0.79
2.50 to <10.00	BB- to B-	4.55	4.67	2.1	2.2	71	6	2.28
10.00 to <100.00	B- to CCC-	19.62	19.99	0.4	0.5	47	0	9.77
100.00 (Default)	CCC- to D	100.00	100.00	0.1	0.1	5	5	11.11
<b>Sub-total</b>	<b>N/M</b>	<b>3.89</b>	<b>4.52</b>	<b>39.3</b>	<b>34.7</b>	<b>621</b>	<b>420</b>	<b>0.41</b>
<b>Retail</b>								
0.00 to <0.15	AAA to BBB+	0.10	0.09	1,362.8	1,327.3	632	9	0.04
0.15 to <0.25	BBB+ to BBB	0.22	0.23	626.9	592.8	883	37	0.11
0.25 to <0.50	BBB to BBB-	0.39	0.41	603.0	595.0	1,520	99	0.20
0.50 to <0.75	BBB- to BB+	0.69	0.69	624.4	624.1	2,633	253	0.36
0.75 to <2.50	BB+ to BB-	1.23	1.57	1,178.5	1,206.3	14,034	3,438	0.95
2.50 to <10.00	BB- to B-	4.51	4.39	669.1	734.5	26,178	2,660	2.97
10.00 to <100.00	B- to CCC-	20.81	20.98	149.0	144.5	31,719	531	18.64
100.00 (Default)	CCC- to D	100.00	100.00	82.2	71.4	4,133	88	20.01
<b>Sub-total</b>	<b>N/M</b>	<b>2.88</b>	<b>4.58</b>	<b>5,296.0</b>	<b>5,295.9</b>	<b>81,732</b>	<b>7,115</b>	<b>1.26</b>
<b>of which:</b>								
<b>Secured by real estate property</b>								
0.00 to <0.15	AAA to BBB+	0.11	0.10	196.6	185.7	141	1	0.06
0.15 to <0.25	BBB+ to BBB	0.22	0.22	248.6	243.5	253	1	0.09
0.25 to <0.50	BBB to BBB-	0.40	0.40	258.1	255.7	471	2	0.17
0.50 to <0.75	BBB- to BB+	0.69	0.69	236.4	231.8	635	9	0.24
0.75 to <2.50	BB+ to BB-	1.93	1.50	199.7	192.0	910	15	0.41
2.50 to <10.00	BB- to B-	4.70	4.63	90.2	82.9	1,379	2	1.46
10.00 to <100.00	B- to CCC-	20.95	21.06	17.2	14.8	2,317	1	13.25
100.00 (Default)	CCC- to D	100.00	100.00	9.3	9.4	576	4	13.33
<b>Sub-total</b>	<b>N/M</b>	<b>1.76</b>	<b>2.20</b>	<b>1,256.1</b>	<b>1,215.6</b>	<b>6,682</b>	<b>35</b>	<b>0.54</b>
<b>Qualifying revolving</b>								
0.00 to <0.15	AAA to BBB+	0.08	0.08	881.2	875.6	322	0	0.03
0.15 to <0.25	BBB+ to BBB	0.23	0.25	126.9	121.6	304	1	0.14
0.25 to <0.50	BBB to BBB-	0.37	0.42	107.1	103.0	490	15	0.27
0.50 to <0.75	BBB- to BB+	0.64	0.70	102.5	102.6	665	81	0.44
0.75 to <2.50	BB+ to BB-	1.45	1.49	133.9	134.0	2,180	248	1.31
2.50 to <10.00	BB- to B-	4.74	4.85	83.9	85.0	4,333	290	3.64
10.00 to <100.00	B- to CCC-	22.44	21.03	13.5	14.3	3,003	69	17.58
100.00 (Default)	CCC- to D	100.00	100.00	23.9	19.4	258	13	0.00
<b>Sub-total</b>	<b>N/M</b>	<b>1.03</b>	<b>3.20</b>	<b>1,472.9</b>	<b>1,455.5</b>	<b>11,555</b>	<b>717</b>	<b>0.66</b>
<b>Other</b>								
0.00 to <0.15	AAA to BBB+	0.09	0.09	285.0	266.1	176	8	0.06
0.15 to <0.25	BBB+ to BBB	0.18	0.23	251.7	227.8	355	35	0.12
0.25 to <0.50	BBB to BBB-	0.40	0.41	237.7	236.2	596	82	0.21
0.50 to <0.75	BBB- to BB+	0.68	0.69	285.4	289.7	1,401	163	0.42
0.75 to <2.50	BB+ to BB-	1.58	1.59	844.8	880.3	10,966	3,175	1.04
2.50 to <10.00	BB- to B-	4.18	4.26	495.1	566.6	20,471	2,368	3.18
10.00 to <100.00	B- to CCC-	20.55	21.13	118.2	115.4	26,399	461	19.85
100.00 (Default)	CCC- to D	100.00	100.00	49.1	42.6	3,567	71	21.19
<b>Sub-total</b>	<b>N/M</b>	<b>7.52</b>	<b>6.18</b>	<b>2,567.0</b>	<b>2,624.8</b>	<b>63,931</b>	<b>6,363</b>	<b>1.99</b>

		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 (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 %)
<b>Central governments and central banks</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>0.13</b>	<b>3.03</b>	<b>0.4</b>	<b>0.4</b>	<b>1</b>	<b>0</b>	<b>0.40</b>
<b>Institutions</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>0.80</b>	<b>1.27</b>	<b>1.2</b>	<b>1.1</b>	<b>3</b>	<b>0</b>	<b>0.30</b>
<b>Corporates</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>3.43</b>	<b>3.11</b>	<b>58.9</b>	<b>55.6</b>	<b>716</b>	<b>419</b>	<b>0.48</b>
<b>of which:</b>								
<b>SMEs</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>4.60</b>	<b>2.62</b>	<b>15.5</b>	<b>15.1</b>	<b>143</b>	<b>9</b>	<b>1.17</b>
<b>Specialized lending</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>13.98</b>	<b>15.93</b>	<b>1.1</b>	<b>1.2</b>	<b>19</b>	<b>0</b>	<b>2.53</b>

		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 (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 %)
<b>Other</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>2.28</b>	<b>2.91</b>	<b>42.3</b>	<b>39.4</b>	<b>552</b>	<b>410</b>	<b>0.38</b>
<b>Retail</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>3.24</b>	<b>4.20</b>	<b>5,612.2</b>	<b>5,296.3</b>	<b>74,091</b>	<b>6,783</b>	<b>1.26</b>
<b>of which:</b>								
<b>Secured by real estate property</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>2.26</b>	<b>2.22</b>	<b>1,388.4</b>	<b>1,256.2</b>	<b>5,950</b>	<b>48</b>	<b>0.60</b>
<b>Qualifying revolving</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>0.93</b>	<b>2.62</b>	<b>1,628.7</b>	<b>1,473.0</b>	<b>12,786</b>	<b>727</b>	<b>0.69</b>
<b>Other</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>8.61</b>	<b>5.68</b>	<b>2,595.0</b>	<b>2,567.1</b>	<b>56,203</b>	<b>6,008</b>	<b>1.97</b>

## Foundation IRBA – Model validation results

The below table summarizes the outcome of the model validations for the risk parameter PD solely used in our foundation IRBA for DB PFK AG on the ex Postbank portfolio. Validation results of PD parameters also used in the advanced IRBA were already shown in the overview of advanced IRBA parameters but may also be used for foundation IRBA exposures as e.g. factoring. 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, 2019 and as of December 31, 2018.

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

	2019		PD 2018	
	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
<b>Total</b>	<b>1</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>
<b>Of which already recalibrated and introduced</b>		<b>in 2019</b>		<b>in 2018</b>
Overly conservative	0	0.0	0	0.0
Progressive	0	0.0	0	0.0
<b>Total</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>

The performed analyses classify the PD parameter setting for the foundation IRBA relevant rating system of DB PFK AG on the former 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, 2019

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 de- fault rate (in %)
<b>Central governments and central banks</b>								
0.00 to <0.15	AAA to BBB+	0.00	0.00	<0.1	<0.1	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
<b>Sub-total</b>	<b>N/M</b>	<b>0.00</b>	<b>0.00</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>0</b>	<b>0</b>	<b>0.00</b>
<b>Institutions</b>								
0.00 to <0.15	AAA to BBB+	0.08	0.07	<0.1	<0.1	0	0	0.00
0.15 to <0.25	BBB+ to BBB	0.21	0.19	<0.1	<0.1	0	0	0.00
0.25 to <0.50	BBB to BBB-	0.38	0.38	<0.1	0	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-	20.00	20.00	<0.1	0	0	0	0.00
100.00 (Default)	CCC- to D	0.00	0.00	0	0	0	0	0.00
<b>Sub-total</b>	<b>N/M</b>	<b>19.13</b>	<b>1.53</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>0</b>	<b>0</b>	<b>0.00</b>
<b>Corporates</b>								
0.00 to <0.15	AAA to BBB+	0.09	0.05	4.3	6.7	12	1	0.33
0.15 to <0.25	BBB+ to BBB	0.20	0.21	2.1	2.0	8	2	0.25
0.25 to <0.50	BBB to BBB-	0.33	0.37	2.7	2.5	8	1	0.13
0.50 to <0.75	BBB- to BB+	0.61	0.68	1.2	1.5	3	2	0.09
0.75 to <2.50	BB+ to BB-	1.25	1.24	0.7	0.6	10	4	0.45
2.50 to <10.00	BB- to B-	4.88	5.21	0.1	0.1	3	2	2.41
10.00 to <100.00	B- to CCC-	16.62	17.36	0.1	0.1	1	0	0.92
100.00 (Default)	CCC- to D	100.00	100.00	0.1	0.1	0	0	0.00
<b>Sub-total</b>	<b>N/M</b>	<b>1.81</b>	<b>1.37</b>	<b>11.2</b>	<b>13.5</b>	<b>45</b>	<b>12</b>	<b>0.22</b>
<b>of which:</b>								
<b>SMEs</b>								
0.00 to <0.15	AAA to BBB+	0.00	0.00	0	<0.1	0	0	0.00
0.15 to <0.25	BBB+ to BBB	0.21	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	0.38
0.50 to <0.75	BBB- to BB+	0.69	0.69	<0.1	<0.1	0	0	0.43
0.75 to <2.50	BB+ to BB-	1.26	1.40	<0.1	<0.1	1	0	2.32
2.50 to <10.00	BB- to B-	3.85	4.65	<0.1	<0.1	1	0	8.57
10.00 to <100.00	B- to CCC-	19.82	18.97	<0.1	<0.1	0	0	0.87
100.00 (Default)	CCC- to D	100.00	100.00	<0.1	<0.1	0	0	0.00
<b>Sub-total</b>	<b>N/M</b>	<b>5.39</b>	<b>7.63</b>	<b>0.2</b>	<b>0.2</b>	<b>2</b>	<b>0</b>	<b>1.01</b>
<b>Specialized lending</b>								
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
<b>Sub-total</b>	<b>N/M</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>
<b>Other</b>								
0.00 to <0.15	AAA to BBB+	0.09	0.05	4.3	6.7	12	1	0.33
0.15 to <0.25	BBB+ to BBB	0.20	0.21	2.0	1.9	8	2	0.26
0.25 to <0.50	BBB to BBB-	0.33	0.37	2.7	2.4	8	1	0.12
0.50 to <0.75	BBB- to BB+	0.61	0.68	1.2	1.4	3	2	0.08
0.75 to <2.50	BB+ to BB-	1.25	1.24	0.7	0.6	9	4	0.28
2.50 to <10.00	BB- to B-	4.88	5.23	0.1	0.1	3	2	1.30
10.00 to <100.00	B- to CCC-	16.61	17.34	0.1	0.1	1	0	0.81
100.00 (Default)	CCC- to D	100.00	100.00	0.1	0.1	0	0	0.00
<b>Sub-total</b>	<b>N/M</b>	<b>1.79</b>	<b>1.27</b>	<b>11.1</b>	<b>13.4</b>	<b>44</b>	<b>12</b>	<b>0.19</b>

									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)				
<b>Central governments and central banks</b>									
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	
<b>Sub-total</b>	<b>N/M</b>	<b>100.00</b>	<b>0.00</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	
<b>Institutions</b>									
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	
<b>Sub-total</b>	<b>N/M</b>	<b>0.14</b>	<b>2.75</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	
<b>Corporates</b>									
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	
<b>Sub-total</b>	<b>N/M</b>	<b>1.42</b>	<b>1.68</b>	<b>7.4</b>	<b>11.2</b>	<b>14</b>	<b>4</b>	<b>0.38</b>	
<b>of which:</b>									
<b>SMEs</b>									
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	
<b>Sub-total</b>	<b>N/M</b>	<b>0.61</b>	<b>2.44</b>	<b>0.2</b>	<b>0.2</b>	<b>1</b>	<b>0</b>	<b>1.31</b>	
<b>Specialized lending</b>									
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	
<b>Sub-total</b>	<b>N/M</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	
<b>Other</b>									
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	
<b>Sub-total</b>	<b>N/M</b>	<b>1.42</b>	<b>1.66</b>	<b>7.2</b>	<b>11.1</b>	<b>13</b>	<b>4</b>	<b>0.33</b>	

## 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, 2018	2019	Dec 31, 2017	2018	Dec 31, 2016	2017	Dec 31, 2015	2016	Dec 31, 2014	2015
	Expected loss	Actual loss	Expected loss <sup>1</sup>	Actual loss	Expected loss	Actual loss	Expected loss	Actual loss	Expected loss	Actual loss
Central governments and central banks	27	0	22	0	3	4	2	3	3	0
Institutions	17	0	13	0	16	0	12	0	12	0
Corporates	572	488	526	493	512	198	369	697	300	334
Retail exposures secured by real estate property	269	118	282	143	285	98	305	177	306	207
Qualifying revolving retail exposures	31	21	34	26	14	15	13	4	17	4
Other retail exposures	414	546	383	403	405	349	339	704	334	354
<b>Total expected loss and actual loss in the advanced IRBA</b>	<b>1,331</b>	<b>1,173</b>	<b>1,260</b>	<b>1,065</b>	<b>1,236</b>	<b>665</b>	<b>1,041</b>	<b>1,584</b>	<b>971</b>	<b>900</b>

<sup>1</sup> Expected loss numbers have been restated for Dec 31, 2017.

The actual loss in 2019 was lower than the expected loss mainly driven by Corporates exposures.

In 2018 the actual loss was lower than the expected loss mainly 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.	2019	2018	2017	2016	2015
Central governments and central banks	0	0	4	3	0
Institutions	0	0	0	0	0
Corporates	488	493	198	697	334
Retail exposures secured by real estate property	118	143	98	177	207
Qualifying revolving retail exposures	21	26	15	4	4
Other retail exposures	546	403	349	704	354
<b>Total actual loss by IRBA in the advanced IRBA</b>	<b>1,173</b>	<b>1,065</b>	<b>665</b>	<b>1,584</b>	<b>900</b>

The increase in actual loss in fiscal year 2019 was driven by Other retail exposures, largely reflecting higher charges in PCB International compared to prior year.

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, 2019

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
<b>Argentina</b>									
EAD net	23	4	208	0	1	23	1	4	244
Average LGD in %	50.00	14.21	42.59	N/M	18.10	46.37	44.05	26.36	42.88
Average PD in %	0.08	0.09	0.26	N/M	0.16	0.00	0.24	0.01	0.24
<b>Australia</b>									
EAD net	619	589	2,055	1	7	1	1	2	3,276
Average LGD in %	34.36	45.50	17.65	25.87	18.41	27.15	42.69	17.62	26.07
Average PD in %	0.02	0.27	13.67	0.14	2.05	0.45	0.84	1.59	8.73
<b>Austria</b>									
EAD net	51	99	725	4	41	7	4	14	945
Average LGD in %	49.96	19.52	35.89	12.70	15.09	11.84	41.94	22.21	69.65
Average PD in %	0.00	0.08	1.52	1.24	1.09	0.68	0.51	5.51	6.55
<b>Belgium</b>									
EAD net	807	991	1,578	0	31	4	4	7	3,421
Average LGD in %	51.03	42.03	30.71	14.11	18.28	13.94	42.72	31.42	65.42
Average PD in %	0.00	0.05	10.18	0.27	4.76	0.99	0.38	7.01	7.78
<b>Brazil</b>									
EAD net	192	583	678	0	3	1	1	2	1,460
Average LGD in %	50.00	27.36	46.34	N/M	23.35	28.20	42.54	48.39	39.24
Average PD in %	0.64	0.93	5.13	N/M	1.36	0.82	0.46	2.74	2.97
<b>Canada</b>									
EAD net	17	1,227	1,531	0	4	1	3	1	2,783
Average LGD in %	30.00	27.78	33.95	N/M	23.67	24.72	42.60	37.15	31.41
Average PD in %	0.04	0.04	2.42	N/M	0.82	1.05	2.08	5.86	1.41
<b>Chile</b>									
EAD net	0	0	364	0	0	0	1	1	367
Average LGD in %	N/M	50.00	42.77	N/M	12.42	30.45	47.90	11.71	42.82
Average PD in %	N/M	0.00	0.01	N/M	0.42	0.35	0.38	0.05	0.02
<b>China</b>									
EAD net	2,165	1,739	4,484	0	24	2	3	2	8,418
Average LGD in %	50.19	30.09	51.50	N/M	21.45	27.42	42.75	41.45	46.70
Average PD in %	0.00	0.15	0.60	N/M	0.58	1.05	0.47	1.53	0.36
<b>Colombia</b>									
EAD net	0	0	93	0	1	0	1	2	97
Average LGD in %	N/M	N/M	35.49	26.57	11.50	31.94	42.37	48.22	35.46
Average PD in %	N/M	N/M	0.07	0.00	0.01	0.21	6.25	0.02	0.15
<b>Czech Republic</b>									
EAD net	0	22	69	0	5	1	2	3	103
Average LGD in %	N/M	39.62	47.43	N/M	19.55	12.23	42.69	53.79	70.31
Average PD in %	N/M	0.07	0.43	N/M	0.57	2.79	0.53	24.39	7.99
<b>France</b>									
EAD net	344	1,329	4,913	1	59	10	18	77	6,749
Average LGD in %	52.13	37.00	31.94	6.35	15.72	15.55	43.04	16.43	69.38
Average PD in %	0.00	0.06	1.32	0.43	3.10	0.76	0.41	4.52	9.07
<b>Germany</b>									
EAD net	6,483	1,393	42,441	8,543	143,286	11,608	2,924	21,457	238,135
Average LGD in %	85.30	27.30	34.81	11.74	15.14	12.22	34.92	43.24	99.93
Average PD in %	1.25	0.20	2.68	1.53	1.46	0.95	2.39	6.25	9.11
<b>Greece</b>									
EAD net	0	3	376	0	3	1	0	3	386
Average LGD in %	N/M	38.14	10.75	16.67	19.73	23.64	N/M	24.33	11.33
Average PD in %	N/M	13.00	39.88	0.70	0.43	1.73	N/M	6.23	39.10
<b>Hong Kong</b>									
EAD net	450	547	5,146	0	13	0	0	1	6,158
Average LGD in %	50.00	41.27	19.21	3.80	17.11	31.88	41.83	26.33	23.42
Average PD in %	0.00	0.06	4.24	0.39	0.44	0.43	43.05	3.96	3.56
<b>Hungary</b>									
EAD net	235	2	123	0	3	1	1	3	369
Average LGD in %	50.00	45.06	44.54	N/M	16.79	15.13	42.69	53.95	49.01
Average PD in %	0.14	0.39	0.18	N/M	1.79	6.35	0.71	23.87	0.82
<b>India</b>									
EAD net	3,036	981	6,446	0	7	2	2	33	10,508
Average LGD in %	49.91	35.66	35.50	N/M	25.73	35.97	42.43	48.07	39.73
Average PD in %	0.23	0.63	4.91	N/M	1.50	2.87	0.52	1.70	3.15
<b>Indonesia</b>									
EAD net	631	0	1,317	0	1	0	2	1	1,952

Dec 31, 2019

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	N/M	37.00	N/M	8.66	30.92	42.69	42.16	41.20
Average PD in %	0.23	N/M	3.32	N/M	5.52	2.27	0.23	49.80	2.34
<b>Ireland</b>									
EAD net	0	128	6,229	0	22	0	1	209	6,590
Average LGD in %	N/M	20.99	43.82	N/M	18.96	26.50	42.43	95.93	49.88
Average PD in %	N/M	34.42	33.46	N/M	6.22	1.36	5.37	99.41	36.71
<b>Israel</b>									
EAD net	0	0	125	0	12	0	1	0	138
Average LGD in %	N/M	N/M	32.41	26.57	24.40	27.86	42.68	46.55	33.94
Average PD in %	N/M	N/M	1.19	0.14	4.48	1.66	0.94	4.74	1.80
<b>Italy (incl. San Marino)</b>									
EAD net	1,312	104	7,894	176	7,016	55	1,277	7,374	25,208
Average LGD in %	50.21	37.63	38.54	31.86	13.17	67.00	61.68	58.72	49.88
Average PD in %	0.14	1.43	6.79	32.41	4.63	5.39	10.22	10.02	10.64
<b>Japan</b>									
EAD net	8,760	259	1,131	0	5	1	1	0	10,156
Average LGD in %	50.04	48.63	18.73	N/M	13.33	24.40	42.69	43.82	46.51
Average PD in %	0.00	0.05	3.02	N/M	0.44	0.19	0.42	2.31	0.34
<b>Jersey</b>									
EAD net	0	0	1,089	0	0	0	0	0	1,089
Average LGD in %	N/M	N/M	23.88	N/M	13.30	N/M	N/M	38.84	23.88
Average PD in %	N/M	N/M	2.76	N/M	0.09	N/M	N/M	1.65	2.76
<b>Luxembourg</b>									
EAD net	0	211	6,907	9	41	1	0	332	7,501
Average LGD in %	N/M	46.61	18.97	24.45	19.81	17.44	36.13	49.61	55.24
Average PD in %	N/M	0.15	4.47	0.51	2.26	0.73	0.45	0.36	6.22
<b>Malaysia</b>									
EAD net	689	0	800	0	2	0	0	0	1,491
Average LGD in %	50.00	N/M	47.97	N/M	16.04	24.34	42.69	25.35	48.95
Average PD in %	0.07	N/M	0.22	N/M	0.53	0.25	0.65	2.75	0.22
<b>Mauritius</b>									
EAD net	0	0	210	0	0	0	0	0	210
Average LGD in %	N/M	N/M	16.99	N/M	17.52	34.83	N/M	48.37	17.01
Average PD in %	N/M	N/M	13.36	N/M	0.65	6.18	N/M	0.96	13.33
<b>Mexico</b>									
EAD net	138	95	670	0	2	1	1	5	911
Average LGD in %	50.00	36.35	41.67	N/M	15.20	29.31	42.69	18.11	42.25
Average PD in %	0.09	0.15	1.24	N/M	2.22	0.63	0.36	1.06	0.97
<b>Netherlands</b>									
EAD net	26	380	11,042	2	86	4	8	8	11,555
Average LGD in %	58.82	23.22	28.22	8.84	15.65	18.20	42.76	35.41	48.23
Average PD in %	0.00	0.26	4.30	0.49	2.13	1.42	0.60	8.17	6.81
<b>Pakistan</b>									
EAD net	41	0	117	0	1	0	0	3	162
Average LGD in %	50.00	N/M	31.26	N/M	17.00	37.17	42.69	48.06	36.18
Average PD in %	7.95	N/M	4.45	N/M	1.63	3.04	0.38	1.53	5.26
<b>Philippines</b>									
EAD net	100	0	536	0	0	0	0	0	637
Average LGD in %	50.00	N/M	39.35	N/M	16.40	17.44	46.05	54.17	41.08
Average PD in %	0.14	N/M	0.30	N/M	0.88	1.33	0.43	45.17	0.33
<b>Poland</b>									
EAD net	2,100	1	608	1	2,179	2	7	19	4,919
Average LGD in %	50.00	37.15	38.26	25.61	27.20	15.02	44.25	60.57	42.45
Average PD in %	0.05	0.12	1.97	0.74	3.03	7.64	1.09	30.55	2.84
<b>Portugal</b>									
EAD net	0	18	470	0	5	1	2	4	500
Average LGD in %	0.13	20.74	22.34	25.47	21.66	17.52	43.04	42.47	88.34
Average PD in %	0.64	7.43	0.30	0.23	4.68	1.89	0.55	3.49	19.23
<b>Romania</b>									
EAD net	2	46	10	0	1	0	1	3	64
Average LGD in %	5.00	47.26	49.41	N/M	13.42	25.50	53.14	53.13	49.36
Average PD in %	100.00	0.69	0.42	N/M	0.20	7.84	3.75	33.53	7.59
<b>Russian Federation</b>									
EAD net	742	0	565	0	23	1	3	7	1,341
Average LGD in %	50.00	N/M	47.08	N/M	22.99	32.78	42.76	16.57	48.30
Average PD in %	0.23	N/M	0.62	N/M	4.73	1.36	0.40	1.62	0.49
<b>Saudi Arabia</b>									

Dec 31, 2019

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
EAD net	516	372	802	0	2	0	0	2	1,695
Average LGD in %	45.42	27.49	22.81	N/M	20.85	29.38	42.69	49.64	30.80
Average PD in %	0.05	0.10	8.37	N/M	0.92	3.36	0.57	0.67	4.00
<b>Singapore</b>									
EAD net	2,625	196	6,433	0	13	1	0	2	9,271
Average LGD in %	50.00	37.09	15.26	N/M	16.78	24.88	42.62	12.17	25.58
Average PD in %	0.00	0.04	1.14	N/M	0.64	0.25	0.44	1.63	0.80
<b>South Africa</b>									
EAD net	147	106	335	0	4	1	1	2	595
Average LGD in %	50.00	59.17	11.03	27.06	18.78	25.67	42.64	46.69	29.83
Average PD in %	0.39	0.39	0.86	0.39	3.05	2.44	0.46	1.29	0.77
<b>South Korea</b>									
EAD net	2,271	1	1,933	0	2	0	1	0	4,209
Average LGD in %	49.93	50.00	41.56	N/M	19.53	27.31	42.69	47.13	46.10
Average PD in %	0.00	0.07	0.35	N/M	2.91	0.79	1.04	2.15	0.19
<b>Spain</b>									
EAD net	958	351	9,789	95	6,935	5	1,463	1,978	21,575
Average LGD in %	50.48	28.95	40.03	12.76	11.37	30.59	66.58	61.65	39.71
Average PD in %	0.56	0.12	28.17	10.81	3.38	2.84	7.19	22.99	19.85
<b>Sri Lanka</b>									
EAD net	94	0	115	0	0	0	0	0	209
Average LGD in %	50.00	N/M	42.66	N/M	N/M	23.31	N/M	47.74	45.97
Average PD in %	4.82	N/M	1.62	N/M	N/M	0.67	N/M	1.09	3.06
<b>Sweden</b>									
EAD net	0	596	1,230	0	20	1	4	2	1,854
Average LGD in %	N/M	31.76	27.07	N/M	21.15	16.11	42.70	47.79	62.31
Average PD in %	N/M	0.06	1.80	N/M	1.23	0.34	0.34	8.00	5.63
<b>Switzerland</b>									
EAD net	3,860	441	10,204	5	184	14	11	26	14,744
Average LGD in %	49.99	28.58	26.48	9.02	15.28	18.26	41.45	26.99	59.22
Average PD in %	0.00	0.06	7.49	1.18	2.24	0.65	0.42	7.11	9.48
<b>Taiwan</b>									
EAD net	569	0	465	0	1	0	0	9	1,044
Average LGD in %	50.00	N/M	18.67	7.37	21.52	23.59	42.69	49.68	36.02
Average PD in %	0.00	N/M	0.20	0.64	1.19	0.64	0.56	0.38	0.09
<b>Thailand</b>									
EAD net	662	0	1,123	0	1	1	0	1	1,788
Average LGD in %	50.00	N/M	39.58	N/M	22.22	15.63	42.69	25.57	43.46
Average PD in %	0.09	N/M	0.36	N/M	0.32	0.61	0.45	2.67	0.27
<b>Turkey</b>									
EAD net	125	1,471	525	0	3	1	1	3	2,129
Average LGD in %	49.99	10.89	50.22	N/M	20.43	28.31	42.78	41.97	23.05
Average PD in %	0.64	2.20	3.40	N/M	2.39	1.69	0.42	9.66	2.46
<b>Ukraine</b>									
EAD net	144	0	49	0	4	0	0	1	198
Average LGD in %	50.00	N/M	21.62	N/M	11.64	35.64	42.69	46.13	42.19
Average PD in %	7.95	N/M	69.66	N/M	1.37	2.30	0.23	0.00	23.14
<b>United Arab Emirates</b>									
EAD net	131	0	1,669	2	11	1	1	4	1,819
Average LGD in %	50.00	N/M	20.83	11.51	19.67	29.55	42.69	27.24	23.09
Average PD in %	0.00	N/M	0.23	0.37	4.49	0.43	0.56	3.95	0.36
<b>United Kingdom</b>									
EAD net	426	3,565	9,564	1	120	4	11	351	14,041
Average LGD in %	50.04	78.98	29.79	11.29	21.23	24.91	41.56	17.57	46.55
Average PD in %	0.00	0.19	11.14	0.71	3.48	1.22	0.99	94.48	11.72
<b>United States of America</b>									
EAD net	81,054	4,505	78,316	1	55	5	57	183	164,177
Average LGD in %	50.01	52.59	19.74	19.77	24.97	23.60	45.82	49.26	36.12
Average PD in %	0.00	0.26	3.12	0.64	2.55	0.68	0.28	1.15	1.60
<b>Vietnam</b>									
EAD net	64	0	310	0	1	0	0	0	376
Average LGD in %	50.00	N/M	44.28	N/M	27.79	34.27	42.69	37.95	45.21
Average PD in %	0.64	N/M	1.46	N/M	0.86	2.63	1.09	1.25	1.32
<b>Other</b>									
EAD net	2,759	538	19,169	0	65	12	20	86	22,649
Average LGD in %	49.63	40.70	16.02	N/M	19.32	29.41	43.34	21.40	24.32

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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
Average PD in %	1.19	3.74	4.14	N/M	5.26	2.71	4.68	2.19	4.99
of which:									
International Organizations									
EAD net	413	0	1	0	0	0	0	0	414
Average LGD in %	54.83	N/M	49.63	N/M	N/M	N/M	N/M	N/M	54.81
Average PD in %	0.01	N/M	1.06	N/M	N/M	N/M	N/M	N/M	0.01
<b>Total</b>	<b>125,369<sup>1</sup></b>	<b>22,894</b>	<b>252,982</b>	<b>8,841</b>	<b>160,308</b>	<b>11,759</b>	<b>5,841</b>	<b>32,224</b>	<b>620,217<sup>1</sup></b>

<sup>1</sup> 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
<b>Australia</b>									
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
<b>Austria</b>									
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
<b>Belgium</b>									
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
<b>Brazil</b>									
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
<b>Canada</b>									
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
<b>China</b>									
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
<b>Czech Republic</b>									
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
<b>France</b>									
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
<b>Germany</b>									
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
<b>Greece</b>									
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
<b>Hong Kong</b>									
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
<b>Hungary</b>									
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
<b>India</b>									
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
<b>Indonesia</b>									
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
<b>Ireland</b>									
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
<b>Israel</b>									
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
<b>Italy (incl. San Marino)</b>									
EAD net	1,437	186	6,867	182	7,510	52	1,171	6,839	24,244
Average LGD in %	50.42	30.26	41.70	30.18	12.79	66.76	60.92	58.67	38.86

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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 %	0.14	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									
EAD net	1,882	233	7,943	0	14	1	0	2	10,075

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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									
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

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
Total	124,865 <sup>1</sup>	25,551	232,339	9,167	155,768	12,126	5,708	30,571	596,094 <sup>1</sup>

<sup>1</sup> 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, 2019				Dec 31, 2018			
	Central governments and central banks	Institutions	Corporates	Total	Central governments and central banks	Institutions	Corporates	Total
<b>Argentina<sup>1</sup></b>								
EAD net	0	0	0	0	N/M	N/M	N/M	N/M
Average PD in %	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
<b>Australia</b>								
EAD net	0	0	5	5	0	0	5	5
Average PD in %	N/M	N/M	0.36	0.36	N/M	N/M	0.27	0.27
<b>Austria</b>								
EAD net	0	0	381	381	0	0	374	374
Average PD in %	N/M	0.09	0.27	0.27	N/M	0.11	0.40	0.40
<b>Belgium</b>								
EAD net	0	0	115	115	0	0	105	105
Average PD in %	N/M	N/M	0.27	0.27	N/M	N/M	0.17	0.17
<b>Brazil</b>								
EAD net	0	0	23	23	0	0	16	16
Average PD in %	N/M	N/M	1.97	1.97	N/M	N/M	1.62	1.62
<b>Canada</b>								
EAD net	0	0	16	16	0	0	25	25
Average PD in %	N/M	N/M	0.10	0.10	N/M	N/M	0.07	0.07
<b>Chile<sup>1</sup></b>								
EAD net	0	0	0	0	N/M	N/M	N/M	N/M
Average PD in %	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
<b>China</b>								
EAD net	0	0	38	38	0	0	42	42
Average PD in %	N/M	N/M	0.46	0.46	N/M	N/M	0.30	0.30
<b>Colombia<sup>1</sup></b>								
EAD net	0	0	0	0	N/M	N/M	N/M	N/M
Average PD in %	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
<b>Czech Republic</b>								
EAD net	0	0	84	84	0	0	47	47
Average PD in %	N/M	N/M	0.33	0.33	N/M	N/M	0.20	0.20
<b>France</b>								
EAD net	0	0	367	367	0	0	261	261
Average PD in %	N/M	N/M	0.23	0.23	N/M	N/M	0.28	0.28
<b>Germany</b>								
EAD net	0	0	6,983	6,983	17	1	6,335	6,353
Average PD in %	0.00	0.07	1.73	1.73	0.00	0.09	1.33	1.33
<b>Greece</b>								
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
<b>Hong Kong</b>								
EAD net	0	0	2	2	0	0	2	2
Average PD in %	N/M	N/M	0.37	0.37	N/M	N/M	0.17	0.17
<b>Hungary</b>								
EAD net	0	0	72	72	0	0	82	82
Average PD in %	N/M	N/M	0.16	0.16	N/M	N/M	0.11	0.11
<b>India</b>								
EAD net	0	0	48	48	0	0	57	57
Average PD in %	N/M	N/M	1.88	1.88	N/M	N/M	2.06	2.06
<b>Indonesia</b>								
EAD net	0	0	3	3	0	0	1	1
Average PD in %	N/M	N/M	0.08	0.08	N/M	N/M	0.06	0.06
<b>Ireland</b>								
EAD net	0	0	22	22	0	0	20	20
Average PD in %	N/M	N/M	0.24	0.24	N/M	N/M	0.21	0.21
<b>Israel</b>								
EAD net	0	0	7	7	0	0	4	4
Average PD in %	N/M	N/M	0.11	0.11	N/M	N/M	0.28	0.28
<b>Italy</b>								
EAD net	0	0	199	199	0	0	180	180
Average PD in %	N/M	N/M	0.40	0.40	N/M	N/M	0.80	0.80
<b>Japan</b>								
EAD net	0	0	11	11	0	0	6	6
Average PD in %	N/M	N/M	0.17	0.17	N/M	N/M	0.15	0.15
<b>Jersey</b>								
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

in € m. (unless stated otherwise)	Dec 31, 2019				Dec 31, 2018			
	Central governments and central banks	Institutions	Corporates	Total	Central governments and central banks	Institutions	Corporates	Total
<b>Luxembourg</b>								
EAD net	0	0	57	57	0	0	61	62
Average PD in %	N/M	N/M	0.06	0.06	N/M	20.00	0.14	0.25
<b>Malaysia</b>								
EAD net	0	0	4	4	0	0	5	5
Average PD in %	N/M	N/M	0.21	0.21	N/M	N/M	0.22	0.22
<b>Malta<sup>1</sup></b>								
EAD net	N/M	N/M	N/M	N/M	0	0	0	0
Average PD in %	N/M	N/M	N/M	N/M	N/M	N/M	0.17	0.17
<b>Mauritius</b>								
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	0.20	0.20
<b>Mexico</b>								
EAD net	0	0	9	9	0	0	9	9
Average PD in %	N/M	N/M	0.55	0.55	N/M	N/M	3.08	3.08
<b>Netherlands</b>								
EAD net	0	0	233	233	0	0	175	175
Average PD in %	N/M	N/M	0.17	0.17	N/M	N/M	0.40	0.40
<b>New Zealand<sup>1</sup></b>								
EAD net	N/M	N/M	N/M	N/M	0	0	4	4
Average PD in %	N/M	N/M	N/M	N/M	N/M	N/M	0.23	0.23
<b>Pakistan</b>								
EAD net	0	0	0	0	0	0	0	0
Average PD in %	N/M	N/M	0.06	0.06	N/M	N/M	N/M	N/M
<b>Philippines</b>								
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
<b>Poland</b>								
EAD net	0	0	123	123	0	0	120	120
Average PD in %	N/M	N/M	0.21	0.21	N/M	N/M	0.58	0.58
<b>Portugal</b>								
EAD net	0	0	24	24	0	0	17	17
Average PD in %	N/M	N/M	0.19	0.19	N/M	N/M	0.17	0.17
<b>Romania</b>								
EAD net	0	0	36	36	0	0	33	33
Average PD in %	N/M	N/M	0.13	0.13	N/M	N/M	0.15	0.15
<b>Russian Federation</b>								
EAD net	0	0	79	79	0	0	74	74
Average PD in %	N/M	N/M	1.10	1.10	N/M	N/M	1.96	1.96
<b>Saudi Arabia</b>								
EAD net	0	0	5	5	0	0	7	7
Average PD in %	N/M	N/M	0.08	0.08	N/M	N/M	0.15	0.15
<b>Singapore</b>								
EAD net	0	0	3	3	0	0	6	6
Average PD in %	N/M	N/M	3.44	3.44	N/M	N/M	0.43	0.43
<b>South Africa</b>								
EAD net	0	0	1	1	0	0	1	1
Average PD in %	N/M	N/M	7.09	7.09	N/M	N/M	0.18	0.18
<b>South Korea</b>								
EAD net	0	0	3	3	0	0	4	4
Average PD in %	N/M	N/M	0.26	0.26	N/M	N/M	0.35	0.35
<b>Spain</b>								
EAD net	0	0	121	121	0	0	127	127
Average PD in %	N/M	N/M	0.29	0.29	N/M	N/M	0.36	0.36
<b>Sri-Lanka</b>								
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
<b>Sweden</b>								
EAD net	0	0	35	35	0	0	41	41
Average PD in %	N/M	N/M	0.13	0.13	N/M	N/M	0.20	0.20
<b>Switzerland</b>								
EAD net	0	0	284	284	0	0	206	206
Average PD in %	N/M	N/M	0.17	0.17	N/M	N/M	0.23	0.23
<b>Taiwan</b>								
EAD net	0	0	4	4	0	0	3	3
Average PD in %	N/M	N/M	0.28	0.28	N/M	N/M	0.22	0.22
<b>Thailand</b>								
EAD net	0	0	8	8	0	0	13	13

	Dec 31, 2019				Dec 31, 2018			
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	0.14	0.14	N/M	N/M	0.16	0.16
Turkey								
EAD net	0	0	11	11	0	0	8	8
Average PD in %	N/M	N/M	0.15	0.15	N/M	N/M	0.24	0.24
Ukraine								
EAD net	0	0	8	8	0	0	6	6
Average PD in %	N/M	N/M	0.92	0.92	N/M	N/M	1.63	1.63
United Arab Emirates								
EAD net	0	0	7	7	0	0	6	6
Average PD in %	N/M	N/M	6.87	6.87	N/M	N/M	8.64	8.64
United Kingdom								
EAD net	0	0	199	199	0	0	258	258
Average PD in %	N/M	N/M	0.47	0.47	N/M	N/M	0.34	0.34
United States of America								
EAD net	0	0	250	250	0	0	223	223
Average PD in %	N/M	N/M	1.50	1.50	N/M	N/M	1.03	1.03
Vietnam								
EAD net	0	0	6	6	0	0	6	6
Average PD in %	N/M	N/M	2.30	2.30	N/M	N/M	9.96	9.96
Other								
EAD	0	0	224	224	0	15	246	261
Average PD in %	N/M	N/M	2.70	2.70	N/M	20.00	2.16	3.19
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
<b>Total</b>	<b>0</b>	<b>0</b>	<b>10,115</b>	<b>10,115</b>	<b>17</b>	<b>16</b>	<b>9,218</b>	<b>9,251</b>

<sup>1</sup> Due to materiality thresholds, this table includes these countries either for the first or last time. Therefore only one period is being reported.

# 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 2019 on pages 67. 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 2019 under sections: "Netting and collateral arrangements for derivatives and securities financing transactions", pages 75, "Derivatives - credit valuation adjustment", and "Treatment of default situations under derivatives", on pages 143 as well as "Credit exposure from derivatives", on page 130.



## 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 2019 section “Managing and mitigation of credit risk” in the sub-section “Netting and collateral arrangements for derivatives and securities financing transactions”, on page 75, “Derivatives – credit valuation adjustment”, page 143 as well as “Credit exposure from derivatives”, on page 130.

## 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 2019, section “Mitigation of credit risk on counterparty level” on page 73, “Treatment of default situations under derivatives” on page 143 and “Country risk management” on page 77.

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

For details please refer to the Annual Report 2019, section “Managing and mitigation of credit risk” in the sub-section “Netting and collateral arrangements for derivatives and securities financing transactions” on page 75. Additionally please refer to our Annual Report 2019 to the section “Liquidity risk exposure”, sub-section “Stress testing and scenario analysis” on page 154.

## 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 EU CCR2 and EU 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 future 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 2019 on page 128.

EU CCR1 – Analysis of CCR exposure by approach

							Dec 31, 2019
	a	b	c	d	e	f	g
in € m. (unless stated otherwise)	Notional	Replacement cost/ Current market value	Potential future credit exposure	EEPE	Multiplier	EAD post CRM	RWA
1 Mark-to-market	–	4,302	6,024	–	–	10,331	4,506
2 Original exposure	N/M	–	–	–	–	N/M	N/M
3 Standardized approach	–	N/M	–	–	N/M	N/M	N/M
4 IMM (for derivatives and SFTs)	–	–	–	60,588	1.2	72,705	16,708
of which:	–	–	–				
5 Securities Financing Transactions	–	–	–	31,786	1.2	38,143	3,026
6 Derivatives & Long Settlement Transactions	–	–	–	28,801	1.2	34,562	13,682
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)	–	–	–	–	–	10,143	1,822
10 VaR for SFTs	–	–	–	–	–	0	0
11 Total	–	–	–	–	–	–	23,036

							Jun 30, 2019
	a	b	c	d	e	f	g
in € m. (unless stated otherwise)	Notional	Replacement cost/ Current market value	Potential future credit exposure	EEPE	Multiplier	EAD post CRM	RWA
1 Mark-to-market	–	4,905	5,063	–	–	9,963	4,090
2 Original exposure	N/M	–	–	–	–	N/M	N/M
3 Standardized approach	–	N/M	–	–	N/M	N/M	N/M
4 IMM (for derivatives and SFTs)	–	–	–	88,479	1.2	106,175	18,639
of which:	–	–	–				
5 Securities Financing Transactions	–	–	–	57,546	1.2	69,055	4,303
6 Derivatives & Long Settlement Transactions	–	–	–	30,933	1.2	37,120	14,335
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)	–	–	–	–	–	20,056	2,699
10 VaR for SFTs	–	–	–	–	–	0	0
11 Total	–	–	–	–	–	–	25,428

Our RWA for counterparty credit risk were at € 23.0 billion as of December 31, 2019, compared to € 25.4 billion as of June 30, 2019. The decrease of € 2.4 billion was mainly driven by our exposures calculated according to the IMM in relation to the further wind-down of our Capital Release Unit.

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 movement in the advanced method, driving the reported CVA RWA of € 4.3 billion (93 %), whilst the standardized method covers only € 345 million (7 %) 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 methodology changes.

## EU CCR2 – CVA capital charge

in € m.	Dec 31, 2019		Jun 30, 2019	
	a	b	a	b
	Exposure value	RWA	Exposure value	RWA
1 Total portfolios subject to the Advanced Method	58,059	4,337	93,187	5,663
2 (i) VaR component (including the 3× multiplier)	–	969	–	781
3 (ii) Stressed VaR component (including the 3× multiplier)	–	3,368	–	4,882
4 All portfolios subject to the Standardized Method	904	345	1,619	556
EU4 Based on Original Exposure Method	0	0	0	0
5 Total subject to the CVA capital charge	58,963	4,683	94,807	6,219

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, 2019 and June 30, 2019, 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, 2019		Jun 30, 2019	
	a	b	a	b
	EAD post CRM	RWA	EAD post CRM	RWA
1 Exposures to QCCPs (total)	–	573	–	687
2 Exposures for trades at QCCPs (excluding initial margin and default fund contributions)	5,473	109	6,787	136
of which:				
3 (i) OTC derivatives	2,276	46	1,808	36
4 (ii) Exchange-traded derivatives	729	15	2,275	46
5 (iii) Securities financing transactions	2,468	49	2,704	54
6 (iv) Netting sets where cross-product netting has been approved	0	0	0	0
7 Segregated initial margin	4,746	–	5,453	–
8 Non-segregated initial margin	3,404	68	4,816	96
9 Pre-funded default fund contributions	915	395	986	454
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

in € m.		Dec 31, 2019						Risk Weight
		0%	2%	4%	10%	20%	50%	70%
Exposure classes								
1	Central governments or central banks	3,617	0	0	0	0	0	0
2	Regional governments or local authorities	188	0	0	0	0	0	0
3	Public sector entities	241	0	0	0	3	0	0
4	Multilateral development banks	562	0	0	0	0	0	0
5	International organizations	0	0	0	0	0	0	0
6	Institutions	0	8,703	0	0	63	4	0
7	Corporates	0	0	0	0	178	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	172	0	0	0	0	0
11	<b>Total</b>	<b>4,608</b>	<b>8,876</b>	<b>0</b>	<b>0</b>	<b>244</b>	<b>4</b>	<b>0</b>

in € m.		Dec 31, 2019					Total	Of which: unrated
		75%	100%	150%	Others			
Exposure classes								
1	Central governments or central banks	0	0	0	0	3,617	3,617	
2	Regional governments or local authorities	0	0	0	0	188	188	
3	Public sector entities	0	0	0	0	244	244	
4	Multilateral development banks	0	0	0	0	562	562	
5	International organizations	0	0	0	0	0	0	
6	Institutions	0	14	0	0	8,784	8,775	
7	Corporates	0	750	5	0	934	928	
8	Retail	3	0	0	0	3	3	
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	2	0	0	174	174	
11	<b>Total</b>	<b>3</b>	<b>766</b>	<b>5</b>	<b>0</b>	<b>14,506</b>	<b>14,490</b>	

in € m.		Jun 30, 2019						Risk Weight
		0%	2%	4%	10%	20%	50%	70%
Exposure classes								
1	Central governments or central banks	3,113	0	0	0	0	0	0
2	Regional governments or local authorities	218	0	0	0	0	0	0
3	Public sector entities	260	0	0	0	2	0	0
4	Multilateral development banks	745	0	0	0	0	0	0
5	International organizations	0	0	0	0	0	0	0
6	Institutions	0	13,181	0	0	78	2	0
7	Corporates	0	0	0	0	11	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	154	0	0	0	0	0
11	<b>Total</b>	<b>4,336</b>	<b>13,335</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>2</b>	<b>0</b>

		Jun 30, 2019					
in € m.		Risk Weight					
Exposure classes		75%	100%	150%	Others	Total	Of which: unrated
1	Central governments or central banks	0	0	0	0	3,113	3,113
2	Regional governments or local authorities	0	0	0	0	218	218
3	Public sector entities	0	0	0	0	262	262
4	Multilateral development banks	0	0	0	0	745	745
5	International organizations	0	0	0	0	0	0
6	Institutions	0	22	0	0	13,282	13,339
7	Corporates	0	898	0	0	909	865
8	Retail	3	0	0	0	3	3
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	19	0	0	174	168
11	Total	3	938	0	0	18,706	18,714

## 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, 2019

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 %)
<b>Central governments and central banks</b>							
0.00 to <0.15	7,100	0.02	0.1	45.49	0.9	317	4.47
0.15 to <0.25	617	0.23	<0.1	49.99	1.1	244	39.59
0.25 to <0.50	41	0.39	<0.1	45.00	4.4	36	86.70
0.50 to <0.75	77	0.64	<0.1	47.84	4.2	85	110.26
0.75 to <2.50	35	1.76	<0.1	30.00	5.0	35	100.45
2.50 to <10.00	888	2.92	<0.1	22.00	3.4	758	85.33
10.00 to <100.00	0	0	0	0	0	0	0
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>8,758</b>	<b>0.34</b>	<b>0.1</b>	<b>43.38</b>	<b>1.3</b>	<b>1,475</b>	<b>16.84</b>
<b>Institutions</b>							
0.00 to <0.15	18,196	0.05	0.4	38.03	1.3	2,902	15.95
0.15 to <0.25	183	0.23	0.1	47.42	2.3	119	64.82
0.25 to <0.50	520	0.39	<0.1	53.89	1.6	370	71.21
0.50 to <0.75	413	0.64	<0.1	56.68	1.1	381	92.12
0.75 to <2.50	294	1.51	<0.1	55.80	1.2	360	122.34
2.50 to <10.00	93	3.92	<0.1	51.93	2.4	190	204.09
10.00 to <100.00	16	13.86	<0.1	51.20	3.0	45	273.43
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>19,716</b>	<b>0.13</b>	<b>0.6</b>	<b>39.27</b>	<b>1.3</b>	<b>4,366</b>	<b>22.15</b>
<b>Corporates</b>							
0.00 to <0.15	47,231	0.04	8.8	35.69	1.3	6,050	12.81
0.15 to <0.25	1,923	0.19	0.7	30.38	2.7	856	44.55
0.25 to <0.50	1,809	0.13	0.8	34.14	1.4	1,626	89.86
0.50 to <0.75	1,991	0.50	0.8	39.07	2.5	1,804	90.62
0.75 to <2.50	3,343	1.26	1.1	43.79	2.7	3,490	104.40
2.50 to <10.00	1,847	4.35	0.5	26.54	3.7	1,774	96.07
10.00 to <100.00	597	15.69	0.1	12.67	1.0	421	70.52
100.00 (Default)	38	100.00	<0.1	20.84	1.5	30	78.62
<b>Sub-total</b>	<b>58,778</b>	<b>0.49</b>	<b>12.8</b>	<b>35.51</b>	<b>1.6</b>	<b>16,051</b>	<b>27.31</b>
<b>of which:</b>							
<b>SMEs</b>							
0.00 to <0.15	992	0.06	0.3	42.35	3.3	297	29.94
0.15 to <0.25	60	0.23	0.1	47.97	2.5	29	47.25
0.25 to <0.50	68	0.39	0.1	52.94	2.4	48	70.35
0.50 to <0.75	104	0.64	0.1	51.35	0.8	65	62.84
0.75 to <2.50	157	1.55	0.1	24.82	2.6	75	47.94
2.50 to <10.00	95	4.61	0.1	35.66	2.1	90	95.01
10.00 to <100.00	1	23.55	<0.1	42.63	4.3	3	198.39
100.00 (Default)	3	100.00	<0.1	34.90	1.6	5	166.74
<b>Sub-total</b>	<b>1,479</b>	<b>0.79</b>	<b>0.7</b>	<b>41.39</b>	<b>2.9</b>	<b>611</b>	<b>41.29</b>
<b>Specialized Lending</b>							
0.00 to <0.15	92	0.08	<0.1	52.29	4.4	42	45.17
0.15 to <0.25	27	0.23	<0.1	48.15	3.8	18	66.54
0.25 to <0.50	48	0.39	<0.1	37.15	4.1	33	68.29
0.50 to <0.75	33	0.64	<0.1	48.76	4.5	37	113.67
0.75 to <2.50	140	1.36	0.1	40.45	4.0	157	112.16
2.50 to <10.00	367	4.85	<0.1	19.47	4.9	293	79.74
10.00 to <100.00	23	13.56	<0.1	15.78	1.6	18	78.40
100.00 (Default)	4	100.00	<0.1	38.46	3.0	1	22.60
<b>Sub-total</b>	<b>733</b>	<b>3.70</b>	<b>0.2</b>	<b>31.09</b>	<b>4.4</b>	<b>598</b>	<b>81.51</b>
<b>Other</b>							
0.00 to <0.15	46,147	0.04	8.5	35.51	1.2	5,711	12.38
0.15 to <0.25	1,835	0.19	0.6	29.70	2.7	810	44.13
0.25 to <0.50	1,694	0.13	0.7	33.70	1.4	1,546	91.25
0.50 to <0.75	1,855	0.50	0.7	38.39	2.6	1,702	91.77
0.75 to <2.50	3,046	1.25	1.0	44.91	2.6	3,258	106.96
2.50 to <10.00	1,385	4.20	0.4	27.80	3.4	1,391	100.48
10.00 to <100.00	573	15.75	<0.1	12.47	0.9	400	69.90
100.00 (Default)	31	100.00	<0.1	17.38	1.3	24	77.18
<b>Sub-total</b>	<b>56,566</b>	<b>0.45</b>	<b>11.9</b>	<b>35.42</b>	<b>1.5</b>	<b>14,843</b>	<b>26.24</b>

Dec 31, 2019

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 %)
<b>Retail</b>							
0.00 to <0.15	6	0.06	0.2	49.46	1.5	1	8.74
0.15 to <0.25	3	0.23	<0.1	55.57	4.7	1	24.50
0.25 to <0.50	6	0.39	<0.1	68.88	5.8	2	39.42
0.50 to <0.75	9	0.64	0.1	71.17	1.7	5	58.21
0.75 to <2.50	17	1.40	0.1	71.02	2.6	13	78.76
2.50 to <10.00	11	4.92	0.1	75.26	1.4	12	107.29
10.00 to <100.00	3	26.52	<0.1	75.90	1.1	4	135.03
100.00 (Default)	1	100.00	<0.1	20.66	1.8	1	195.97
<b>Sub-total</b>	<b>55</b>	<b>4.13</b>	<b>0.5</b>	<b>67.99</b>	<b>2.5</b>	<b>39</b>	<b>70.51</b>
<b>of which:</b>							
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other retail SMEs							
0.00 to <0.15	0	0.11	<0.1	49.20	2.2	0	10.15
0.15 to <0.25	1	0.23	<0.1	68.84	1.2	0	25.59
0.25 to <0.50	3	0.39	<0.1	75.62	1.2	1	37.99
0.50 to <0.75	2	0.64	<0.1	74.21	1.2	1	49.33
0.75 to <2.50	6	1.49	0.1	72.02	1.6	4	67.84
2.50 to <10.00	4	4.23	<0.1	75.68	1.1	3	87.99
10.00 to <100.00	1	37.72	<0.1	75.90	1.2	1	114.82
100.00 (Default)	1	100.00	<0.1	20.66	1.8	1	195.97
<b>Sub-total</b>	<b>18</b>	<b>8.16</b>	<b>0.2</b>	<b>71.61</b>	<b>1.3</b>	<b>13</b>	<b>71.07</b>
Other retail non-SMEs							
0.00 to <0.15	6	0.06	0.1	49.47	1.4	1	8.70
0.15 to <0.25	2	0.23	<0.1	51.20	5.9	1	24.15
0.25 to <0.50	3	0.39	<0.1	62.00	10.6	1	40.88
0.50 to <0.75	6	0.64	<0.1	70.16	1.9	4	61.16
0.75 to <2.50	11	1.36	0.1	70.49	3.1	9	84.48
2.50 to <10.00	7	5.30	<0.1	75.03	1.6	8	117.91
10.00 to <100.00	1	16.56	<0.1	75.90	1.0	2	153.01
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>37</b>	<b>2.22</b>	<b>0.3</b>	<b>66.27</b>	<b>3.0</b>	<b>26</b>	<b>70.24</b>
<b>Total (all exposure classes)</b>	<b>87,307</b>	<b>0.41</b>	<b>14.1</b>	<b>37.97</b>	<b>1.5</b>	<b>21,931</b>	<b>25.12</b>

Jun 30, 2019

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 %)
<b>Central governments and central banks</b>							
0.00 to <0.15	6,152	0.02	0.1	40.96	1.1	354	5.75
0.15 to <0.25	494	0.23	<0.1	49.31	0.3	154	31.20
0.25 to <0.50	22	0.39	<0.1	50.00	4.5	22	99.48
0.50 to <0.75	9	0.64	<0.1	30.00	5.0	7	76.21
0.75 to <2.50	40	1.75	<0.1	30.00	5.0	40	100.55
2.50 to <10.00	1,536	4.00	<0.1	16.52	2.9	915	59.55
10.00 to <100.00	0	0	0	0	0	0	0
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>8,253</b>	<b>0.79</b>	<b>0.1</b>	<b>36.87</b>	<b>1.4</b>	<b>1,491</b>	<b>18.07</b>
<b>Institutions</b>							
0.00 to <0.15	17,983	0.06	0.5	41.58	1.0	3,133	17.42
0.15 to <0.25	241	0.23	<0.1	45.80	3.6	187	77.90
0.25 to <0.50	427	0.39	0.1	52.98	1.2	277	64.87
0.50 to <0.75	396	0.64	<0.1	54.88	1.2	378	95.48
0.75 to <2.50	502	1.41	<0.1	59.03	0.9	654	130.29
2.50 to <10.00	184	3.69	<0.1	29.72	1.9	178	96.73
10.00 to <100.00	17	14.16	<0.1	57.79	3.6	52	309.70
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>19,749</b>	<b>0.16</b>	<b>0.7</b>	<b>42.49</b>	<b>1.0</b>	<b>4,859</b>	<b>24.60</b>
<b>Corporates</b>							
0.00 to <0.15	84,479	0.04	10.1	33.55	0.7	7,053	8.35
0.15 to <0.25	2,693	0.23	0.7	28.05	2.9	968	35.95
0.25 to <0.50	3,796	0.39	0.8	33.65	1.7	1,895	49.93
0.50 to <0.75	3,761	0.64	0.9	29.74	1.5	1,980	52.65
0.75 to <2.50	3,683	1.30	1.2	40.87	2.6	3,591	97.51
2.50 to <10.00	1,760	4.63	0.5	31.29	3.2	1,985	112.76
10.00 to <100.00	571	15.22	0.1	10.89	1.1	333	58.41
100.00 (Default)	25	100.00	<0.1	22.48	2.3	17	70.01
<b>Sub-total</b>	<b>100,768</b>	<b>0.32</b>	<b>14.3</b>	<b>33.36</b>	<b>0.9</b>	<b>17,824</b>	<b>17.69</b>
<b>of which:</b>							
<b>SMEs</b>							
0.00 to <0.15	683	0.06	0.2	49.27	2.0	168	24.65
0.15 to <0.25	68	0.23	0.1	44.64	2.9	34	49.84
0.25 to <0.50	52	0.39	0.1	43.66	2.7	32	62.01
0.50 to <0.75	114	0.64	0.1	50.38	0.5	57	50.19
0.75 to <2.50	37	1.30	0.1	50.68	3.2	41	110.67
2.50 to <10.00	30	4.65	0.1	53.57	1.9	37	122.52
10.00 to <100.00	3	17.06	<0.1	42.85	3.8	6	195.05
100.00 (Default)	0	100.00	<0.1	89.08	2.9	0	7.18
<b>Sub-total</b>	<b>987</b>	<b>0.43</b>	<b>0.5</b>	<b>48.97</b>	<b>2.0</b>	<b>375</b>	<b>38.00</b>
<b>Specialized Lending</b>							
0.00 to <0.15	98	0.07	<0.1	52.18	4.4	43	43.34
0.15 to <0.25	32	0.23	<0.1	43.19	4.0	20	61.08
0.25 to <0.50	60	0.39	<0.1	36.53	3.6	36	59.08
0.50 to <0.75	36	0.64	<0.1	48.39	4.6	42	116.65
0.75 to <2.50	112	1.37	0.1	40.75	4.1	130	115.35
2.50 to <10.00	401	4.83	<0.1	20.31	4.8	329	81.89
10.00 to <100.00	27	13.61	<0.1	19.76	1.9	28	101.75
100.00 (Default)	6	100.00	<0.1	49.28	4.5	1	10.15
<b>Sub-total</b>	<b>774</b>	<b>4.08</b>	<b>0.2</b>	<b>31.06</b>	<b>4.4</b>	<b>626</b>	<b>80.94</b>
<b>Other</b>							
0.00 to <0.15	83,698	0.04	9.9	33.40	0.7	6,842	8.17
0.15 to <0.25	2,593	0.23	0.6	27.42	2.9	915	35.28
0.25 to <0.50	3,684	0.39	0.7	33.47	1.6	1,828	49.61
0.50 to <0.75	3,611	0.64	0.9	28.90	1.5	1,881	52.09
0.75 to <2.50	3,534	1.30	1.0	40.77	2.5	3,421	96.80
2.50 to <10.00	1,329	4.58	0.4	34.10	2.8	1,620	121.86
10.00 to <100.00	540	15.29	<0.1	10.26	1.0	299	55.43
100.00 (Default)	18	100.00	<0.1	11.97	1.6	17	91.86
<b>Sub-total</b>	<b>99,007</b>	<b>0.29</b>	<b>13.6</b>	<b>33.22</b>	<b>0.9</b>	<b>16,822</b>	<b>16.99</b>



Jun 30, 2019

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 %)
<b>Retail</b>							
0.00 to <0.15	13	0.06	0.2	58.30	1.4	1	9.87
0.15 to <0.25	1	0.23	<0.1	57.69	6.2	0	24.88
0.25 to <0.50	4	0.39	<0.1	57.31	7.2	1	34.92
0.50 to <0.75	11	0.64	0.1	57.42	1.4	5	47.06
0.75 to <2.50	17	1.33	0.1	56.82	2.6	11	63.61
2.50 to <10.00	12	4.79	0.1	56.47	1.0	9	77.13
10.00 to <100.00	2	25.62	<0.1	57.00	1.0	2	90.92
100.00 (Default)	0	100.00	<0.1	16.50	0.3	0	206.25
<b>Sub-total</b>	<b>60</b>	<b>2.26</b>	<b>0.6</b>	<b>57.25</b>	<b>2.1</b>	<b>30</b>	<b>49.34</b>
<b>of which:</b>							
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other retail SMEs							
0.00 to <0.15	0	0.13	<0.1	56.67	2.0	0	16.92
0.15 to <0.25	1	0.23	<0.1	57.49	2.8	0	21.19
0.25 to <0.50	2	0.39	<0.1	56.85	1.9	1	29.02
0.50 to <0.75	4	0.64	<0.1	57.07	1.1	1	38.09
0.75 to <2.50	5	1.50	0.1	55.68	1.7	3	52.99
2.50 to <10.00	6	4.79	<0.1	55.91	0.9	4	66.15
10.00 to <100.00	1	18.54	<0.1	57.00	1.0	1	95.50
100.00 (Default)	0	100.00	<0.1	16.50	0.3	0	206.25
<b>Sub-total</b>	<b>19</b>	<b>3.49</b>	<b>0.2</b>	<b>56.32</b>	<b>1.3</b>	<b>10</b>	<b>53.31</b>
Other retail non-SMEs							
0.00 to <0.15	13	0.05	0.2	58.35	1.3	1	9.64
0.15 to <0.25	1	0.23	<0.1	57.88	9.7	0	28.56
0.25 to <0.50	2	0.39	<0.1	57.66	11.1	1	39.35
0.50 to <0.75	7	0.64	<0.1	57.61	1.6	4	51.83
0.75 to <2.50	12	1.26	0.1	57.30	3.0	8	68.06
2.50 to <10.00	6	4.80	<0.1	57.08	1.1	5	89.01
10.00 to <100.00	0	51.63	<0.1	57.00	0.7	0	74.12
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>41</b>	<b>1.68</b>	<b>0.4</b>	<b>57.68</b>	<b>2.5</b>	<b>19</b>	<b>47.47</b>
<b>Total (all exposure classes)</b>	<b>128,831</b>	<b>0.32</b>	<b>15.7</b>	<b>35.00</b>	<b>1.0</b>	<b>24,204</b>	<b>18.79</b>

Our RWA for counterparty credit risk in the advanced approach were at € 22.0 billion as of December 31, 2019, compared to € 24.2 billion as of June 30, 2019. The decrease of € 2.2 billion was primarily driven by the exposure class Corporates mainly in our Capital Release Unit in relation to its further wind-down.

## 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, 2019
(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 %)
<b>Central governments and central banks</b>							
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Institutions</b>							
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Corporates</b>							
0.00 to <0.15	5	0.07	<0.1	45.00	2.5	1	26.73
0.15 to <0.25	84	0.22	0.2	45.00	2.5	40	47.68
0.25 to <0.50	39	0.38	0.1	45.00	2.5	25	64.31
0.50 to <0.75	7	0.69	0.1	45.00	2.5	5	77.15
0.75 to <2.50	3	1.49	<0.1	45.00	2.5	3	102.43
2.50 to <10.00	0	3.78	<0.1	45.00	2.5	1	142.14
10.00 to <100.00	0	19.69	<0.1	45.00	2.5	1	251.26
100.00 (Default)	3	100.00	<0.1	45.00	2.5	0	0
<b>Sub-total<sup>1</sup></b>	<b>231</b>	<b>2.31</b>	<b>0.4</b>	<b>45.00</b>	<b>2.5</b>	<b>142</b>	<b>61.36</b>
<b>of which:</b>							
<b>SMEs</b>							
0.00 to <0.15	0	0.04	<0.1	45.00	2.5	0	23.17
0.15 to <0.25	5	0.22	<0.1	45.00	2.5	2	37.60
0.25 to <0.50	2	0.38	<0.1	45.00	2.5	1	51.10
0.50 to <0.75	3	0.69	<0.1	45.00	2.5	2	65.72
0.75 to <2.50	1	1.65	<0.1	45.00	2.5	1	87.47
2.50 to <10.00	0	3.78	<0.1	45.00	2.5	0	121.10
10.00 to <100.00	0	0	0	0	0	0	0
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>10</b>	<b>0.53</b>	<b>0.1</b>	<b>45.00</b>	<b>2.5</b>	<b>5</b>	<b>52.22</b>
<b>Specialized Lending</b>							
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
<b>Sub-total<sup>1</sup></b>	<b>90</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>65</b>	<b>72.73</b>
<b>Other</b>							
0.00 to <0.15	5	0.07	<0.1	45.00	2.5	1	26.87
0.15 to <0.25	80	0.22	0.1	45.00	2.5	38	48.26
0.25 to <0.50	37	0.38	0.1	45.00	2.5	24	64.85
0.50 to <0.75	4	0.69	<0.1	45.00	2.5	3	84.83
0.75 to <2.50	2	1.41	<0.1	45.00	2.5	2	109.23
2.50 to <10.00	0	3.78	<0.1	45.00	2.5	1	145.46
10.00 to <100.00	0	19.69	<0.1	45.00	2.5	1	251.26
100.00 (Default)	3	100.00	<0.1	45.00	2.5	0	0
<b>Sub-total</b>	<b>132</b>	<b>2.45</b>	<b>0.2</b>	<b>45.00</b>	<b>2.5</b>	<b>71</b>	<b>54.27</b>
<b>Total</b>	<b>231</b>	<b>2.31</b>	<b>0.4</b>	<b>45.00</b>	<b>2.5</b>	<b>142</b>	<b>61.36</b>

<sup>1</sup> 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, 2019
(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 %)
<b>Central governments and central banks</b>							
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Institutions</b>							
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
<b>Sub-total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Corporates</b>							
0.00 to <0.15	5	0.07	<0.1	45.00	2.5	1	28.18
0.15 to <0.25	93	0.22	0.2	45.00	2.5	45	47.92
0.25 to <0.50	35	0.38	0.1	45.00	2.5	22	63.87
0.50 to <0.75	5	0.69	<0.1	45.00	2.5	4	76.50
0.75 to <2.50	2	1.48	<0.1	45.00	2.5	2	98.73
2.50 to <10.00	1	3.81	<0.1	45.00	2.5	1	141.98
10.00 to <100.00	0	18.72	<0.1	45.00	2.5	0	201.78
100.00 (Default)	3	100.00	<0.1	45.00	2.5	0	0
<b>Sub-total<sup>1</sup></b>	<b>246</b>	<b>2.35</b>	<b>0.4</b>	<b>45.00</b>	<b>2.5</b>	<b>166</b>	<b>67.69</b>
<b>of which:</b>							
<b>SMEs</b>							
0.00 to <0.15	0	0	0	0	0	0	0
0.15 to <0.25	5	0.21	0.1	45.00	2.5	2	36.88
0.25 to <0.50	2	0.38	<0.1	45.00	2.5	1	51.01
0.50 to <0.75	2	0.69	<0.1	45.00	2.5	1	63.21
0.75 to <2.50	1	1.44	<0.1	45.00	2.5	1	88.06
2.50 to <10.00	0	4.13	<0.1	45.00	2.5	0	105.78
10.00 to <100.00	0	18.72	<0.1	45.00	2.5	0	201.78
100.00 (Default)	0	0	0	0	0	0	0
<b>Sub-total</b>	<b>10</b>	<b>0.78</b>	<b>0.1</b>	<b>45.00</b>	<b>2.5</b>	<b>5</b>	<b>53.34</b>
<b>Specialized Lending</b>							
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
<b>Sub-total<sup>1</sup></b>	<b>102</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>89.51</b>
<b>Other</b>							
0.00 to <0.15	5	0.07	<0.1	45.00	2.5	1	28.18
0.15 to <0.25	89	0.22	0.1	45.00	2.5	43	48.49
0.25 to <0.50	32	0.38	<0.1	45.00	2.5	21	64.85
0.50 to <0.75	3	0.69	<0.1	45.00	2.5	2	85.13
0.75 to <2.50	1	1.52	<0.1	45.00	2.5	1	111.31
2.50 to <10.00	1	3.78	<0.1	45.00	2.5	1	145.46
10.00 to <100.00	0	0	0	0	0	0	0
100.00 (Default)	3	100.00	<0.1	45.00	2.5	0	0
<b>Sub-total</b>	<b>134</b>	<b>2.47</b>	<b>0.2</b>	<b>45.00</b>	<b>2.5</b>	<b>70</b>	<b>52.19</b>
<b>Total</b>	<b>246</b>	<b>2.35</b>	<b>0.4</b>	<b>45.00</b>	<b>2.5</b>	<b>166</b>	<b>67.69</b>

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

## 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

in € m.	Three months ended Dec 31, 2019		Three months ended Sep 30, 2019	
	a	b	a	b
	RWA	Capital requirements	RWA	Capital requirements
1 Counterparty credit risk RWA under the IMM opening balance	18,839	1,507	18,823	1,506
2 Book size	(1,571)	(126)	(750)	(60)
3 Book quality	51	4	9	1
4 Model updates	0	0	318	25
5 Methodology and policy	(257)	(21)	0	0
6 Acquisitions and disposals	0	0	0	0
7 Foreign exchange movements	(224)	(18)	439	35
8 Other	0	0	0	0
9 Counterparty credit risk RWA under the IMM closing balance	16,838	1,347	18,839	1,507

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 RWA for counterparty credit risk exposures under the IMM decreased by 10.6 % or € 2.0 billion since September 30, 2019 and was primarily driven by the decrease in category “Book size” reflecting reduced business activities mainly in our Capital Release Unit, in addition to FX related decreases. Furthermore, the category “Methodology and policy” which contributed to the overall decrease includes the impact from refinements in accounting treatment for derivatives.

## 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

in € m.	Dec 31, 2019				
	a	b	c	d	e
	Gross positive fair value or net carrying amount	Netting benefits	Netted current credit exposure	Collateral held	Net credit exposure
1 Derivatives	358,234	284,797	73,437	66,025	7,412
2 Securities Financing Transactions	447,791	393,639	54,152	7,544	46,609
3 Cross-product netting	0	0	0	0	0
4 Total	806,025	678,436	127,589	73,568	54,021

		Jun 30, 2019				
		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	408,769	327,473	81,296	79,325	1,971
2	Securities Financing Transactions	521,384	434,671	86,713	9,070	77,642
3	Cross-product netting	0	0	0	0	0
4	<b>Total</b>	<b>930,153</b>	<b>762,144</b>	<b>168,009</b>	<b>88,396</b>	<b>79,614</b>

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, 2019					
		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	1,934	72,920	2	54,829	160,266	199,756
	Bonds	1,526	21,220	944	18,408	191,422	166,114
	Equity securities	50	2,463	0	0	79,711	75,590
	Other collateral	3,589	1,221	3,799	322	4,984	2,250
	<b>Total</b>	<b>7,098</b>	<b>97,824</b>	<b>4,746</b>	<b>73,559</b>	<b>436,383</b>	<b>443,710</b>

		Jun 30, 2019					
		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	2,057	95,046	0	60,088	171,901	209,022
	Bonds	1,723	23,505	967	18,637	186,742	163,797
	Equity securities	332	10,026	0	0	131,099	143,472
	Other collateral	4,697	1,308	4,487	0	6,063	5,093
	<b>Total</b>	<b>8,809</b>	<b>129,885</b>	<b>5,453</b>	<b>78,725</b>	<b>495,805</b>	<b>521,384</b>

For further details on derivative exposure please also refer to our Annual Report 2019 table “Maximum exposure to credit risk” on page 111 and table “Credit exposure from derivatives” on page 130.

## 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, 2019			Jun 30, 2019		
		a	b	c	a	b	c
		Credit derivative hedges			Credit derivative hedges		
		Protection bought	Protection sold	Other credit derivatives	Protection bought	Protection sold	Other credit derivatives
<b>Notionals</b>							
	Single-name credit default swaps	8,633	276	202,279	7,274	239	209,424
	Index credit default swaps	0	0	459,269	0	0	565,306
	Total return swaps	0	35	10,989	0	16	10,993
	Credit options	0	0	54,451	0	0	69,860
	<b>Total notionals</b>	<b>8,633</b>	<b>311</b>	<b>726,989</b>	<b>7,274</b>	<b>255</b>	<b>855,583</b>
<b>Fair values</b>							
	Positive fair value (asset)	149	112	10,628	159	18	10,150
	Negative fair value (liability)	622	108	11,474	533	24	11,040

The drop of credit derivatives exposures in the second half of 2019 to € 0.7 trillion from € 0.9 trillion was primarily driven by index credit default swaps.

## 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' ( $\alpha$ ). 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 demand for credit risk

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

### Economic capital demand for credit risk per business area

in € m.	Dec 31, 2019	Dec 31, 2018	2019 increase (decrease) from 2018	
			in € m.	in %
Corporate Bank	2,417	1,861	556	30
Investment Bank	4,064	3,804	261	7
Private Bank	2,190	3,214	(1,024)	(32)
Asset Management	71	52	19	36
Capital Release Unit	859	1,007	(148)	(15)
Corporate & Other	1,155	672	483	72
<b>Total</b>	<b>10,757</b>	<b>10,610</b>	<b>147</b>	<b>1</b>

The economic capital demand for credit risk was € 0.1 billion or 1 % higher as of December 31, 2019 compared to year-end 2018 mainly due to higher transfer and settlement risk components with offsetting effects from a lower counterparty risk component. The increase in transfer risk is largely driven by enhanced modelling and the lower counterparty risk component mainly by the bank's restructuring announced in July this year.

## Market risk

### Own funds requirements for market risk under the standardized approach

#### Article 445 CRR - Market Risk Standardized Approach

As of December 31, 2019, the securitization positions, for which the specific interest rate risk is calculated using the market risk standardized approach, generated capital requirements of € 148 million corresponding to risk weighted-assets of € 1.9 billion. As of June 30, 2019 these positions generated capital requirements of € 269 million corresponding to risk weighted-assets of € 3.4 billion.

Of the securitization positions, the capital requirement for the nth-to-default credit default swaps was € 1.2 million corresponding to risk weighted-assets of € 14.7 million compared with € 1.3 million and € 16 million as of June 30, 2019.

The capital requirement for Collective Investment Undertakings under the market risk standardized approach was € 21 million corresponding to risk weighted-assets of € 269 million as of December 31, 2019, compared with € 7 million and € 87 million as of June 30, 2019

The capital requirement for longevity risk under the market risk standardized approach was € 13 million corresponding to risk-weighted assets of € 163 million as of December 31, 2019, compared with € 15 million and € 183 million as of June 30, 2019.

#### EU MR1 – Market risk under the standardized approach

in € m.	Dec 31, 2019		Jun 30, 2019	
	a	b	a	b
	RWA	Capital requirements	RWA	Capital requirements
<b>Outright products</b>				
1 Interest rate risk (general and specific)	60	5	0	0
2 Equity risk (general and specific) <sup>1</sup>	172	14	69	6
3 Foreign exchange risk <sup>2</sup>	247	20	88	7
4 Commodity risk	0	0	0	0
4a Longevity risk	163	13	183	15
<b>Options</b>				
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) <sup>3</sup>	1,851	148	3,361	269
<b>9 Total</b>	<b>2,493</b>	<b>200</b>	<b>3,702</b>	<b>296</b>

<sup>1</sup> Interest Rate risk RWA of € 60 million is from collective investment undertakings

<sup>2</sup> Equity risk RWA of € 172 million is from collective investment undertakings

<sup>3</sup> Foreign Exchange risk RWA includes € 89 million from the former Postbank portfolio, € 38 million from collective investment undertakings, and €120 million placeholder related to foreign exchange exposures

<sup>4</sup> Securitization RWA of € 1,851 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



#### 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. For foreign exchange risk there is an additional component using a revaluation approach for non-linear exposures. “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 enables us to apply a consistent measure across our fair value exposures. It allows a comparison of risk in different businesses, and also provides a means of aggregating and netting positions within a portfolio to reflect correlations and offsets between different asset classes. Furthermore, it facilitates comparisons of our market risk both over time and against our daily trading results.

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

- The use of historical market data may not be a good indicator of potential future events, particularly those that are extreme in nature. This “backward-looking” limitation can cause VaR to understate future potential losses (as in 2008), but can also cause it to be overstated.

- 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.

Our process of systematically capturing and evaluating risks currently not captured in our VaR mode has been further developed and improved. An assessment is made to determine the level of materiality of these risks and material risks are prioritized for inclusion in our internal model. Risks not in VaR are monitored and assessed on a regular basis through our Risk Not In VaR (RNIV) framework.

We are committed to the ongoing development of our internal risk models, and we allocate substantial resources to reviewing, validating and improving them. We are currently in transition of the process to move to a calculation using a Historical Simulation approach predominantly based on Full Revaluation.

#### 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

### 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).

## 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 and Control, 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.

A 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.

## 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.

## 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 2019, Note 13 "Financial instruments carried at fair value", page 282.

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, 2019 the amount of the additional value adjustments was € 1.7 billion. The December 31, 2018 amount was € 1.5 billion. The increase was predominantly driven by exposure changes and methodology enhancements throughout the year.

As of December 31, 2019 the reduction of the expected loss shortfall from subtracting the additional value adjustments was € 128 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 103 of our Annual Report 2019.

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

	Dec 31, 2019		Jun 30, 2019	
	a	b	a	b
in € m.	RWA	Capital requirements	RWA	Capital requirements
1 VaR (higher of values a and b)	4,273	342	4,835	387
a) Previous day's VaR (Article 365(1) (VaRt-1))	–	75	–	98
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)	–	342	–	387
2 SVaR (higher of values a and b)	13,734	1,099	13,787	1,103
a) Latest SVaR (Article 365(2) (sVaRt-1))	–	265	–	294
b) Average of the SVaR (Article 365(2) during the preceding sixty business days (sVaRavg) x multiplication factor (ms) (Article 366)	–	1,099	–	1,103
3 Incremental risk charge -IRC (higher of values a and b)	4,868	389	6,709	537
a) Most recent IRC value (incremental default and migration risks calculated in accordance with Article 370 and Article 371 of the CRR)	–	341	–	537
b) Average of the IRC number over the preceding 12 weeks	–	389	–	415
4 Comprehensive Risk Measure – CRM (higher of values a, b and c)	–	–	–	–
a) Most recent risk number for the correlation trading portfolio (article 377 of the CRR)	–	–	–	–
b) Average of the risk number for the correlation trading portfolio over the preceding 12-weeks	–	–	–	–
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)	–	–	–	–
5 Other	0	0	0	0
6 Total	22,875	1,830	25,331	2,026

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, 2019						
		a	b	c	d	e	f	g
in € m.		VaR	SVaR	IRC	Compre- hensive risk measure	Other	Total RWA	Total capital requirements
<b>1</b>	Market Risk RWA opening balance <sup>1</sup>	<b>5,199</b>	<b>15,580</b>	<b>7,162</b>	–	<b>0</b>	<b>27,940</b>	<b>2,235</b>
1a	Regulatory adjustment <sup>2</sup>	(3,898)	(11,696)	(1,553)	–	0	(17,147)	(1,372)
1b	RWA at the previous quarter-end (end of the day) <sup>3</sup>	1,300	3,884	5,609	–	0	10,793	863
2	Movement in risk levels	(203)	(566)	(1,349)	–	0	(2,118)	(169)
3	Model updates/changes	9	(1)	0	–	0	8	1
4	Methodology and policy	0	0	0	–	0	0	0
5	Acquisitions and disposals	0	0	0	–	0	0	0
6	Foreign exchange movements	0	0	0	–	0	0	0
6a	Market data changes and recalibrations	(171)	0	0	–	0	(171)	(14)
7	Other	0	0	0	–	0	0	0
8a	RWA at the end of the reporting period (end of the day) <sup>3</sup>	936	3,317	4,260	–	0	8,513	681
8b	Regulatory adjustment <sup>2</sup>	3,337	10,417	608	–	0	14,362	1,149
<b>8</b>	<b>Market Risk RWA closing balance<sup>1</sup></b>	<b>4,273</b>	<b>13,734</b>	<b>4,868</b>	–	<b>0</b>	<b>22,875</b>	<b>1,830</b>

<sup>1</sup> Represents RWA at previous and current reporting period quarter end.

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

<sup>3</sup> 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, 2019						
		a	b	c	d	e	f	g
in € m.		VaR	SVaR	IRC	Compre- hensive risk measure	Other	Total RWA	Total capital requirements
<b>1</b>	Market Risk RWA opening balance <sup>1</sup>	<b>4,835</b>	<b>13,787</b>	<b>6,709</b>	–	<b>0</b>	<b>25,331</b>	<b>2,026</b>
1a	Regulatory adjustment <sup>2</sup>	(3,616)	(10,109)	(1,525)	–	0	(15,250)	(1,220)
1b	RWA at the previous quarter-end (end of the day) <sup>3</sup>	1,219	3,678	5,184	–	0	10,081	806
2	Movement in risk levels	266	309	425	–	0	1,000	80
3	Model updates/changes	3	(103)	0	–	0	(99)	(8)
4	Methodology and policy	0	0	0	–	0	0	0
5	Acquisitions and disposals	0	0	0	–	0	0	0
6	Foreign exchange movements	0	0	0	–	0	0	0
6a	Market data changes and recalibrations	(189)	0	0	–	0	(189)	(15)
7	Other	0	0	0	–	0	0	0
8a	RWA at the end of the reporting period (end of the day) <sup>3</sup>	1,300	3,884	5,609	–	0	10,794	863
8b	Regulatory adjustment <sup>2</sup>	3,898	11,696	1,553	–	0	17,147	1,372
<b>8</b>	<b>Market Risk RWA closing balance<sup>1</sup></b>	<b>5,199</b>	<b>15,580</b>	<b>7,162</b>	–	<b>0</b>	<b>27,940</b>	<b>2,235</b>

<sup>1</sup> Represents RWA at previous and current reporting period quarter end.

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

<sup>3</sup> 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, 2019 the RWA for market risk was € 25.4 billion. The IMA (Internal Models Approach) components of this totaled € 22.9 billion, which was a decrease of € 5.1 billion since September 30, 2019 driven by a reduction in risk levels across incremental risk charge, value-at-risk and stressed value-at-risk due to de-risking activities.

## 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.

#### EU MR3 – IMA values for trading portfolios<sup>1</sup>

in € m.		Dec 31, 2019	Jun 30, 2019
		a	a
<b>VaR (10 day 99 %)</b>			
1	Maximum value	110.5	107.4
2	Average value	86.4	87.6
3	Minimum value	63.6	69.6
4	Period end	69.0	83.0
<b>SVaR (10 day 99 %)</b>			
5	Maximum value	311.5	328.3
6	Average value	260.0	262.3
7	Minimum value	216.1	166.8
8	Period end	249.2	259.2
<b>IRC (99.9 %)</b>			
9	Maximum value	694.4	684.1
10	Average value	481.2	562.1
11	Minimum value	340.8	414.7
12	Period end	340.8	414.7
<b>Comprehensive risk capital charge (99.9 %)</b>			
13	Maximum value	-	-
14	Average value	-	-
15	Minimum value	-	-
16	Period end	-	-

<sup>1</sup> 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" in this report on the page 146.

### 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 2019, section "Results of regulatory backtesting of trading market risk" on page 146 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 demand for our trading market risk

The economic capital demand for trading market risk decreased to € 3.6 billion as of December 31, 2019, compared to € 4.0 billion at year-end 2018. The decrease was driven primarily by the de-risking of portfolios that were moved to the Capital Release Unit, most notably from Equities and also Emerging Market Debt businesses.

## Economic capital demand for our nontrading market risk portfolios per business area

### Economic capital demand of nontrading portfolios by business division

in € m.	Dec 31, 2019	Dec 31, 2018	2019 increase (decrease) from 2018	
			in € m.	in %
Corporate Bank	387	175	212	121
Investment Bank	411	496	(85)	(17)
Private Bank	1,863	1,135	728	64
Asset Management	448	358	90	25
Capital Release Unit	63	99	(36)	(36)
Corporate & Other	5,003	4,032	971	24
<b>Total</b>	<b>8,175</b>	<b>6,295</b>	<b>1,880</b>	<b>30</b>

Nontrading market risk economic capital usage totaled € 8.2 billion as of December 31, 2019, which is € 1.9 billion, or 30 %, above our economic capital usage at year-end 2018.

In Corporate Bank nontrading market risk arises mainly from interest rate risk, including risk arising from modelling of non-maturity deposits and investment risk. The increase of economic capital usage for Corporate Bank was driven by lower diversification effects with other business divisions.

In Investment Bank nontrading market risk arises primarily from investment risk and interest rate risk in the banking book. The decrease of economic capital usage for Investment Bank was mainly driven a reduction in interest rate risk exposure.

In the Private Bank nontrading market risk arises primarily from investment risk, interest rate risk, including risk arising from modelling of client deposits and credit spread risk. The increase of economic capital usage for Private Bank was driven by lower diversification effects with other business divisions.

In Asset Management nontrading market risk arises from investment risk and guaranteed funds risk. The increase in economic capital usage in Asset Management was mainly driven by increased investment risk.

In Capital Release Unit nontrading market risk mainly arises from investment risk. The decrease of economic capital usage for Capital Release Unit was mainly driven by reduction in the investment inventory.

In Corporate & Other nontrading market risk mainly arises from structural foreign exchange risk, pension risk, interest rate risk in the banking book, credit spread risk and equity risk from our equity compensation plans. The increase of economic capital usage in Corporate & Other was mainly driven by increased economic value interest rate risk exposure built-up to reduce earnings risk exposure, partially offset by a decline in pension risk.



# 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 the fourth quarter of 2017, the economic capital is also set at 99.9 % percentile; see the section "Internal Capital Adequacy" for details. Both regulatory and economic capital requirements are calculated for a time horizon of one year.

The regulatory and economic capital demand calculations are performed on a quarterly basis. NFRM 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 2019, our total operational risk losses increased by 35 % compared with 2018, though they remained well below previous years' levels and continued to be predominantly driven by losses and provisions arising from civil litigation and regulatory enforcement. Such losses still make up 84 % 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 27 "Provisions" to the consolidated financial statements. The operational risk losses from civil litigation and regulatory enforcement increased by € 131 million or 73 % while our non-legal operational risk losses decreased by € 34 million or 35 % compared to 2018.

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 27 "Provisions" of our Annual Report 2019.

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 historical 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. 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 stress scenarios on our capital and the profit-and-loss account. It also contains reputational impacts. In 2019, 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 Group-wide 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)

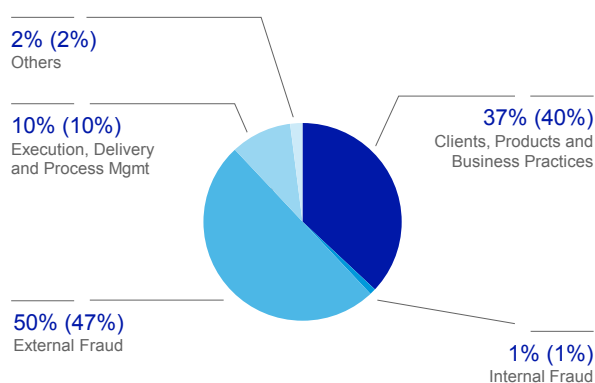
in € m.	2019	2018 <sup>1</sup>
Clients, Products and Business Practices	271	127
Internal Fraud	27	49
External Fraud	21	50
Execution, Delivery and Process Management	50	31
Others	5	20
<b>Group</b>	<b>374</b>	<b>277</b>

<sup>1</sup> Changed 2018 loss figures due to subsequent capture of losses and reclassification.

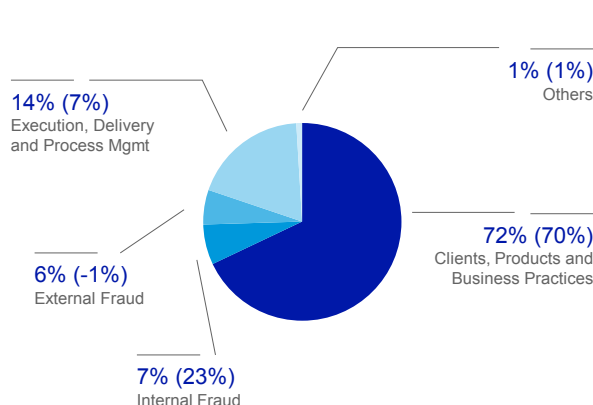
As of December 31, 2019, operational losses increased by € 97 million or 35 % compared to year-end 2018. The increase was driven by the event types “Clients, Products and Business Practices” and “Execution, Delivery and Process Management”, due to settlements reached and increased litigation reserves for unsettled cases in 2018.

### Operational losses by event type occurred in the period 2019 (2014-2018)<sup>1</sup>

#### Frequency of Operational Losses (first posting date)



#### Distribution of Operational Losses (posting date)



<sup>1</sup> Percentages in brackets correspond to loss frequency respectively to loss amount for losses occurred in 2014-2018 period. Frequency and amounts can change subsequently.

The above left chart “Frequency of Operational Losses” summarizes operational risk events which occurred in 2019 compared to the five-year period 2014-2018 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 2019, 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 50 % and the event type “Clients, Products and Business Practices” with 37 % 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 1 % of the loss events in the period 2019.

The above right chart “Distribution of Operational Losses” summarizes operational risk loss postings recognized in the profit/loss in 2019 compared to the five-year period 2014-2018. The event type “Clients, Products and Business Practices” dominates the operational loss distribution with a share of 72 % and is determined by outflows related to litigation, investigations and enforcement actions. “Execution, Delivery and Process Management” has the second highest share (14 %). Finally, the event types “Internal Fraud” (7 %), “External Fraud” (6 %) and “Others” (1 %) are minor, compared to the other 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 demand for operational risks

### Economic capital demand for operational risk by business division

in € m.			2019 increase (decrease) from 2018	
	Dec 31, 2019	Dec 31, 2018	in € m.	in %
Corporate Bank	585	771	(186)	(24)
Investment Bank	2,122	2,386	(264)	(11)
Private Bank	666	711	(45)	(6)
Asset Management	366	401	(36)	(9)
Capital Release Unit	2,074	3,090	(1,016)	(33)
Corporate & Other	0	0	0	N/M
<b>Total economic capital demand for operational risk</b>	<b>5,813</b>	<b>7,359</b>	<b>(1,546)</b>	<b>(21)</b>

The operational risk economic capital demand totaled € 5.8 billion as of December 31, 2019, which was € 1.5 billion or 21 % lower than the € 7.4 billion economic capital demand as of December 31, 2018. In line with the development of our RWA for operational risk, the decrease was largely driven by two factors: A lighter loss profile feeding into our capital model as well as a number of model improvements driven by new regulations, such as the AMA Regulatory Technical Standards (RTS), de-risking before and during the Group’s transformation, and an improved capture of our risk profile. For a detailed description see the section “Operational Risk Management” in our Annual Report 2019.

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

### Description of the use of insurance 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 € 154 million as of December 31, 2019 compared with € 315 million as of December 31, 2018. 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. In our consolidated balance sheet, these equity investments are classified as Equity method investments and financial assets mandatory at fair value through profit and loss (FVTPL). The group is not reporting these investments as 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 235, Note 13 "Financial instruments carried at fair value" on page 282 and Note 16 "Equity method investments" to the consolidated financial statements of our Annual Report 2019 on page 298.

### Article 447 (b) CRR - Equity investment exposure

#### Equity investments according to IFRS classification

in € m.	Carrying value	
	Dec 31, 2019 <sup>1</sup>	Dec 31, 2018
<b>Equity method investments</b>	<b>929</b>	<b>879</b>
Exchange-traded positions	0	0
Non-exchange-traded positions	929	879
<b>Financial assets mandatory at fair value through profit and loss - equity instruments</b>	<b>1,731</b>	<b>1,956</b>
Exchange-traded positions	25	24
Non-exchange-traded positions	1,705	1,932
<b>Total equity investments</b>	<b>2,660</b>	<b>2,835</b>

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, 2019. 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, 2019, a slight excess of € 140.0 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, 2019 similar to December 31, 2018.
- 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 € 58 million as of December 31, 2019 and € 60 million as of December 31, 2018.
- The regulatory equity position includes € 690 million EAD as of December 31, 2019 and € 534 million EAD as of December 31, 2018 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 2019, chapter "Market risk management", section "Equity and investment risk" on page 84.

## 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.	2019	2018
Gains and losses on disposal	245	334
Impairments	0	(3)
Pro-rata share of net income (loss)	104	129
<b>Total realized gains (losses) from equity investments</b>	<b>349</b>	<b>460</b>
	Dec 31, 2019	Dec 31, 2018
Unrealized revaluation gains (losses)	509	441
Difference between carrying value and fair value <sup>1</sup>	0	11
<b>Total unrealized gains (losses) from equity investments</b>	<b>509</b>	<b>452</b>

The realized gains (losses) on disposals, the impairments and the pro-rata share of net income (loss) are referring to the reporting period 2019 and 2018 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, 2019, and December 31, 2018.

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

Please refer to our Annual Report 2019 chapter "Risk and capital management", section "Nontrading market risk" with its sub-section "Interest rate risk in the banking book" on page 83 as well as to the section "Nontrading market risk exposures" and therein the sub-section "Interest rate risk in the banking book" on page 149.

## 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 148 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-f) 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 Strategic Corporate Lending ("SCL"). SCL 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 IB, 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; this is not an active strategy.

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 secured 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 166 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 79 in our Annual Report 2019 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 2019 on page 66 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 160.

## 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).

In January 2019, Regulation (EU) 2017/2395 introduced changes to the methodology for determining RWAs for new securitizations originated on or after January 1, 2019 (the new securitization framework). All securitization transactions originated before this date remain subject to the rules introduced by CRR as applicable until December 31, 2018 (grandfathered securitization framework) and will be subject to the new framework on January 1, 2020.

## Calculation of regulatory capital requirements for banking book securitizations – grandfathered securitization framework

The grandfathered securitization framework determines the regulatory capital requirements for the credit risk of banking book securitizations pursuant to Articles 242 to 270 of the CRR as applicable until December 31, 2018, 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 as applicable until December 31, 2018.

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 259 (3) and (4) CRR as applicable until December 31, 2018. 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, 2019.

- the risk concentration approach pursuant to Article 253 CRR as applicable until December 31, 2018 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 Article 262 CRR as applicable until December 31, 2018 or the internal assessment approach pursuant to Article 259 (3) and (4) CRR as applicable until December 31, 2018.
- If neither of the aforementioned approaches can be applied, the position receives a risk weight of 1,250 %.

## Calculation of regulatory capital requirements for banking book securitizations – new securitization framework

The new securitization framework determines the regulatory capital requirements for the credit risk of banking book securitizations pursuant to Articles 242 to 270e CRR, and distinguishes between the Securitization Internal Ratings-Based Approach (SEC-IRBA), the Securitization Standardized Approach (SEC-SA) and the Securitization External Ratings-Based Approach (SEC-ERBA). The new framework also introduces a specific framework for Simple, Transparent and Standardized (STS) securitizations. STS securitizations are defined in Regulation (EU) 2017/2402 and are subject to a beneficial capital treatment in the CRR.

The SEC-IRBA is applied for securitization positions, where at least 95 % of the securitized portfolio is in scope of an IRBA rating model and where sufficient information in relation to the securitized portfolio is available to calculate the risk-weighted exposure amounts under the IRB approach. Note that the ECB may preclude the application of the SEC-IRBA on a case-by-case basis as per Article 258 CRR. Currently, there are no securitization positions for which the ECB has precluded the application of the SEC-IRBA.

In general, the SEC-SA must be applied to all re-securitizations and for all securitizations for which the SEC-IRBA must not be applied, but the information required to apply the SEC-SA is available. Note, however, that instead of the SEC-SA, the SEC-ERBA must be applied for securitization positions with at least one eligible external rating or where a rating might be inferred:

- where the application of the SEC-SA would result in a risk-weight higher than 25 %, or
- where – for positions not qualifying as positions in an STS securitization – the application of the SEC-ERBA would result in a risk weight higher than 75 %, or
- for securitization transactions backed by pools of auto loans, auto leases and equipment leases.

Where the SEC-SA may not be used, the SEC-ERBA must be applied for securitization positions with at least one eligible external rating or where an external rating can be inferred. 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 270d CRR.

We do not make use of the option provided for in Article 254 (3) CRR to consistently apply the SEC-ERBA instead of the SEC-SA for all rated securitization positions or positions for which a rating can be inferred.

In addition to the above approaches to determine capital requirements, Article 267 CRR introduces a risk weight cap for senior securitization positions based on the average risk weight of the securitized portfolio. Article 268 CRR introduces a maximum capital requirement for all securitization positions of a specific securitization transaction based on the capital requirement applicable to the securitized portfolio

Based on Article 254 (5) CRR, an Internal Assessment Approach may be applied for unrated positions in 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, 2019.

As of yearend 2019, the portfolio was divided into 34 % under new securitization framework and 66 % under grandfathered securitization framework.

Approximately 84% of the total banking book securitization exposure is subject to the supervisory formula approach (SFA) or SEC-IRBA. 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 / SEC-IRBA 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 / SEC-IRBA, 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. 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.

The ratings based approach applies to approximately 7% of our IRBA- and CRSA-securitization exposure. The majority of securitization positions with an eligible external or inferred external credit assessment are securitization positions held as investor. The remaining 22% of the portfolio was classified under CRSA or SEC-SA. 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.

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

Overall, the regulatory capital requirements for the market risk of trading book securitizations consist of a general and specific market risk component. 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 specific market risk is principally calculated based on the market risk standardized approach (MRSA) pursuant to Article 337 CRR.

The formerly used internal model comprehensive risk measure was decommissioned in the fourth quarter of 2018 following regulatory approval due to the correlation trading portfolio being wound down. A remaining small exposure of the correlation trading portfolio is being maintained with a fixed defined RWA charge of € 75 million as defined with the competent authority ECB and is covered by the incremental risk charge under the market risk standardized approach.

As described above, the capital requirement for specific market risk is calculated based on the market risk standardized approach (MRSA). In 2019, the grandfathered securitization regulatory framework was applied to positions that were issued until December 31, 2018. Whereas the new regulatory framework was only applied to non-grandfathered positions issued from January 1, 2019. For both these frameworks, 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. 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 general 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.

Please refer to section "Article 455 (a)(i) CRR - Characteristics of the market risk models" on page 144 of this report for general information on our market risk quantification approaches.

## Article 449 (i) CRR - SSPEs related to institution

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. Approximately 5 % 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 2019, specifically Note 1 “Significant accounting policies and critical accounting estimates” on page 235. 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 236, “Financial assets” on page 241-245 and “Financial liabilities” on page 245-246 and “Derecognition of financial assets and liabilities” on page 253, see also Note 13 “Financial instruments carried at fair value” on page 282. 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 exposures” on page 166 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 162.

## Article 449 (l) CRR - Internal Assessment Approach

As the Group ceased the use of ABCP programs in 2015, there are no securitizations positions subject to the Internal Assessment Approach as of December 31, 2019. For a description of the RWA calculation approaches used for securitization positions please refer to the section “Article 449 (h) CRR - RWA calculation approaches for securitization positions” on page 162 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.

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 € 42.5 billion total outstanding securitized exposure reported as of December 31, 2019 in the table below as originator, the amount retained was € 35.1 billion reflecting a decrease in both outstanding securitized as well as retained exposures due to a lower business volume in our synthetic banking book positions and data quality improvements. For December 31, 2018 these exposures amounted to € 44.1 billion and € 35.5 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, 2019, our retained or re-purchased exposure of the € 6 billion total outstanding exposure securitized shown in the sponsor columns including multi-seller transactions was € 2.4 billion. The remaining exposure is held by third parties. As of December 31, 2018, our total outstanding exposure securitized resulting from sponsoring activities amounted to € 10.3 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, 2019				Dec 31, 2018			
	Originator		Sponsor <sup>1</sup>		Originator		Sponsor <sup>1</sup>	
	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic
Residential mortgages	3,100	0	1,222	0	3,277	0	3,828	0
Commercial mortgages	3,097	0	4,765	0	3,213	0	5,230	0
Credit card receivables	0	0	0	0	0	0	0	0
Leasing	10	0	0	0	97	0	0	0
Loans to corporates or SMEs (treated as corporates) <sup>2</sup>	315	33,622	0	0	870	34,285	1,270	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	2,348	0	0	0	2,331	0	0
<b>Total outstanding exposures securitized<sup>3</sup></b>	<b>6,521</b>	<b>35,970</b>	<b>5,987</b>	<b>0</b>	<b>7,457</b>	<b>36,616</b>	<b>10,327</b>	<b>0</b>

<sup>1</sup> As of December 31, 2019 included under sponsor is the amount € 4.7 billion of multi-seller related securitized exposures, of which we have originated € 2.3 billion, and therefore have also included this amount under originator. For December 31, 2018 the amounts were € 5.0 billion and € 2.5 billion respectively.

<sup>2</sup> SMEs are small- or medium-sized enterprises.

<sup>3</sup> 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. 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 € 660 million decrease in outstanding exposure of originator traditional transactions is due to less securitization activity. Of the € 87 billion multi-seller related securitized exposures noted under sponsor, we have originated € 31.9 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, 2019				Dec 31, 2018			
	Originator		Sponsor <sup>1</sup>		Originator		Sponsor <sup>1</sup>	
	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic
Residential mortgages	1,118	0	1,699	0	3,320	0	4,651	0
Commercial mortgages	40,388	0	87,326	0	38,196	0	56,944	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) <sup>2</sup>	97	0	0	0	0	0	0	0
Consumer loans	0	0	0	0	0	0	0	0
Trade receivables	0	0	0	0	0	0	0	0
Covered bonds	1	0	0	0	0	0	0	0
Other liabilities	0	0	0	0	0	0	0	0
Other assets	0	0	0	0	748	0	0	0
<b>Total outstanding exposures securitized<sup>3</sup></b>	<b>41,603</b>	<b>0</b>	<b>89,025</b>	<b>0</b>	<b>42,263</b>	<b>0</b>	<b>61,595</b>	<b>0</b>

<sup>1</sup> As of December 31, 2019 included under sponsor is the amount € 87 billion of multi-seller related securitized exposures, of which we have originated € 31.9 billion, and therefore have also included this amount under originator. For December 31, 2018 the amounts were € 57.0 billion and € 22.2 billion respectively.

<sup>2</sup> SMEs are small- or medium-sized enterprises.

<sup>3</sup> 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 € 2.8 million 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 ≥ 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	5,244	63	5,307	42	151	464	417	880	99
Commercial mortgages	1,022	237	1,259	4	23	422	760	1,182	75	19
Credit card receivables	567	579	1,147	0	20	28	29	57	0	4
Leasing	3,894	903	4,797	0	62	12	4	16	0	1
Loans to corporates or SMEs (treated as corporates) <sup>1</sup>	52,124	948	53,073	44	462	746	201	947	74	55
Consumer loans	5,953	2,206	8,159	8	118	234	61	295	0	10
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	3,331	835	4,166	5	92	17	309	326	7	26
<b>Total securitization positions retained or purchased<sup>2</sup></b>	<b>72,136</b>	<b>5,772</b>	<b>77,908</b>	<b>103</b>	<b>929</b>	<b>1,922</b>	<b>1,781</b>	<b>3,703</b>	<b>255</b>	<b>147</b>

<sup>1</sup> SMEs are small- or medium-sized enterprises.

<sup>2</sup> 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 ≥ 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
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) <sup>1</sup>	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
<b>Total securitization positions retained or purchased<sup>2</sup></b>	<b>63,570</b>	<b>6,191</b>	<b>69,762</b>	<b>200</b>	<b>740</b>	<b>4,168</b>	<b>1,070</b>	<b>5,238</b>	<b>391</b>	<b>415</b>

<sup>1</sup> SMEs are small- or medium-sized enterprises.

<sup>2</sup> 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 € 8.1 billion or 12 % throughout the year 2019. The increase was mainly driven by investments in the exposure class "Loans to corporates or SMEs (treated as corporates)". A rise in the exposure class "Leasing" supported the overall development.

Following the increase in regulatory exposure values and more conservative risk weights as part of the new regulatory securitization framework, capital requirements increased by 26% to € 929 million.



Within the trading book, the securitization exposure decreased by € 1.5 billion or 29% basically across all exposure types. Despite the impact from the new regulatory securitization framework, the capital requirement decreased by € 268 million in 2019 due to active portfolio management.

#### Securitization positions retained or purchased by region (exposure amount)

in € m.	Dec 31, 2019		Dec 31, 2018	
	Banking Book	Trading Book	Banking Book	Trading Book
Europe	15,150	879	13,387	1,771
Americas	59,959	2,034	54,022	2,506
Asia/Pacific	2,785	785	888	848
Other	14	5	1,465	113
<b>Total securitization positions retained or purchased<sup>1</sup></b>	<b>77,908</b>	<b>3,703</b>	<b>69,762</b>	<b>5,238</b>

<sup>1</sup> 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 increases across all regions in the banking book were a result of generally higher business volumes. In "Other" primarily 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 across all regions was driven by the aforementioned active portfolio management.

#### (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, 2019		Dec 31, 2018	
	Banking Book	Trading Book	Banking Book	Trading Book
Residential mortgages	0	0	0	0
Commercial mortgages	0	1,748	0	902
Credit card receivables	0	0	0	0
Leasing	0	0	0	0
Loans to corporates or SMEs (treated as corporates) <sup>1</sup>	1,783	0	3,933	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
<b>Outstanding exposures awaiting securitization</b>	<b>1,783</b>	<b>1,748</b>	<b>3,933</b>	<b>902</b>

<sup>1</sup> SMEs are small- or medium-sized enterprises.

As of December 31, 2019 we held "Loans to corporates or SMEs (treated as corporates)" of € 1.8 billion in the Banking book and "Commercial mortgages" of € 1.7 billion in the Trading 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 167.

#### (vi) - Amount of exposures securitized and recognized gains or losses on sales

The 2019 year-end amounts in the tables below show a decrease in our securitization activity in the banking book compared with 2018. The lower exposure originated via synthetic securitizations in 2019 compared to 2018 is a result of the introduction of the new securitization framework as well as lower origination activity.

Securitization activity – Total outstanding exposures securitized (i.e., the underlying pools) by exposure type within the banking book

in € m.	Dec 31, 2019		Originator 2019	Sponsor Dec 31, 2019	
	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	Traditional	Synthetic
Residential mortgages	0	0	0	115	0
Commercial mortgages	390	0	3	0	0
Credit card receivables	0	0	0	0	0
Leasing	0	0	0	0	0
Loans to corporates or SMEs (treated as corporates) <sup>1</sup>	315	3,995	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
<b>Total Outstanding Exposures Securitized<sup>2</sup></b>	<b>705</b>	<b>3,995</b>	<b>3</b>	<b>115</b>	<b>0</b>

<sup>1</sup> SMEs are small- or medium-sized enterprises.

<sup>2</sup> 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, 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) <sup>1</sup>	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
<b>Total Outstanding Exposures Securitized<sup>2</sup></b>	<b>147</b>	<b>13,935</b>	<b>1</b>	<b>3,421</b>	<b>0</b>

<sup>1</sup> SMEs are small- or medium-sized enterprises.

<sup>2</sup> 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 decreased by 11.4 % to € 8.7 billion which is in line with the business strategy for the year. The origination activity also drove an increase 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.	Dec 31, 2019		Originator 2019	Sponsor <sup>1</sup> Dec 31, 2019	
	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	Traditional	Synthetic
Residential mortgages	427	0	1	0	0
Commercial mortgages	8,308	0	113	27,457	0
Credit card receivables	0	0	0	0	0
Leasing	0	0	0	0	0
Loans to corporates or SMEs (treated as corporates) <sup>2</sup>	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
<b>Total Outstanding Exposures Securitized<sup>3</sup></b>	<b>8,735</b>	<b>0</b>	<b>0</b>	<b>27,457</b>	<b>0</b>

<sup>1</sup> Included under sponsor is the amount € 27.5 billion exposures securitized, of which we originated € 7.7 billion, also included under originator.

<sup>2</sup> SMEs are small- or medium-sized enterprises.

<sup>3</sup> 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.	Dec 31, 2018		Originator 2018	Sponsor <sup>1</sup> Dec 31, 2018	
	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	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) <sup>2</sup>	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
<b>Total Outstanding Exposures Securitized<sup>3</sup></b>	<b>9,863</b>	<b>0</b>	<b>51</b>	<b>20,074</b>	<b>0</b>

<sup>1</sup> Included under sponsor is the amount € 19.3 billion exposures securitized, of which we originated € 7 billion, also included under originator.

<sup>2</sup> SMEs are small- or medium-sized enterprises.

<sup>3</sup> 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 broken down by risk-weight bands.

#### Banking book securitization positions retained or purchased by risk weight band

in € m.	Dec 31, 2019			Jun 30, 2019		
	Exposure amount	Capital requirements IRBA <sup>1</sup>	Capital requirements standardized approach	Exposure amount	Capital requirements IRBA <sup>1</sup>	Capital requirements standardized approach
≤ 10 %	50,984	311	1	56,695	327	1
> 10 ≤ 20 %	22,187	173	96	15,590	136	56
> 20 ≤ 50 %	2,770	39	32	1,747	24	20
> 50 ≤ 100 %	1,339	33	56	1,369	45	43
> 100 ≤ 350 %	471	27	36	184	8	12
> 350 ≤ 650 %	46	15	0	77	25	0
> 650 < 1,250 %	7	4	0	0	0	0
≥ 1,250% ≤ 1,325 %	103	96	10	165	142	23
<b>Total securitization positions retained or purchased</b>	<b>77,908</b>	<b>698</b>	<b>231</b>	<b>75,826</b>	<b>707</b>	<b>154</b>

<sup>1</sup> 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 3 % or € 2.1 billion, the capital requirements for securitization positions in the banking book increased by 8 % or 68 million. This was primarily driven by investor activities in senior tranches treated under the new securitization framework which are subject to the new risk weight floor of 15 %. The introduction of the new framework including a risk weight floor of 15 % instead of 7 % is also causing the shift of exposures from the risk weight bucket ≤ 10 % into the > 10 ≤ 20 % bucket.

As of December 31, 2019 the capital requirements for 34 % of retained securitization positions in the banking book were calculated under the new securitization framework. Overall, 84 % of the securitization exposures in the banking book were treated according to the advanced approaches Supervisory Formula Approach ("SFA") and Securitization Internal Ratings Based Approach (SEC-IRBA).

In the following sections we present the EAD and capital requirements for retained and purchased securitization positions provided separately for each regulatory RWA calculation approach and broken down by risk weight bands. The tables provided for yearend 2019 are comprised of two elements – the grandfathered securitization framework elements (e.g. SFA) presented on the left hand side of the tables and the new securitization framework elements (e.g. SEC-IRBA approach) presented on the right hand side of the tables. We then provide comparative numbers for yearend 2018 which are based solely on the grandfathered securitization framework (e.g. SFA only).

Banking book securitization positions retained or purchased by risk weight bands subject to the IRBA-Rating based approach (RBA) and SEC-ERBA

in € m.	Dec 31, 2019							
	IRBA-RBA <sup>1</sup>				SEC-ERBA			
	Exposure amount		Capital requirements		Exposure amount		Capital requirements	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	974	0	12	0	157	0	1	0
> 10 ≤ 20 %	237	0	2	0	227	0	4	0
> 20 ≤ 50 %	650	0	18	0	19	0	0	0
> 50 ≤ 100 %	114	0	6	0	590	0	37	0
> 100 ≤ 350 %	8	0	1	0	39	0	7	0
> 350 ≤ 650 %	1	0	0	0	0	0	0	0
> 650 < 1,250 %	7	0	4	0	0	0	0	0
≥ 1,250% ≤ 1,325 %	75	4	77	4	0	0	0	0
<b>Total securitization positions retained or purchased</b>	<b>2,067</b>	<b>4</b>	<b>122</b>	<b>4</b>	<b>1,033</b>	<b>0</b>	<b>49</b>	<b>0</b>

<sup>1</sup> After considering value adjustments according to Article 266 (1,2) CRR.

in € m.	Dec 31, 2018			
	IRBA-RBA <sup>1</sup>			
	Exposure amount		Capital requirements	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	915	0	6	0
> 10 ≤ 20 %	935	0	10	0
> 20 ≤ 50 %	944	0	22	0
> 50 ≤ 100 %	471	0	30	0
> 100 ≤ 350 %	7	0	1	0
> 350 ≤ 650 %	3	0	1	0
> 650 < 1,250 %	0	0	0	0
≥ 1,250% ≤ 1,325 %	126	6	83	7
<b>Total securitization positions retained or purchased</b>	<b>3,403</b>	<b>6</b>	<b>152</b>	<b>7</b>

<sup>1</sup> After considering value adjustments according to Article 266 (1,2) CRR.

Exposures subject to the securitization IRBA-Ratings Based (IRBA-RBA) and Securitization-External Ratings Based Approach (SEC-ERBA) decreased by 9 % or € 303 million compared to December 31, 2018. This was mainly driven by the new securitization framework which moves the external ratings based method down in the hierarchy.

Banking book securitization positions retained or purchased by risk weight band subject to the IRBA-Supervisory formula approach (SFA) and SEC-IRBA

in € m.	Dec 31, 2019							
	IRBA-SFA <sup>1</sup>				SEC-IRBA			
	Exposure amount		Capital requirements		Exposure amount		Capital requirements	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	48,448	0	290	0	1,404	0	9	0
> 10 ≤ 20 %	194	0	2	0	14,056	0	169	0
> 20 ≤ 50 %	13	0	0	0	737	0	21	0
> 50 ≤ 100 %	57	0	3	0	290	0	23	0
> 100 ≤ 350 %	50	3	8	0	66	0	9	0
> 350 ≤ 650 %	41	0	14	0	0	0	0	0
> 650 < 1,250 %	0	0	0	0	0	0	0	0
1,250 %	6	0	6	0	0	0	0	0
<b>Total securitization positions retained or purchased</b>	<b>48,810</b>	<b>3</b>	<b>324</b>	<b>0</b>	<b>16,553</b>	<b>0</b>	<b>230</b>	<b>0</b>

<sup>1</sup> After considering value adjustments according to Article 266 (1,2) CRR.

<sup>2</sup> Including capital requirements for maturity mismatch of synthetic securitizations by risk weight band defined as notional weighted average risk weight of the underlying pool.

in € m.	Dec 31, 2018			
	IRBA-SFA'			
	Exposure amount		Capital requirements	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	62,864	0	372	0
> 10 ≤ 20 %	307	0	3	0
> 20 ≤ 50 %	838	0	17	0
> 50 ≤ 100 %	84	0	3	0
> 100 ≤ 350 %	28	0	5	0
> 350 ≤ 650 %	62	0	27	0
> 650 < 1,250 %	62	0	35	0
1,250 %	23	0	23	0
<b>Total securitization positions retained or purchased</b>	<b>64,268</b>	<b>0</b>	<b>485</b>	<b>0</b>

Banking Book exposure subject to the IRBA-Supervisory Formula (IRBA-SFA) or Securitization-Internal Ratings Based Approach (SEC-IRBA) slightly increased by € 1.1 billion or 2 % to € 65.4 billion in 2019, mainly driven by higher investor activity in senior tranches. Capital requirements increased by € 69 million or 14 % mainly due to the new risk weight floors.

The Credit Risk Standardized Approach ("CRSA") and Securitization-Standardized Approach (SEC-SA) are used for securitization positions where the underlying portfolio (CRSA > 50 % / SEC-SA > 5 %) 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) and SEC-SA

in € m.	Dec 31, 2019							
	CRSA				SEC-SA			
	Exposure amount		Capital requirements		Exposure amount		Capital requirements	
	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 %	362	0	6	0	7,111	0	87	0
> 20 ≤ 50 %	73	0	3	0	1,278	0	29	0
> 50 ≤ 100 %	27	0	2	0	261	0	17	0
> 100 ≤ 350 %	93	1	11	0	210	0	25	0
> 350 ≤ 650 %	4	0	1	0	0	0	0	0
> 650 < 1,250 %	0	0	0	0	0	0	0	0
1,250 %	15	0	15	0	3	0	3	0
<b>Total securitization positions retained or purchased</b>	<b>574</b>	<b>1</b>	<b>38</b>	<b>0</b>	<b>8,863</b>	<b>0</b>	<b>161</b>	<b>0</b>

in € m.	Dec 31, 2018			
	CRSA			
	Exposure amount		Capital requirements	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	0	0	0	0
> 10 ≤ 20 %	1,232	0	20	0
> 20 ≤ 50 %	127	0	5	0
> 50 ≤ 100 %	672	0	42	0
> 100 ≤ 350 %	10	0	1	0
> 350 ≤ 650 %	0	0	0	0
> 650 < 1,250 %	0	0	0	0
1,250 %	44	0	29	0
<b>Total securitization positions retained or purchased</b>	<b>2,085</b>	<b>0</b>	<b>97</b>	<b>0</b>

Exposure subject to CRSA or SEC-SA increased significantly by € 7.4 billion or 352 % following the SEC-SA being placed second in the hierarchy of methods of the new securitization framework. Especially for securitized pools which are mixed in terms of standard and advance approach assets the SEC-SA was applied given that the CRSA threshold was significantly lowered from < 50 % to < 5 %.

## Trading book securitization exposure

The following table presents the retained or purchased trading book securitizations and re-securitizations 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 page 162 in our annual Pillar 3 Report 2019.

#### Trading book securitization positions retained or purchased by risk weight band subject to the market risk standardized approach (MRSA)

in € m.	Dec 31, 2019				Jun 30, 2019			
	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 %	948	0	4	0	494	0	3	0
> 10 ≤ 20 %	1,463	0	18	0	2,016	0	20	0
> 20 ≤ 50 %	206	1	7	0	173	4	6	0
> 50 ≤ 100 %	542	0	32	0	587	1	38	0
> 100 ≤ 350 %	243	0	35	0	144	0	17	0
> 350 ≤ 650 %	43	1	14	1	168	0	41	0
> 650 < 1,250 %	1	0	1	0	11	0	3	0
1,250 %	255	0	35	0	292	19	139	2
<b>Total securitization positions retained or purchased</b>	<b>3,701</b>	<b>2</b>	<b>146</b>	<b>1</b>	<b>3,886</b>	<b>24</b>	<b>267</b>	<b>2</b>

Compared to June 2019, the exposure of trading book securitization and re-securitization positions decreased by € 207 million or 5 % to € 3.7 billion mainly due to a reduction in the securitized bond inventory. Alongside with this cutback the capital requirements for securitization and re-securitization positions reduced by € 122 million, predominantly driven by disposals in the risk buckets between 350 % and 1,250 %. For 6 % of the securitization positions the own funds requirement cap of Article 335 CRR is applied, which results in a capital requirement saving of € 233 million, which is realized mainly in the 1,250 % risk weight bucket.

## Article 449 (o)(ii) CRR - Retained or purchased re-securitization exposures for banking and trading book

In 2019 re-securitization positions stayed unchanged at very low levels.

#### Re-securitization positions retained or purchased (exposure amount)

in € m.	Dec 31, 2019				Dec 31, 2018			
	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	8	8	2	2	6	6	5	5

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 2019 and 2018 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, 2019	2019	Dec 31, 2018	2018
	Impaired/ past due <sup>1</sup>	Losses	Impaired/ past due <sup>1</sup>	Losses
Residential mortgages	0	0	0	0
Commercial mortgages	0	0	0	2
Credit card receivables	0	0	0	0
Leasing	0	0	0	0
Loans to corporates or SMEs (treated as corporates) <sup>2</sup>	45	0	14	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
<b>Total impaired and past due exposures securitized and losses recognized<sup>3</sup></b>	<b>45</b>	<b>0</b>	<b>14</b>	<b>2</b>

<sup>1</sup> 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.

<sup>2</sup> SMEs are small- or medium-sized entities.

<sup>3</sup> 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 increased to € 45 million in 2019 compared to € 14 million in 2018. Losses recorded by us in 2019 decreased to nearly zero from € 2 million in 2018.

## 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 166.

## 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 2019 on the pages 163 - 204.

## 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).

### Leverage Ratio according to CRR/CRD framework

The non-risk based leverage ratio is intended to act as a supplementary measure to the risk based capital requirements. Its objectives are to constrain the build-up of leverage in the banking sector, helping avoid destabilizing deleveraging processes which can damage the broader financial system and the economy, and to reinforce the risk based requirements with a simple, non-risk based “backstop” measure.

A minimum leverage ratio requirement of 3 % was introduced effective June 2021. From January 1, 2022 an additional leverage ratio buffer requirement of 50 % of the applicable G-SIB buffer rate will apply. It is currently expected that this additional requirement will equal 0.75 %.

We calculate our leverage ratio exposure 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.

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. The Leverage ratio common disclosure table provides the leverage ratio on a fully-loaded and phase-in basis with the fully-loaded and phase-in Tier 1 Capital, respectively, in the numerator. For further details on Tier 1 capital please also refer to the “Regulatory capital composition, prudential filters and deduction items” section in chapter “Own funds” on page 24 in this report.



### Summary reconciliation of accounting assets and leverage ratio exposures

in € bn. (unless stated otherwise)	Dec 31, 2019	Jun 30, 2019
<b>Total assets as per published financial statements</b>	<b>1,298</b>	<b>1,436</b>
Adjustment for entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation	(1)	(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	(188)	(192)
Adjustment for securities financing transactions (SFTs)	6	12
Adjustment for off-balance sheet items (i.e. conversion to credit equivalent amounts of off-balance sheet exposures)	103	101
(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	(50)	(52)
<b>Leverage ratio total exposure measure</b>	<b>1,168</b>	<b>1,304</b>

N/M – Not meaningful

### Leverage ratio common disclosure

in € bn. (unless stated otherwise)	Dec 31, 2019	Jun 30, 2019
<b>On-balance sheet exposures (excluding derivatives and SFTs)</b>		
On-balance sheet items (excluding derivatives, SFTs and fiduciary assets, but including collateral)	869	968
(Asset amounts deducted in determining Tier 1 capital)	(10)	(10)
<b>Total on-balance sheet exposures (excluding derivatives, SFTs and fiduciary assets)</b>	<b>859</b>	<b>958</b>
<b>Derivative exposures</b>		
Replacement cost associated with all derivatives transactions (i.e. net of eligible cash variation margin)	32	35
Add-on amounts for PFE associated with all derivatives transactions (mark-to-market method)	114	143
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)	(35)	(33)
(Exempted CCP leg of client-cleared trade exposures)	(6)	(9)
Adjusted effective notional amount of written credit derivatives	326	379
(Adjusted effective notional offsets and add-on deductions for written credit derivatives)	(318)	(370)
<b>Total derivatives exposures</b>	<b>113</b>	<b>144</b>
<b>SFT exposures</b>		
Gross SFT assets (with no recognition of netting), after adjusting for sales accounting transactions	169	163
(Netted amounts of cash payables and cash receivables of gross SFT assets)	(82)	(75)
Counterparty credit risk exposure for SFT assets	5	13
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
<b>Total securities financing transaction exposures</b>	<b>93</b>	<b>102</b>
<b>Other off-balance sheet exposures</b>		
Off-balance sheet exposures at gross notional amount	281	277
(Adjustments for conversion to credit equivalent amounts)	(178)	(177)
<b>Other off-balance sheet exposures</b>	<b>103</b>	<b>101</b>
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
<b>Capital and total exposure measure</b>		
Tier 1 capital (fully loaded)	48.7	51.1
Leverage ratio total exposure measure	1,168	1,304
Leverage ratio (fully loaded, in %)	4.2	3.9
Tier 1 capital (phase-in)	50.5	54.1
Leverage ratio total exposure measure	1,168	1,304
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, 2019	Jun 30, 2019
<b>Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures)</b>	<b>869</b>	<b>968</b>
of which:		
Trading book exposures	155	212
Banking book exposures	714	756
of which:		
Covered bonds	1	1
Exposures treated as sovereigns	205	227
Exposures to regional governments, MDB, international organizations and PSE not treated as sovereigns	1	1
Institutions	16	17
Secured by mortgages of immovable properties	200	193
Retail exposures	36	35
Corporate	175	174
Exposures in default	7	8
Other exposures (e.g. equity, securitizations, and other non-credit obligation assets)	71	101

## Process used to manage the risk of excessive leverage

As described in the section “Risk management principles” and “Risk governance” on pages 55 - 58 of our Annual Report 2019, 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 65 of our Annual Report 2019.

## Factors that had an impact on the leverage ratio in the second half of 2019

As of December 31, 2019, our fully loaded leverage ratio was 4.2 % compared to 3.9 % as of June 30, 2019, taking into account as of December 31, 2019 a fully loaded Tier 1 capital of € 48.7 billion over an applicable exposure measure of € 1,168 billion (€ 51.1 billion and € 1,304 billion as of June 30, 2019, respectively).

Our leverage ratio according to transitional provisions was 4.3 % as of December 31, 2019 (4.2 % as of June 30, 2019), calculated as Tier 1 capital according to transitional rules of € 50.5 billion over an applicable exposure measure of € 1,168 billion (€ 54.1 billion and € 1,304 billion as of June 30, 2019, respectively).

In the second half of 2019, our leverage exposure decreased by € 136 billion to € 1,168 billion. On-balance sheet exposures (excluding derivatives and SFTs) decreased by € 99 billion reflecting the development of our balance sheet: non-derivative trading assets decreased by € 53 billion, pending settlements were € 32 billion lower due to seasonally low year-end levels, cash and central bank / interbank balances decreased by € 24 billion. This was partly offset by loans growth of € 14 billion. Furthermore, the leverage exposure related to derivatives decreased by € 31 billion (€ 29 billion excluding deductions of receivables assets for cash variation margin provided in derivatives transactions) mainly driven by lower add-ons for potential future exposure. SFT related items (securities purchased under resale agreements, securities borrowed and receivables from prime brokerage) decreased by € 8 billion driven by lower add-ons for counterparty credit risk. Off-balance sheet exposures slightly increased by € 2 billion.

The increase in leverage exposure in the second half of 2019 included a positive foreign exchange impact of € 12 billion mainly due to the depreciation of the Euro against the U.S. dollar. The effects from foreign exchange rate movements are embedded in the movement of the leverage exposure items discussed in this section.

For main drivers of the Tier 1 capital development please refer to section "Own funds" on page 24 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. Following the European Commission's disclosure guidance for asset encumbrance we have introduced the asset quality indicator concept "high-quality liquid assets" (HQLA) as defined under the Delegated Act on Liquidity Coverage Ratio firstly for June 30, 2019. It replaces the central bank eligibility-concept we applied for earlier disclosures on and before December 31, 2018. Consequently, the comparative disclosure as of June 30, 2019 is based on the median of the last two quarterly data points while the current disclosure as of December 31, 2019 is based on the median of the last four quarter data points.

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 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 2019 in Note 20 "Transfer of financial assets, assets pledged and received as collateral" on page 306 of the Consolidated Financial Statements, and restricted assets held to satisfy obligations to insurance companies' policy holders are included within Note 37 "Information on subsidiaries" on page 359 of the Consolidated Financial Statements.

### EU AE1 – Encumbered and unencumbered assets

		Dec 31, 2019							
		010	030	040	050	060	080	090	100
		Encumbered assets				Unencumbered assets			
		Carrying amount		Fair value		Carrying amount		Fair value	
in € bn.			of which notionally eligible EHQLA and HQLA		of which notionally eligible EHQLA and HQLA		of which EHQLA and HQLA		of which EHQLA and HQLA
030	Equity instruments	29.1	16.7	–	–	14.1	4.9	–	–
040	Debt securities	57.6	44.3	57.6	44.3	107.5	70.2	107.5	70.2
	of which:								
050	Covered bonds	0.5	0.3	0.5	0.3	3.6	3.3	3.6	3.3
060	Asset-backed securities	1.2	0	1.2	0	3.0	0.4	3.0	0.4
070	Issued by general governments	43.1	40.7	43.1	40.7	65.7	60.7	65.7	60.7
080	Issued by financial corporations	10.5	2.0	10.5	2.0	26.8	5.1	26.8	5.1
090	Issued by non-financial corporations	3.6	1.1	3.6	1.1	12.2	0.6	12.2	0.6
120	Other assets	134.0	11.4	–	–	1,126.4	143.2	–	–
	of which:								
122	Loans other than loans on demand	74.9	0	–	–	373.3	0	–	–
123	Securities purchased under resale agreements and securities borrowed	0	0	–	–	84.8	0	–	–
124	Cash margin receivables / prime brokerage receivables	46.6	0	–	–	9.9	0	–	–
010	Total	228.4	73.2	–	–	1,201.1	218.6	–	–

		Jun 30, 2019							
		010	030	040	050	060	080	090	100
		Encumbered assets				Unencumbered assets			
		Carrying amount		Fair value		Carrying amount		Fair value	
			of which notionally eligible EHQLA and HQLA		of which notionally eligible EHQLA and HQLA		of which EHQLA and HQLA		of which EHQLA and HQLA
in € bn.									
030	Equity instruments	43.0	23.6	–	–	16.6	6.5	–	–
040	Debt securities	58.3	44.3	58.3	44.3	102.3	68.2	102.3	68.2
of which:									
050	Covered bonds	0.6	0.4	0.6	0.4	2.2	1.9	2.2	1.9
060	Asset-backed securities	1.9	0.5	1.9	0.5	1.4	0.1	1.4	0.1
070	Issued by general governments	43.1	40.7	43.1	40.7	65.1	60.1	65.1	60.1
080	Issued by financial corporations	11.1	2.1	11.1	2.1	23.1	5.1	23.1	5.1
090	Issued by non-financial corporations	4.0	1.2	4.0	1.2	12.8	0.6	12.8	0.6
120	Other assets	133.8	11.4	–	–	1,082.1	154.2	–	–
of which:									
121	Loans other than loans on demand	75.9	0	–	–	366.1	0	–	–
122	Securities purchased under resale agreements and securities borrowed	0	0	–	–	87.9	0	–	–
123	Cash margin receivables / prime brokerage receivables	44.7	0	–	–	11.7	0	–	–
124									
010	Total	235.2	79.2	–	–	1,201.1	228.9	–	–

#### EU AE2 – Collateral received

		Dec 31, 2019			
		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 notionally eligible EHQLA and HQLA		of which EHQLA and HQLA
in € bn.					
140	Loans on demand	0	0	0	0
150	Equity instruments	51.0	33.0	4.7	2.4
160	Debt securities	181.3	159.4	34.1	24.4
of which:					
170	Covered bonds	1.3	1.3	0.5	0.5
180	Asset-backed securities	1.5	0	4.2	0.2
190	Issued by general governments	158.1	154.6	27.5	23.1
200	Issued by financial corporations	15.7	4.5	5.9	0.9
210	Issued by non-financial corporations	7.5	1.2	2.2	0.2
220	Loans and advances other than loans on demand	0	0	3.7	0
230	Other collateral received	0	0	0	0
130	Total collateral received	236.2	200.6	46.0	27.6
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	–	–	2.3	0.3
250	Total Assets, collateral received and own debt securities issued	464.6	273.9	–	–

		Jun 30, 2019			
		010	030	040	060
				Unencumbered	
		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 notionally eligible EHQLA and HQLA		of which EHQLA and HQLA	
in € bn.					
140	Loans on demand	0	0	0	0
150	Equity instruments	89.8	58.4	7.8	3.1
160	Debt securities	181.3	159.1	34.1	24.4
of which:					
170	Covered bonds	1.2	1.1	0.5	0.5
180	Asset-backed securities	1.9	0.6	3.8	0.5
190	Issued by general governments	158.1	154.6	27.5	23.1
200	Issued by financial corporations	13.9	3.1	4.1	0.8
210	Issued by non-financial corporations	9.3	1.4	2.3	0.2
220	Loans and advances other than loans on demand	0	0	4.1	0
230	Other collateral received	0	0	0	0
130	<b>Total collateral received</b>	<b>271.1</b>	<b>217.5</b>	<b>46.0</b>	<b>27.6</b>
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	–	–	2.4	0.3
250	<b>Total Assets, collateral received and own debt securities issued</b>	<b>506.3</b>	<b>296.7</b>	<b>–</b>	<b>–</b>

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 2019, € 228.4 billion of the Group's on-balance sheet assets were encumbered. These assets primarily relate to firm financing of trading inventory and other securities, funding (i.e. Pfandbriefe and covered bonds) secured against loan collateral and cash collateral for derivative margin requirements.

For December 2019, the Group had received securities as collateral with a fair value of € 282.2 billion, of which € 236.2 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.

'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.

#### EU AE3 – Sources of encumbrance

		Dec 31, 2019		Jun 30, 2019	
		010	030	010	030
		Assets, collateral received and own debt securities issued other than covered bonds and ABSs encumbered		Assets, collateral received and own debt securities issued other than covered bonds and ABSs encumbered	
		Matching liabilities, contingent liabilities or securities lent		Matching liabilities, contingent liabilities or securities lent	
in € bn.					
010	Carrying amount of selected financial liabilities	235.1	249.8	231.0	245.1
011	of which:				
012	Derivatives	59.1	60.6	57.0	58.6
013	Repurchase agreements	112.3	115.0	107.1	109.4
014	Collateralized central bank deposits and covered bonds issued	48.2	58.3	48.4	58.6

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 142.14 % (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, 2019 stands at 141.18 % compared to 139.70 % as of December 31, 2018.

## Concentration of funding and liquidity sources:

For an overview of funding concentration and liquidity sources please refer to the section "Liquidity risk exposure" in the Annual Report 2019 on page 151. The information is contained 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 potential posting of additional collateral as a result of a 3 notch downgrade of DB's credit rating (as per regulatory requirements).

## Currency mismatch in the LCR:

The LCR is calculated in all significant currencies (make up at least 5 % of the total Balance Sheet EUR, USD and GBP). No explicit LCR risk appetite is set for specific currencies.

## Approach to centralized group liquidity management and individual legal entity liquidity management:

Please refer to the section "Liquidity risk management" on page 90 in the Annual Report 2019.

## 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 each quarter. We do not consider anything else relevant for disclosure.

### EU LIQ1 - LCR disclosure template

in € b.		Total unweighted value (average)				Total weighted value (average)			
Quarter ending on		Dec 31, 2019	Sep 30, 2019	Jun 30, 2019	Mar 31, 2019	Dec 31, 2019	Sep 30, 2019	Jun 30, 2019	Mar 31, 2019
Number of data points used in the calculation of averages		12	12	12	12	12	12	12	12
<b>High-quality liquid assets</b>									
1	Total high-quality liquid assets (HQLA)	–	–	–	–	219	228	235	243
<b>Cash-outflows</b>									
2	Retail deposits and deposits from small business costumers	181	182	183	182	17	17	17	17
of which:									
3	Stable deposits	101	99	98	97	5	5	5	5
4	Less stable deposits	81	83	86	86	12	12	12	12
5	Unsecured wholesale funding	220	216	212	210	96	95	93	90
of which:									
6	Operational deposits (all counterparties) and deposits in network of cooperative banks	84	85	86	90	21	21	21	22
7	Non-operational deposits (all counterparties)	134	128	123	118	73	72	70	66
8	Unsecured debt	2	2	2	2	2	2	2	2
9	Secured wholesale funding	–	–	–	–	23	27	32	34
10	Additional requirements	216	216	216	223	87	88	90	95
of which:									
11	Outflows related to derivative exposures and other collateral requirements	43	44	46	51	43	43	45	50
12	Outflows related to loss of funding on debt products	0	0	0	0	0	0	0	0
13	Credit and liquidity facilities	173	171	170	171	44	44	45	45
14	Other contractual funding obligations	43	45	45	47	5	6	7	8
15	Other contingent funding obligations	123	132	141	176	11	14	18	20
16	Total cash outflows	–	–	–	–	239	247	257	266
<b>Cash - inflows</b>									
17	Secured lending (e.g. reverse repos)	248	254	259	264	22	26	32	35
18	Inflows from fully performing exposures	56	53	51	47	43	41	38	34
19	Other cash inflows	28	29	31	35	28	29	31	35
EU	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	–	–	–	–	9	8	7	7
EU	Excess inflows from a related specialized credit institution	–	–	–	–	0	0	0	0
19b		–	–	–	–	0	0	0	0
20	Total cash inflows	332	336	341	347	85	87	93	97
of which:									
EU	Fully exempt inflows	0	0	0	0	0	0	0	0
20a		0	0	0	0	0	0	0	0
EU	Inflows subject to 90 % cap	0	0	0	0	0	0	0	0
20b		0	0	0	0	0	0	0	0
EU	Inflows subject to 75 % cap	295	292	290	294	85	87	93	97
20c		295	292	290	294	85	87	93	97
Total adjusted value									
21	Liquidity buffer	–	–	–	–	219	228	235	243
22	Total net cash outflows	–	–	–	–	154	160	163	168
23	Liquidity coverage ratio (%)	–	–	–	–	142	142	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).

The Capital Requirements Regulation II (“CRR2”), the regulation which defines and implements the NSFR for the EU, was finalized in June 2019. Based on the published CRR II text, NSFR compliance will become effective on the 28 June, 2021 with no transition period, i.e. full implementation at 100 %. The EBA published a consultation on updated supervisory reporting in October, 2019, which included a draft template for NSFR monitoring in line with the final outcome as per CRR II. The template is still to be finalized by the EBA (consultation period closed January, 2020) and is expected to ‘go live’ in June 2021.



## 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 demand for business risk by business division

in € m.	Dec 31, 2019	Dec 31, 2018	2019 increase (decrease) from 2018	
			in € m.	in %
Corporate Bank	195	141	54	38
Investment Bank	4,914	2,315	2,599	112
Private Bank	71	29	43	148
Asset Management	0	0	0	N/M
Capital Release Unit	20	1,065	(1,045)	(98)
Corporate & Other	1,174	1,208	(34)	(3)
<b>Total</b>	<b>6,374</b>	<b>4,758</b>	<b>1,616</b>	<b>34</b>

Economic capital demand for business risk as of December 31, 2019 was € 6.4 billion, representing a € 1.6 billion (34 %) increase compared to December 31, 2018. Strategic risk economic capital of € 4.9 billion was up from € 3.4 billion in 2018, with the increase primarily reflecting the restructuring that took place during 2019 and the associated revised earnings outlook. CRU is considered a non-strategic division of the bank and therefore, other than an immaterial technical redistribution, receives no allocation of group strategic risk economic capital at December 31, 2019. The strategic risk economic capital for CRU at December 31, 2018 relates to those business units that were transferred to CRU in 2019. Economic capital arising on deferred tax assets increased by € 0.1 billion during 2019, reflecting the increase of deferred tax assets on temporary differences largely due to pension related re-measurement effects and other mark-to-market movements.

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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