

Pillar 3 Report 2016



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Introduction

Disclosures according to Pillar 3 of the Basel 3 Capital Framework

The purpose of this Report is to provide Pillar 3 disclosures of the Group as required by the global regulatory framework for capital and liquidity, established by the Basel Committee on Banking Supervision, also known as Basel 3. On European level these are implemented in the disclosure requirements as laid down in Part Eight of the "Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms" (Capital Requirements Regulation, or "CRR") and the "Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms" (Capital Requirements Directive 4, or "CRD 4"). Germany implemented these CRD 4 requirements into national law in Section 26a of the German Banking Act ("Kreditwesengesetz" or "KWG"). Per regulation it is not required to have Pillar 3 disclosures audited. As such the information provided in this Pillar 3 Report is unaudited. In this report, we in particular describe our risk quantification approaches in chapter "Risk Quantification and Measurement" and provide actual results in the subsequent chapters thereafter.

Location of Pillar 3 disclosures

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 2016. 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 location of the required Pillar 3 disclosures either in this Pillar 3 Report or in the Deutsche Bank Annual Report 2016.

Main Pillar 3 disclosures in our Annual Report and Pillar 3 Report

Pillar 3 disclosure topic with reference to CRR-Article	Primary location in our Annual Report	Primary Location in our Pillar 3 Report
Scope of disclosure requirements (Article 431)	N/M	Disclosure Process and Governance
Risk management objectives and policies (Article 435)	Risk and Capital Framework, Risk and Capital Management, Management Board and Supervisory Board, Supervisory Board, Standing Committees, Compliance with the German Corporate Governance Code, Strong commitment to diversity	General Risk Management Framework and Governance, Risk Quantification and Measurement
Scope of application (Article 436)	Introduction	Scope of Application
Own Funds (Article. 437)	Regulatory Capital, Capital Instruments, Minimum capital requirements and additional capital buffers, Development of regulatory capital	Regulatory Capital, reference to our webpage
Capital requirements (Article 438)	Internal Capital Adequacy Assessment Process, Development of risk-weighted assets, Internal Capital Adequacy	Internal Capital Model, Regulatory Capital Requirements and Risk-weighted Assets,
Exposure to counterparty credit risk (Article 439)	Managing and Mitigation of Credit Risk, Liquidity Stress Testing and Scenario Analysis, Credit Risk Exposure	Counterparty Credit Risk, Credit Risk Economic Capital Model, Regulatory Application of Credit Risk Mitigation Techniques; Credit Risk Exposure incl. Counterparty Credit Risk
Capital buffers (Article 440)	Minimum capital requirements and additional capital buffers	Minimum capital requirements and additional capital buffers
Indicators of global systemic importance (Article 441)	Disclosed on our webpage	Disclosed on our webpage
Credit risk adjustments (Article 442)	Asset Quality, Notes "Significant Accounting Policies and Critical Accounting Estimates", "Financial Instruments carried at Fair Value", "Fair Value of Financial Instruments not carried at Fair Value", "Allowance for Credit Losses"	Credit Risk: Regulatory Assessment
Unencumbered assets (Article 443)	Asset Encumbrance	Asset Encumbrance
Use of ECAIs (Article 444)	N/M	Standardized Approach
Exposure to market risk (Article 445)	Trading Market Risk Exposures, Development of Risk-weighted Assets for Market Risk	Development of Risk-weighted Assets incl. Regulatory Capital Requirements and Risk-weighted Assets, Market Risk Exposure
Operational risk (Article 446)	Operational Risk Framework, Operational Risk Exposure, Development of risk-weighted assets for Operational Risk	Operational Risk Measurement, Operational Risk Exposure
Exposures in equities not included in the trading book (Article 447)	Equity Exposure, Notes "Equity Method Investments", "Shareholdings"	Equity Investments
Exposure to interest rate risk on positions not included in the trading book (Article 448)	Nontrading Market Risk	N/M
Exposure to securitization positions (Article 449)	N/M	Securitization, Securitization Measurement, Securitization Details
Remuneration policy (Article 450)	Compensation Report	N/M
Leverage (Article. 451)	Leverage Ratio	Leverage Ratio
Use of the IRB Approach to credit risk (Article 452)	Measuring Credit Risk, Managing and Mitigation of Credit Risk, Credit Risk Exposure	Credit Risk Measurement, Credit Risk Exposure
Use of credit risk mitigation techniques (Article 453)	Managing and Mitigation of Credit Risk, Credit Risk Exposure	Regulatory Application of Credit Risk Mitigation Techniques, Credit Risk Exposure
Use of the Advanced Measurement Approaches to operational Risk (Article 454)	Operational Risk Management, Operational Risk Exposure	Operational Risk Measurement, Operational Risk Exposure
Use of Internal Market Risk Models (Article 455)	Market Risk Management, Trading Market Risk Exposures	Market Risk Measurement, Market Risk Economic Capital Model, Market Risk Exposure

Disclosure Process and Governance

We have applied the Basel 3 capital framework for the majority of our risk exposures on the basis of internal models for measuring credit risk, market risk and operational risk, as approved by the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht or “BaFin”) and the European Central Bank (“ECB”). For purposes of Article 431 CRR, we have adopted a formal risk disclosure policy aiming to support a conclusion 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. 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 2016 appropriately and comprehensively convey our overall risk profile.

Disclosures according to principles and recommendations of the Enhanced Disclosure Task Force (EDTF)

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.

Basel 3 and CRR/CRD 4

In the European Union, the Basel 3 capital framework was implemented by the “Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms” (Capital Requirements Regulation, or “CRR”) published on June 27, 2013, and the “Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms” (Capital Requirements Directive 4, or “CRD 4”) published on June 27, 2013. As a single “rulebook”, the CRR is directly applicable to credit institutions and investment firms in the European Union and provides the grounds for the determination of regulatory own funds, regulatory capital requirements, leverage and liquidity as well as other relevant regulations. In addition, the CRD 4 was implemented into German law by means of further amendments to the German Banking Act (KWG) and the German Solvency Regulation (SolvV) and accompanying regulations. Jointly, these laws and regulations represent the new regulatory framework applicable in Germany.

The new regulatory framework became effective on January 1, 2014, subject to transitional rules. When referring to Deutsche Bank results according to transitional rules we use the term “CRR/CRD 4”. When referring to results according to full application of the final framework (without consideration of applicable transitional methodology) we use the term “CRR/CRD 4 fully loaded”. In some cases, CRR/CRD 4 maintains transitional rules that had been adopted in earlier capital adequacy frameworks through Basel 2 or Basel 2.5. These relate e.g. to the rules permitting the grandfathering of equity investments at a risk-weight of 100 %. In this regard, we assume in our CRR/CRD 4 fully loaded methodology for a limited subset of equity positions that the impact of the expiration of these transitional rules will be mitigated through sales of the underlying assets or other measures prior to the expiration of the grandfathering provisions by end of 2017.

Since 2015 the Common Equity Tier 1 minimum capital requirement applicable to the Group is 4.5 % of risk weighted assets. The development and maintenance of a high quality capital base which should primarily consist of Common Equity Tier 1 reflects one of the core elements of the CRR/CRD 4 framework. Specific regulatory adjustments are also subject to transitional rules. For instance, deductions for deferred tax assets that rely on future profitability or deductions for indirect and synthetic holdings of own instruments and capital instruments issued by financial sector entities are phased in. The phase in percentage was in general 60 % in 2016 compared to 40 % in 2015. It will increase to 80 % in 2017.

In addition to these minimum capital requirements, various capital buffer requirements were phased-in starting 2016 and will become fully effective from 2019 onwards.

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

The CRR/CRD 4 framework further introduced new liquidity standards. The Liquidity Coverage Ratio (LCR) aims to measure a bank's short-term resilience to a severe liquidity stress scenario during a stress period of 30 calendar days. Detailed rules for the calculation of the LCR are set out in the delegated act adopted in October 2014. The LCR became a binding minimum requirement as of October 1, 2015 and is phased in progressively: 60 % from October 1, 2015, 70 % from 2016, 80 % from 2017 and 100 % from 2018, respectively.

The Net Stable Funding Ratio (NSFR) requires banks to maintain a stable funding profile in relation to their on- and off-balance sheet exposures. On November 23, 2016, the European Commission ("EC") proposed a revision of the Capital Requirement Regulation ("CRR") to implement the NSFR into EU legislation. It is expected that a binding minimum ratio for the NSFR will apply from end of 2020.

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

ICAAP, ILAAP and SREP

The Internal Capital Adequacy Assessment Process ("ICAAP") as stipulated in Pillar 2 of Basel 3 requires banks to identify and assess risks, maintain sufficient capital to face these risks and apply appropriate risk-management techniques to maintain adequate capitalization.

Our ICAAP is a group-wide process that involves various functions, policies, procedures, and methodologies. We calculate, assess, and monitor the capital adequacy position at the Group and for ICAAP relevant legal entities to ensure adequate capitalization against our defined risk appetite on an ongoing and forward looking basis both for actual and also stressed conditions. Under Pillar 2, we have adopted a Gone Concern methodology as our primary measure of Internal Capital Adequacy ("ICA") under ICAAP. To determine capital adequacy, we measure our EC demand against the capital supply whereby a ratio of more than 100 % signifies that the total capital is sufficient to cover the capital demand determined by risk positions. Our primary "Gone Concern" approach is supplemented by our "Going Concern" framework. Just like the "Gone Concern" approach, the "Going Concern" approach integrates key risk practices to ensure that the regulatory minimum is maintained even in a stress scenario and closely interplays with our processes related to risk appetite, capital planning, stress testing, and escalation and recovery measures.

The Internal Liquidity Adequacy Assessment Process (“ILAAP”) similar to ICAAP focuses on maintaining sufficient liquidity risk management. We calculate, assess and monitor the liquidity and funding position for both Group and all ILAAP relevant Legal Entities to foster an adequate liquidity and funding management on an ongoing and forward looking basis. The assessment process takes account of the liquidity and funding risks to which the Group is exposed; how these risks are identified, monitored and measured. Within the Group, liquidity and funding risks are managed within a cohesive liquidity risk management and governance framework and the ILAAP aims to demonstrate how this framework operates to effectively manage risks.

The Supervisory Review and Evaluation Process (“SREP”) refers to the common methodology and standards used by the European Central Bank (“ECB”) in its role under the Single Supervisory Mechanism (“SSM”). In accordance with Article 97 of the Capital Requirements Directive (CRD 4), supervisors regularly review the arrangement, strategies, process and mechanisms implemented by banks and evaluate: (a) the risks to which the institution might be exposed; (b) the risks the institution might pose to the financial system in general; and (c) the risks revealed by stress testing. The SREP process encompasses three main elements: a supervisory risk system (RAS); a comprehensive review of the bank’s ICAAP and ILAAP framework; and finally, the evaluation of the bank’s capital and liquidity needs. Any additional bank-specific capital requirements resulting from the SREP are referred to as “Pillar 2” requirements and must be fulfilled in addition to the statutory minimum capital and buffer requirements. The “Pillar 2” requirement must be met with Common Equity Tier 1 capital. Also following the SREP, the ECB may communicate to individual banks an expectation to hold a further “Pillar 2” Common Equity Tier 1 capital add-on, the so-called “Pillar 2” guidance. The ECB has stated that it expects banks to meet the “Pillar 2” guidance although it is not legally binding and failure to meet the “Pillar 2” guidance does not automatically trigger legal action.

MREL and TLAC

Under the Single Resolution Mechanism (“SRM”) Regulation, the Bank Recovery and Resolution Directive (“BRRD”) and the German Recovery and Resolution Act (Sanierungs- und Abwicklungsgesetz, “SAG”) banks in the European Union (“EU”) are required to meet at all times a robust minimum requirement for own funds and eligible liabilities (“MREL”) which is determined on a case-by-case basis by the competent resolution authority. In addition, on November 9, 2015, the Financial Stability Board (“FSB”) published a standard that will require, when implemented as law, global systemically important banks (“G-SIBs”) to meet a new firm-specific minimum requirement for total loss-absorbing capacity (“TLAC”) starting on January 1, 2019. Both the TLAC and MREL requirements are specifically designed to require banks to maintain a sufficient amount of instruments which are eligible to absorb losses in resolution with the aim of ensuring that failing banks can be resolved without recourse to taxpayers’ money.

On November 23, 2016, the European Commission (“EC”) proposed a revision of the Capital Requirement Regulation (“CRR”) to implement TLAC into EU legislation. In addition, it proposed amendments to the BRRD and the SRM Regulation. Under the Commission’s CRR revision proposal, the loss absorbency regime for EU Global Systemically Important Institutions (“G-SIIs”) would be closely aligned with the international TLAC term sheet. It introduces a minimum requirement of 16 percent of Risk Weighted Assets (“RWAs”) or 6 percent of leverage exposure by January 1, 2019; and 18 percent of RWAs and 6.75 percent of leverage exposure by 2022. The resolution authority would be able to request a firm-specific add-on if deemed necessary. For non-G-SIIs banks, the MREL would still be set on a case-by-case basis.

Furthermore, under the German Banking Act, as amended by the Resolution Mechanism Act, specially defined senior unsecured debt instruments issued by German banks rank junior to other senior liabilities, without constituting subordinated debt, in insolvency proceedings opened on or after January 1, 2017.

Scope of Application

Scope of the Regulatory Consolidation

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

Insurance companies and companies outside the banking and financial sector are not consolidated in the regulatory group of institutions. In case a regulatory group of institutions and its subsidiaries and participations in the insurance sector are classified as a ‘financial conglomerate’, the German Act on the Supervision of Financial Conglomerates (Finanzkonglomerate-Aufsichtsgesetz) is applicable according to which insurance companies have to be included in an additional capital adequacy calculation (also referred to as “solvency margin”). We were designated by the BaFin as a financial conglomerate in November 2007. With effect from December 30, 2016 our most material insurance entity Abbey Life Assurance Company Limited has been sold. Given that our remaining insurance sector entities are not significant, we have initiated a re-assessment of Deutsche Bank’s financial conglomerate status.

As of December 31, 2016, Deutsche Bank AG fully applied the exemptions pursuant to Section 2a (1) KWG in conjunction with Article 7 (3) CRR, Art. 6 (5) CRR and Section 2a (2) KWG in conjunction with Section 25a (1) sentence 3 KWG (so-called “parent waiver”) pursuant to which it may waive the application of provisions on own funds (Part II CRR), capital requirements (Part III CRR), large exposures (Part IV CRR), exposures to transferred credit risks (Part V CRR), leverage (Part VII CRR) and disclosure by institutions (Part VIII CRR) as well as certain risk management requirements (Section 25a (1) sentence 3 KWG) on a stand-alone basis.

Deutsche Bank AG’s subsidiaries Deutsche Bank Privat- und Geschäftskunden AG, norisbank GmbH, Deutsche Bank Europe GmbH and Sal. Oppenheim jr. & Cie. AG & Co. KGaA, which all were consolidated within the Deutsche Bank regulatory group, fully applied the exemptions pursuant to Section 2a(1) KWG in conjunction with Article 7(1) CRR, Art. 6 (5) CRR and Section 2a (2) KWG in conjunction with Section 25a (1) sentence 3 KWG (so-called “subsidiary waiver”) pursuant to which they may waive certain regulatory requirements to the same extent as Deutsche Bank AG (see preceding paragraph) on a stand-alone basis. In addition, Deutsche Bank AG’s subsidiaries Deutsche Immobilien Leasing GmbH and Leasing Verwaltungsgesellschaft Waltersdorf mbH, also consolidated within the Deutsche Bank regulatory group, applied the “subsidiary waiver” rules to the extent applicable to them, i.e. with regard to certain risk management requirements pursuant to Section 25a (1) sentence 3 KWG.

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

The application of the aforementioned exemptions and the fulfillment of the respective requirements were notified to the BaFin and Deutsche Bundesbank on the basis of Section 2a (1) or (6) KWG in its version applicable until December 31, 2013. Pursuant to Section 2a (5) KWG the exemptions based on these notifications are grandfathered, i.e. the “waivers” are deemed to be granted under the current CRR and KWG rules.

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.

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: eight, mostly immaterial subsidiaries which were not consolidated for accounting purposes were consolidated within the regulatory group; a further four entities are jointly managed by us and other owners and were consolidated on a pro-rata basis within the regulatory group while for financial accounting purposes two of them were accounted according to the equity method, one was consolidated according to the SPE-rules and one entity was treated as an available-for-sale-asset.

As of year-end 2016, our regulatory group comprised 580 entities (excluding the parent Deutsche Bank AG), of which four were consolidated on a pro-rata basis. The regulatory group comprised 95 credit institutions, one payment institution, 56 financial services institutions, 287 financial enterprises, seven asset management companies and 134 ancillary services undertakings.

As of year-end 2015, our regulatory group comprised 677 entities (excluding the parent Deutsche Bank AG), of which five were consolidated on a pro-rata basis. The regulatory group comprised 122 credit institutions, two payment institutions, 58 financial services institutions, 334 financial enterprises, eight asset management companies and 153 ancillary services undertakings.

85 entities were exempted from regulatory consolidation pursuant to Section 31 (3) KWG in conjunction with Article 19 CRR as per year end 2016 (year end 2015: 102 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. None of these entities needed 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 € 12 million as per year end 2016 (year end 2015: € 14 million). We further have applied the deduction treatment to 220 regulatory unconsolidated entities in the financial sector (including four insurance entities) where we have an investment of more than 10 % of the capital of these entities as per year end 2016 (year end 2015: 233 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. Although we are classified as a financial conglomerate, two of the four insurance entities that were included in the deduction treatment belong to the financial conglomerate. For formal reasons we could not continue to hold the permission to not apply this treatment as a continuation of previous section 10 (6) sentence 7 KWG. The ECB however granted an exception from the deduction treatment for our largest insurance company Abbey Life Assurance Company for which instead we applied a risk weight of 370 %. With effect from December 30, 2016 Abbey Life Assurance Company Limited has been sold.

Financial Conglomerate

Deutsche Bank Group was designated as a financial conglomerate by the BaFin in November 2007. Therefore, the German Act on the Supervision of Financial Conglomerates (Finanzkonglomerate-Aufsichtsgesetz or FKAG) in conjunction with the Financial Conglomerates Solvency Regulation (FkSolV) is applicable to us.

The financial conglomerate of Deutsche Bank consists predominantly of entities that belong to the regulatory group and a small number of individual insurance sector entities. At the beginning of 2016 the material insurance sector entities were:

- Abbey Life Assurance Company Limited
- DB Re S.A.
- DB Vita S.A.
- Legacy Reinsurance, LLC
- Primelux Insurance S.A.

With the exception of Abbey Life all of these insurances (and additionally three immaterial insurance companies) were subject to the applicable threshold capital deduction rules for investments in financial sector entities, as for formal reasons Deutsche Bank could not continue to hold the permission to not apply this treatment as a continuation of previous section 10 (6) sentence 7 KWG. The ECB granted an exception for Abbey Life to risk weight this investment which we applied at a level of 370 %.

The material insurance entities were included in the additional capital adequacy calculation (also referred to as “solvency margin”) for the financial conglomerate. The insurance sector subsidiaries (including Abbey Life) of Deutsche Bank in aggregate made up only about 1 % of the entire Deutsche Bank Group IFRS balances.

Legally all these insurance companies were not directly associated; i.e. none of these insurance companies held a participation in another insurance company, so that technically these insurance companies did not form a group on their own.

From the overall governance perspective these insurance companies are integrated, in principle, into Deutsche Bank Group no differently from any other legal entity of Deutsche Bank Group. This is, among others, evidenced by the fact that Deutsche Bank issues its group policies to any subsidiary, regardless of whether such subsidiary forms part of the prudentially consolidated group (according to Article 18 CRR) or not. The applicability of relevant group policies, in turn, ensures that insurance sector subsidiaries maintain effectively the same governance and management structures as the rest of the regulatory group. For further details with regard to the organizational requirements in accordance with Section 25 (4) FKAG please refer to our Corporate Governance Report and the sections “Risk and Capital Framework” and “Risk and Capital Management” within our Risk Report.

During the year 2016 the composition of the insurance sector within the financial conglomerate changed. In the second quarter Primelux Insurance S.A. was merged into DB Re S.A and one of the immaterial insurances was closed. In the fourth quarter also Legacy Reinsurance LLC was closed. Additionally, with effect from December 30, 2016 the most material insurance entity Abbey Life Assurance Company Limited has been sold. Given that our remaining insurance sector entities are not significant, we have initiated a re-assessment of Deutsche Bank’s financial conglomerate status.

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, 2016:

- 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 four subsidiaries as “significant” for the Group and hence required to provide additional disclosure requirements as laid down in Article 13 CRR:

- Deutsche Postbank AG, Germany
- Deutsche Bank Luxembourg S.A., Luxembourg
- DB USA Corporation, United States of America
- Deutsche Securities Inc., Japan
- 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 Deutsche Securities Inc., Japan and DB USA Corporation.

General Risk Management Framework and Governance

Risk Management Principles and Governance

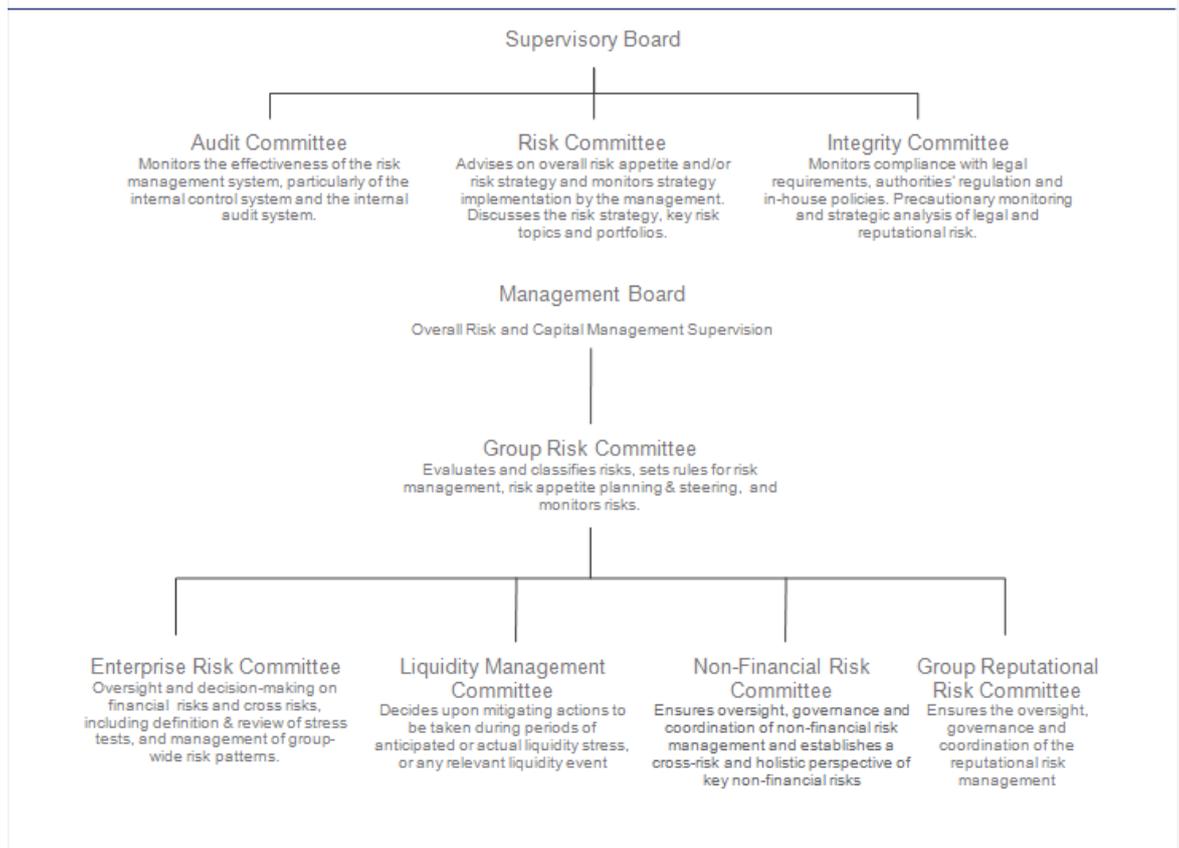
The diversity of our business model requires us to identify, assess, measure, aggregate and manage our risks, and to allocate our capital among our businesses. Risk and capital are managed via a framework of principles, organizational structures and measurement and monitoring processes that are closely aligned with the activities of the divisions and business units:

- Core risk management responsibilities are embedded in the Management Board and delegated to senior risk managers and senior risk management committees responsible for execution and oversight.
- We operate a Three Lines of Defense (“3LoD”) risk management model. The 1st Line of Defense (“1st LoD”) are all the business divisions and service providing infrastructure areas (Group Technology Operations and Corporate Services) who are the “owners” of the risks. The 2nd Line of Defense (“2nd LoD”) are all the independent risk and control infrastructure functions. The 3rd Line of Defense (“3rd LoD”) is Group Audit, which assures the effectiveness of our controls. The 3LoD model and the underlying design principles apply to all levels of the organization i.e. Group-level, regions, countries, branches and legal entities. All 3LoD are independent of one another and accountable for maintaining structures that ensure adherence to the design principles at all levels.
- The risk strategy is approved by the Management Board on an annual basis and is defined based on the Group Risk Appetite and the Strategic and Capital Plan in order to align risk, capital and performance targets.
- Cross-risk analysis reviews are conducted across the Group to validate that sound risk management practices and a holistic awareness of risk exist.
- All material risk types, including credit risk, market risk, operational risk, liquidity risk, business risk and reputational risk are managed via risk management processes. Modeling and measurement approaches for quantifying risk and capital demand are implemented across the material risk types. Reputational risk is implicitly covered in our economic capital framework, primarily within operational and strategic risk. For more details, refer to section “Risk and Capital Management” in the Annual report for the management process of our material risks.
- Monitoring, stress testing tools and escalation processes are in place for key capital and liquidity thresholds and metrics.
- Systems, processes and policies are essential components of our risk management capability.
- Recovery planning provides the escalation path for crisis management governance and supplies senior management with a set of actions designed to improve the capital and liquidity positions in a stress event.
- Resolution planning is the responsibility of our resolution authority, the Single Resolution Board. It provides a strategy to manage Deutsche Bank in case of default. It is designed to prevent major disruptions to the financial system or the wider economy through maintaining critical services.

Risk Governance

- Our operations throughout the world are regulated and supervised by relevant authorities in each of the jurisdictions in which we conduct business. Such regulation focuses on licensing, capital adequacy, liquidity, risk concentration, conduct of business as well as organizational and reporting requirements. The European Central Bank (the “ECB”) in connection with the competent authorities of EU countries which joined the Single Supervisory Mechanism via the Joint Supervisory Team act in cooperation as our primary supervisors to monitor our compliance with the German Banking Act and other applicable laws and regulations as well as the CRR/CRD 4 framework and respective implementations into German law.
- European banking regulators assess our capacity to assume risk in several ways, which are described in more detail in the section “Regulatory Capital” of this report.
- Several layers of management provide cohesive risk governance:
 - The Supervisory Board is informed regularly on our risk situation, risk management and risk controlling, as well as on our reputation and material litigation cases. It has formed various committees to handle specific tasks.
 - At the meetings of the Risk Committee, the Management Board reports on key risk portfolios, on risk strategy and on matters of special importance due to the risks they entail. It also reports on loans requiring a Supervisory Board resolution pursuant to law or the Articles of Association. The Risk Committee deliberates with the Management Board on issues of the aggregate risk position and the risk strategy and supports the Supervisory Board in monitoring the implementation of this strategy.
 - The Integrity Committee, among other matters, monitors the Management Board’s measures that promote the company’s compliance with legal requirements, authorities’ regulations and the company’s own in-house policies. It also reviews the Bank’s Code of Business Conduct and Ethics, and, upon request, supports the Risk Committee in monitoring and analyzing the Bank’s legal and reputational risks.
 - The Audit Committee, among other matters, monitors the effectiveness of the risk management system, particularly the internal control system and the internal audit system.
 - The Management Board is responsible for managing Deutsche Bank Group in accordance with the law, the Articles of Association and its Terms of Reference with the objective of creating sustainable value in the interest of the company, thus taking into consideration the interests of the shareholders, employees and other stakeholders. The Management Board is responsible for establishing a proper business organization, encompassing appropriate and effective risk management. The Management Board established the Group Risk Committee (“GRC”) in April, 2016 as the central forum for review and decision on material risk topics, by merging the Capital and Risk Committee (“CaR”) and the Risk Executive Committee (“Risk ExCo”). The GRC is supported by four sub-committees; Group Reputational Risk Committee (“GRRC”), Non-Financial Risk Committee (“NFRC”), Enterprise Risk Committee (“ERC”), and Liquidity Management Committee (“LMC”), the roles of which are described in more detail below.

Risk Management Governance Structure of the Deutsche Bank Group



The following functional committees are central to the management of risk at Deutsche Bank:

- The GRC has various duties and dedicated authority, including approval of key risk management principles or recommendation thereof to the Management Board for approval, recommendation of the Group Recovery Plan and the Contingency Funding Plan to the Management Board for approval, recommendation of overarching risk appetite parameters and recovery triggers to the Management Board for approval, setting of risk limits for risk resources available to the Business Divisions, and supporting the Management Board during group-wide Risk and Capital planning processes. Further duties include review of high-level risk portfolios and risk exposure developments, review of internal and regulatory group-wide stress testing results and making recommendations of required actions and monitoring of the development of risk culture across the Group.
- The NFRC oversees, governs and coordinates the management of non-financial risks in Deutsche Bank Group and establishes a cross-risk and holistic perspective of the key non-financial risks of the Group. It is tasked to define the non-financial risk appetite framework, to monitor and control the non-financial risk operating model, including the 3LoD principles and interdependencies between business divisions and control functions and within control functions.
- The GRRC is responsible for the oversight, governance and coordination of reputational risk management and provides for an appropriate look-back and a lessons learnt process. It reviews and decides all reputational risk issues escalated by the Regional Reputational Risk Committees ("RRRCs") and RRRC decisions which have been appealed by the Business Units. It provides guidance on Group-wide reputational risk matters, including communication of sensitive topics, to the appropriate levels of Deutsche Bank Group. The RRRCs which are sub-committees of the GRRC are responsible for the oversight, governance and coordination of the management of reputational risk in the respective regions on behalf of the Management Board.

- The ERC has been established as a successor of the Portfolio Risk Committee (“PRC”) with a mandate to focus on enterprise-wide risk trends, events and cross-risk portfolios, bringing together risk experts from various risk disciplines. The ERC approves the annual country risk portfolio overviews, establishes product limits, reviews risk portfolio concentrations across the Group, monitors group-wide stress tests used for managing the Group’s risk appetite, and reviews topics with enterprise-wide risk implications like risk culture.
- The LMC decides upon mitigation actions to be taken during periods of anticipated or actual liquidity stress or any relevant event. In that capacity, the committee is responsible for making a detailed assessment of the liquidity position of the Bank, including the ability to fulfill all payment obligations under market related stress, idiosyncratic stress, or a combination of both. The LMC is also responsible for overseeing the execution of liquidity countermeasures in a timely manner and monitoring the liquidity position of the bank on an ongoing basis, during the stress period.

Our Chief Risk Officer (“CRO”), who is a member of the Management Board, has Group-wide, supra-divisional responsibility for the management of all credit, market and operational risks as well as for the comprehensive control of risk, i.e. including liquidity risk, and continuing development of methods for risk measurement. In addition, the CRO is responsible for monitoring, analyzing and reporting risk on a comprehensive basis.

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.

Management of Material Risks

The management of credit, market, operational, liquidity, business (strategic) and reputational risks is narrated in the Annual Report under chapter “Risk and Capital Management”. Please refer to the chapter for more details. For our securitization business, the framework is narrated in section “Securitization” below, measurement approach in section “Risk Quantification and Measurement – Securitization Measurement” and section “Securitization Details” for the exposure figures.

Securitization

Overview of our Securitization Activities

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 “Allocation of Positions to the Regulatory Trading book”.

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 the banking book positions, we act as originator, sponsor and investor. As an originator we use securitizations primarily as a strategy to reduce credit risk, mainly through the Credit Portfolio Strategies Group (“CPSG”). CPSG uses, among other means, synthetic securitizations to manage the credit risk of loans and lending-related commitments of the Institutional Corporate Credit portfolio (primarily unsecured, investment grade corporates), Leveraged Debt Capital Markets portfolio (primarily secured, non-investment grade corporates), and the German and Dutch MidCap portfolio within the corporate divisions of CIB. In addition CIB, through the Global Transaction Banking division, manages their trade finance exposures separately through synthetic securitizations. For all of the above portfolios, the credit risk is predominantly transferred to counterparties through synthetic securitizations mainly through the issuance of Credit Linked Notes providing first loss protection.

On a limited basis we have entered into securitization transactions as part of an active liquidity risk management strategy during 2008 and 2009, some of which we replaced in 2015 with a new securitization transaction. 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, equity and credit derivatives.

Overall, the securitization positions are exposed to the performance of diverse asset classes, including primarily corporate senior secured loans or unsecured debt, consumer debt such as auto loans or student loans, as well as residential or commercial first and second lien mortgages. We are active across the entire capital structure with an emphasis on the more senior tranches. The subset of re-securitization is predominantly backed by securitizations with corporate obligations in the underlying pools.

In the trading book, we act as originator, sponsor and investor. In the role of investor, our main objective is to serve as a market maker in the secondary market. The market making function consists of providing liquidity for our customers and providing two way markets (buy and sell) to generate flow trading revenues. In the role of originator, we finance loans to be securitized, predominantly in the commercial real estate business. Trading book activities where we have the role of a sponsor (excluding activities derived from multi-seller originator transactions) as described above are minimal.

We hold a portfolio of asset backed securities (“ABS”) correlation trades within the NCOU portfolio that is in the process of being wound down. Other than facilitating the de-risking, no new activity is being generated. Our securitization desks trade assets across all capital structures, from senior bonds with large subordination to first loss subordinate tranches, across both securitizations and re-securitizations. Securitization positions consist mostly of residential mortgage backed securities (“RMBS”) and commercial mortgage backed securities (“CMBS”) backed by first and second lien loans, collateralized loan obligations (“CLOs”) backed by corporate senior loans and unsecured debt and consumer ABS backed by secured and unsecured credit.

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.

Accounting and Measurement Policies for Securitizations

Our accounting policies are included in Note 1 "Significant Accounting Policies and Critical Accounting Estimates". 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", "Financial Assets and Financial Liabilities" and "Derecognition of Financial Assets and Financial Liabilities", see also Note 14 "Financial Instruments carried at Fair Value". All the above references are found in our Financial Report. For measurement and quantification of both our banking and trading book securitizations, please refer to section "Risk Quantification and Measurement" of this report.

Securitization Management

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 longer-term 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.

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 with a new securitization transaction. 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.

We have identified part of the existing book of securitization transactions as “legacy book” earmarked for de-risking, which forms part of our NCOU. De-risking generally means that existing positions on our books are either partially or completely sold into the market, as far as adequate prices can be achieved. These positions also benefit from reduction through amortization, where applicable. Credit hedging requirements for securitization exposures are mandated in the context of each individual credit approval, and are re-visited at each internal credit or rating review. However, management of credit risk is conducted mostly 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. 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 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 financials. Such indirect counterparty risk is reported to the hedging counterparty’s credit officer to become part of his/her credit evaluation. Please refer to section “Credit Risk Management” in our Financial Report for detailed information on the credit risk management framework.

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 limits. 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 limit. The limit monitoring system captures exposures and flags any threshold breaches. Market Risk Management approval is required for any trades over the limit.

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 limits 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 limits. When the limit monitoring system captures positions that exceed their respective market value limits 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.

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.

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" in our Financial Report for detailed information on the market risk management framework.

Risk Quantification and Measurement

In this chapter, we outline the quantification approaches we use to measure our risk weighted assets to determine regulatory capital and internal economic capital demand as part of the overall risk management process. First, we focus on the quantification of the risk weighted assets for credit risk (including the measurement of counterparty credit risk and securitizations), market risk and operational risk. Second, we narrate the internal economic capital model for risk types; credit risk, market risk, operational risk, and business risk. The economic capital for reputational, model, and compliance risks is covered partially under operational risk and business risk. Lastly, we elaborate on the quantification approaches used in our group wide stress testing.

Regulatory Capital Model

We measure our credit risk, market risk and operational risk to determine risk weighted assets for regulatory capital requirement purposes in line with CRR/CRD 4 as elaborated in the respective sections below.

Credit Risk Measurement

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 62 internally developed rating systems for regulatory capital calculation purposes excluding for exposures in Postbank. Thereof, 37 rating systems were authorized in December 2007. Overall they cover all of our material exposures in the advanced IRBA eligible exposure classes “central governments and central banks”, “institutions”, “corporates”, and “retail”.

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

Our exposures reported under foundation IRBA include parts of Postbank’s corporate portfolios and our Project Finance (Specialized Lending) exposures 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. With regard to these, an implementation plan and approval schedule have been set up and agreed with the Bundesbank, the BaFin and the ECB. A portion of Postbank’s IRBA eligible portfolios is also still temporarily assigned to the standardized approach. Implementation plans for the Group excluding Postbank and for Postbank have been agreed with the BaFin, Bundesbank and the ECB. During 2016, the Integrated Roadmap with an overall Group Level implementation plan remained on hold as a consequence of the Strategy 2020/Postbank deconsolidation.

Details of the standardized approach and the standardized approach exposures are discussed in the Section “Standardized Approach”.

Our advanced IRBA coverage ratio, excluding Postbank, exceeded, with 97,3 % by exposure value (“EAD”) as well as with 93,4 % by RWA as of December 31, 2016, the European regulatory requirement, remaining nearly unchanged from the levels at December 31, 2015 (97,0 % EAD and 92,8 % by RWA), using applicable measures according to Section 11 SolvV. These ratios excluded the exposures permanently assigned to the standardized approach (according to Article 150 CRR), other IRBA exposure as well as securitization positions. The regulatory minimum requirements with regard to the respective coverage ratio thresholds have been met at all times.

Credit Risk: Regulatory Assessment

Advanced Internal Ratings Based Approach

The advanced IRBA is the most sophisticated approach available under the regulatory framework for credit risk and allows us to make use of our internal rating methodologies as well as internal estimates of specific other risk parameters. These methods and parameters represent long-used key components of the internal risk measurement and management process supporting the credit approval process, the economic capital and expected loss calculation and the internal monitoring and reporting of credit risk. The relevant parameters include the probability of default ("PD"), the loss given default ("LGD") and the maturity ("M") driving the regulatory risk-weight and the credit conversion factor ("CCF") as part of the regulatory exposure at default ("EAD") estimation. For most of our internal rating systems more than seven years of historical information is available to assess these parameters. Our internal rating methodologies aim at point-in-time rather than a through-the-cycle rating.

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

A prerequisite for the development of rating methodologies and the determination of risk parameters is a proper definition, identification and recording of the default event of a customer. We apply a default definition in accordance with the requirements of Article 178 CRR as confirmed by the BaFin and ECB as part of the IRBA approval process.

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.

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 Postbank, 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.

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.

Assignment to Regulatory Exposure Classes

The advanced 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.

We use the simple risk-weight approach according to Article 155 (2) CRR for our investments in equity positions entered into since January 1, 2008. It distinguishes between exposure in equities which are non-exchange traded but sufficiently diversified, exchange-traded and other non-exchange-traded and then uses the regulatory-defined risk weights of 190 %, 290 % or 370 %, respectively. We also include exposures attracting a risk weight of 250 % according to Article 48 (4) for significant investments in the CET 1 instruments of financial sector entities which are subject to the threshold exemptions as outlined in Article 48 CRR.

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

Credit Risk Advanced IRBA – Model Validation

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

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

Analogously at Postbank the results of the estimations of the input parameters PD, CCF and LGD are reviewed annually. Postbank’s model validation committee is responsible for supervising the annual validation process of all models. Via a cross committee membership Deutsche Bank senior managers join Postbank committees and vice versa, to promote joint governance.

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.

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 predefined by the regulator, or 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.

For certain CIU exposures we apply the “look-through”-treatment which constitutes a decomposition of the CIU into its underlying investments. According to Article 152 CRR these exposures, primarily consisting of defined benefit pension fund assets, are assigned to the standardized approach.

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.

Equity positions entered into before January 1, 2008 are subject to the transitional arrangement to exempt them from the IRBA and a risk weight of 100 % is applied according to the standardized approach treatment.

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. DBRS ratings are applied in the standardized approach for a small number of exposures since 2009. 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. Moreover, 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.

Regulatory Application of Credit Risk Mitigation Techniques

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.

Counterparty Credit Risk

Counterparty credit exposure ("CCR") arises from our direct trading activity in derivatives and securities financing transactions ("SFT"), it is calculated in both the trading and non-trading books and is the risk that the counterparty to a transaction may default before completing the satisfactory settlement of the transaction.

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 separate limits. 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).

In compliance with Article 291(2) and (4) CRR, we established a monthly process to monitor several layers of wrong-way risk (specific wrong-way risk, general explicit wrong-way risk at country/industry/region levels and general implicit wrong-way risk), whereby exposures arising from transactions subject to wrong-way risk are automatically selected and presented for comment to the responsible credit officer. A wrong-way risk report is then sent to Credit Risk senior management on a monthly basis. Postbank derivative counterparty risk is immaterial to the Group and collateral held is typically in the form of cash.

Measurement of Counterparty Credit Risk

For the majority of derivative counterparty exposures as well as securities financing transactions (“SFT”), we (without Postbank) make use of the internal model method (“IMM”) in accordance with Article 283 et seq. CRR. In this respect securities financing transactions 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”) and expected positive exposure (“EPE”)

Under IMM approach EAD is then finally calculated as the product of EPE and a multiplier ‘Alpha’ (α). The scaling factor alpha is applied in order to correct for amongst others correlations between parties, concentration risk and to account for the level of volatility/correlation that might coincide with a downturn. Deutsche Bank received regulatory approval to use our own calibrated alpha factor, floored at the regulatory minimum level of 1.2. 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.

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 a PFE limit profile set by the responsible 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 customer level calculation of the IRBA regulatory capital under the so-called internal model method (“IMM”), whereas AEE feeds as a loan equivalent into the Group’s credit portfolio model where it is combined with all other exposure to a counterparty within the respective simulation and allocation process.

For our derivative counterparty credit risk resulting from Postbank 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 Postbank is less than 2 % in relation to our overall counterparty credit risk position from derivatives we consider Postbank’s derivative position to be immaterial.

For further details on our counterparty credit risk, please refer to the Financial Report 2016 under sections: “Netting and Collateral Arrangements for Derivatives and Securities Financing Transactions”, “Derivatives-CVA, Treatment of Default Situations under Derivatives”, “Credit Exposure from Derivatives”. Additional counterparty credit risk exposure figures are also found in this report under “Positive market values or replacement costs of trading derivative transactions” and “Nominal volumes of credit derivative exposure”.

Securitization Measurement

Calculation of Regulatory Capital Requirements for Banking Book Securitizations

The regulatory capital requirements for the credit risk of banking book securitizations are determined based on the securitization framework pursuant to Articles 242 to 270 CRR, which distinguishes between credit risk standardized approach (“CRSA”)-securitization positions and internal ratings based approach (“IRBA”)-securitization positions. The classification of securitization positions as either CRSA- or IRBA-securitization positions depends on the nature of the securitized portfolio. Basically, CRSA-securitization positions are those where the securitized portfolio predominantly includes credit risk exposures, which would qualify as CRSA-exposures under the credit risk framework if they would be held by us directly. Otherwise, if the majority of the securitized portfolio would qualify as IRBA-exposures, the securitization positions qualify as IRBA-securitization positions.

The risk weights of CRSA-securitization positions are derived from their relevant external ratings, when applicable. External ratings must satisfy certain eligibility criteria for being used in the risk weight calculation. Eligible external ratings are taken from Standard & Poor’s, Moody’s, Fitch Ratings, DBRS and Kroll. If more than one eligible rating is available for a specific securitization position, the relevant external rating is determined as the second best eligible rating in accordance with the provisions set forth in Article 269 CRR.

CRSA-securitization positions with no eligible external rating receive a risk weight of 1,250 % unless they qualify for the application of:

- the Internal Assessment Approach according to Article 109 (1) CRR in conjunction with Article 259 (3) and (4) CRR. The Internal Assessment Approach applies to unrated IRBA-securitization positions related to ABCP programs. As we discontinued the use of ABCP programs in 2015, there are no securitizations positions subject to the Internal Assessment Approach as of December 31, 2016.
- the risk concentration approach pursuant to Article 253 CRR which might lead to a risk weight below 1,250 %. The risk concentration approach is applied to a few CRSA-securitization exposures that are small compared with the total amount of our banking book securitization exposures.

The risk weight of IRBA-securitization positions is determined according to the following hierarchy:

- If one or more eligible external ratings exist for the IRBA-securitization position, or if an external rating can be inferred from an eligible external rating of a benchmark securitization position, the risk weight is derived from the relevant external rating (ratings based approach).
- Otherwise, if no eligible external rating exists or can be inferred, the risk weight of the IRBA-securitization position will generally be determined based on the supervisory formula approach pursuant to Section 262 CRR or the internal assessment approach pursuant to Article 259 (3) and (4) CRR.
- If neither of the aforementioned approaches can be applied, the position receives a risk weight of 1,250 %.

The ratings based approach applies to approximately 10 % of our IRBA- and CRSA-securitization exposure, largely in the lower (better) risk weight bands. The majority of securitization positions with an eligible external or inferred external credit assessment are securitization positions held as investor.

Approximately 88 % of the total banking book securitization exposure is subject to the supervisory formula approach (“SFA”). This approach is predominantly used to rate positions backed by corporate loans, auto-related receivables and commercial real estate loans. The risk weight of securitization positions subject to the SFA is determined based on a formula which takes as input the capital requirement of the securitized portfolio and the seniority of the securitization position in the waterfall, amongst others. When applying the SFA, we estimate the risk parameters PD and LGD for the assets included in the securitized portfolio, by using internally developed rating systems approved for such assets. We continue to develop new rating systems for homogenous pools of assets to be applied to assets that have not been originated by us. The rating systems are based on historical default and loss information from comparable assets. The risk parameters PD and LGD are derived on risk pool level.

There is no securitization position for which we have applied the special provisions for originators of securitization transactions which include an investor's interest to be recognized by the originator pursuant to Article 256 CRR respectively Article 265 CRR.

Calculation of Regulatory Capital Requirements for Trading Book Securitizations

The regulatory capital requirements for the market risk of trading book securitizations are determined based on a combination of internal models and regulatory standard approaches pursuant to Article 337 CRR.

The capital requirement for the general market risk of trading book securitization positions is determined as the sum of (i) the value-at-risk based capital requirement for market risk and (ii) the stressed value-at-risk based capital requirement for market risk.

The capital requirement for the specific market risk of trading book securitization positions depends on whether the positions are assigned to the regulatory correlation trading portfolio ("CTP") or not.

For securitization positions that are not assigned to the CTP, the capital requirement for specific market risk is calculated based on the market risk standardized approach ("MRSA"). The MRSA risk weight for trading book securitization positions is generally calculated by using the same methodologies which apply to banking book securitization positions. The only difference relates to the use of the SFA for a small portion of trading book securitization positions, where the capital requirement of the securitized portfolio is determined by making use of risk parameters (probability of default and loss given default) that are based on the incremental risk charge model. The MRSA based capital requirement for specific risk is determined as the sum of the capital requirements for all net long and all net short securitization positions outside of the CTP. The securitization positions included in the MRSA calculations for specific risk are additionally included in the value-at-risk and stressed value-at-risk calculations for specific risk.

Trading book securitizations subject to MRSA treatment include various asset classes differentiated by the respective underlying collateral types:

- Residential mortgage backed securities ("RMBS");
- Commercial mortgage backed securities ("CMBS");
- Collateralized loan obligations ("CLO");
- Collateralized debt obligations ("CDO"); and
- Asset backed securities (incl. credit cards, auto loans and leases, student loans, equipment loans and leases, dealer floorplan loans, etc).

They also include synthetic credit derivatives and commonly-traded indices based on the above listed instruments.

Conversely, the capital requirement for the specific market risk of securitization positions which are assigned to the CTP is determined as the sum of (i) the value-at-risk based capital requirement for specific risk, (ii) the stressed value-at-risk based capital requirement for specific risk and (iii) the capital requirement for specific risk as derived from the comprehensive risk measurement ("CRM") model. The CRM based capital requirement is subject to a floor equal to 8 % of the higher of the specific risk capital requirements for all net long and all net short CTP positions under the MRSA.

The CTP includes securitization positions and nth-to-default credit derivatives principally held for the purpose of trading correlation that satisfy the following requirements:

- all reference instruments are either single-name instruments, including single-name credit derivatives for which a liquid two-way market exists, or commonly-traded indices based on those reference entities;
 - the positions are neither re-securitization positions, nor options on a securitization tranche, nor any other derivatives of securitization exposures that do not provide a pro-rata share in the proceeds of a securitization tranche; and
 - the positions do not reference a claim on a special purpose entity, claims or contingent claims on real estate property or retail.
- The CTP also comprises hedges to the securitization and nth-to-default positions in the portfolio, provided a liquid two-way market exists for the instrument or its underlying. Typical products assigned to the CTP are synthetic CDOs, nth-to-default credit default swaps (“CDS”), and index and single name CDS.

Please refer to section “Market Risk Measurement” for general information on our market risk quantification approaches.

Market Risk Measurement

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

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

Internally developed market risk models

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

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 will not be exceeded in a defined period of time and with a defined confidence level.

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 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 capital requirements and risk-weighted assets, the holding period is ten days.

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

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

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

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

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

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

- The use of historical market data may not be a good indicator of potential future events, particularly those that are extreme in nature. This “backward-looking” limitation can cause VaR to understate risk (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 book that are partially or not captured by the VaR model.

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

During 2016 the value-at-risk calculation was further refined. In particular, the implementation was finalised of the equity skew risk for Equity Derivatives, initiated in 2015. The distribution modeling of credit spread and interest rate risk factors was also reviewed and enhanced to adequately capture current market conditions.

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.

Incremental Risk Charge

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 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.

The revaluation approach was further improved in 2016 by employing refined valuation methodologies for a large set of products, in particular covering trades with non-linear features.

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

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

Comprehensive Risk Measure

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

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

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

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

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

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

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

For regulatory reporting purposes, the comprehensive risk measure represents the higher of the internal model spot value at the reporting dates, their preceding 12-week average calculation, and the floor, where the floor is equal to 8 % of the equivalent capital charge under the standardized approach securitization framework. Since the first quarter of 2016, the CRM RWA calculations include two regulatory-prescribed add-ons which cater for: (a) stressing the implied correlation within nth-to-default baskets and (b) any stress test loss in excess of the internal model spot value.

We have received approval for the use in the calculation of regulatory capital, of all internally-developed models described above; VaR, SvaR (including CVA VaR and SvaR), Incremental Risk Charge and Comprehensive Risk Measure.

Market Risk Standardized Approach

Market Risk Management monitors exposures and addresses risk issues and concentrations for certain exposures under the specific Market Risk Standardized Approach ("MRSA"). We use the MRSA to determine the regulatory capital charge for the specific market risk of trading book securitizations (see section Securitization Measurement - Calculation of Regulatory Capital Requirements for Trading Book Securitizations).

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

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

Validation of internally developed market risk models

Regulatory Backtesting of Trading Market Risk

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

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

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

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

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

Holistic Validation process

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

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

At year end 2016, our value-at-risk and stressed value-at-risk multiplier was at 4.0 versus the regulatory floor of three.

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.

Portfolio Stress Testing measures the profit and loss impact of potential market events based on a broad range of historical or hypothetical macroeconomic 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.

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. The economic capital is set at a level to absorb at a 99.98 % percentile very severe aggregate unexpected losses within one year. 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.

Drivers for Operational Risk Capital

In 2016, our operational risk losses have been predominantly driven by losses and provisions arising from civil litigation and regulatory enforcement. Such losses account for more than 90 % of operational risk losses and account for the majority of operational risk regulatory and economic capital demand.

Our Operational Risk Management fosters a forward-looking risk management with regard to monitoring of potential profits and losses, focusing on regular review of civil litigations and regulatory enforcement matters, trend analysis based upon available losses and key risk indicator data.

This is particularly reflected in 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 within a one year time horizon 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 that is not 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 our financial statements and in the accompanying Note 30 “Provisions”.
- Uncertain legal losses which are not reflected in our financial statements as provisions as they do not meet the recognition criteria under IAS 37 are expressed as “regulatory or economic capital demand” reflecting our legal risk exposure which consumes regulatory and economic capital.

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

We include the legal forecasts in the “Relevant Loss Data” used in our AMA model. Hereby the projection range of the legal forecasts is not restricted to the one year capital time horizon but goes beyond and conservatively assumes early settlement of the underlying losses in the reporting period - thus considering the multi-year nature of legal matters. This reflection of legal forecasts within the AMA model has been in place since 2014 as part of a proactive implementation of a model change request that was approved by our European supervisory authority, the ECB, in August 2016.

Our AMA Model Validation and Quality Assurance Review Concept

We independently validate all our AMA model components including but not limited to scenarios, Key Risk Indicators and Self-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 estimation of the loss frequency and the use of legal forecasts; these are now included in our AMA model. Quality Assurance Reviews 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 any capital calculation.

Our Operational Risk Management Stress Testing Concept

We conduct stress testing on a regular basis to complement our AMA methodology, to analyze the impact of extreme macro scenarios on our capital and the profit-and-loss account. It also contains reputational impacts. In 2016, Operational Risk Management took part in all firm-wide stress test scenarios and assessed and contributed the impact of operational risk to the various stress levels of the scenarios. The impact of operational risk on macro stress test scenarios has been moderate and remained in the expected range in regards to capital, which is due to the fact that our AMA model already applies a conservative multi-year view on loss sizes (including legal forecasts) even in non-stress mode.

Internal Capital Model

Besides the regulatory risk types listed in the above sections, we identify measure and monitor a comprehensive variety of risks that come as a result of our business activities. We calculate Pillar II capital demand using Economic Capital (EC) on a Gone Concern methodology based on an internal estimate of capital requirements based on our risk profile. EC calculation was first introduced in 1996 and has been continuously enhanced since then. We measure our internal capital demand by applying a substantially more conservative 99.98 % quantile in comparison to the regulatory calibration which is based on 99.90 %.

The following sections therefore describe the quantitative and qualitative measurement of risk, which eventually results in an economic capital value. A comprehensive overview of risk types is provided describing which risk types are explicitly quantified in the economic capital model (credit, market, operational, and business risk including concentration risk and diversification effects), which are implicitly or otherwise quantitatively considered (e.g. reputational risk and model risk), and which are not quantified in economic capital (liquidity risk).

Economic Capital risk matrix

Risk type	Covered in EC Model				Coverage in EC model	✓ Covered (✓) Partly covered
	CR	MR	OR	BR		
Credit Risk	✓				<ul style="list-style-type: none"> Covers counterparty (default) risk, transfer risk, and settlement risk. 	
Market Risk		✓			<ul style="list-style-type: none"> Covers traded market risk, non-traded market risk and traded default risk. 	
Operational Risk			✓		<ul style="list-style-type: none"> Covers risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. AMA model uses internal and external loss data. OR EC partly covers model, reputational and compliance risks. 	
Business Risk				✓	<ul style="list-style-type: none"> Includes strategic and tax risks, each covered with separate model. Strategic risk covers the risk of negative earnings downside due to revenues and/or costs underperforming targets. EC partly covers model, reputational and compliance risks. 	
Reputational Risk			(✓)	(✓)	<ul style="list-style-type: none"> Implicitly covered in operational and business risk EC. 	
Risk concentrations	✓	✓	✓	✓	<ul style="list-style-type: none"> Covered in all portfolio models used (e.g. via multi-factor model). 	
Liquidity Risk					<ul style="list-style-type: none"> No EC determined, since capital reserves (often invested in medium- to long-term) are not appropriate to mitigate short-term liquidity bottlenecks. A dedicated liquidity risk management aims to mitigate and govern this risk. 	

We calculate EC for four risk modules – credit risk, market risk, operational risk and business risk. The EC model and the underlying methodologies used for these four risk modules are described in this section. Most of the risk types mentioned in the list above are taken into account within these four risk modules and therefore in the EC model, e.g., strategic risk (see the mappings in the above figure). The exceptions not completely covered in the economic capital model are liquidity, model risk and reputational risks. Reputational and model risks are partly covered in strategic risk (and therefore business risk in the EC model) and operational risk. We do not determine EC for liquidity risk, since capital is not appropriate to mitigate liquidity risk. Other more appropriate risk metrics are used to measure and manage these risks instead.

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 99.98 % 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. The current standard in credit portfolio modeling is to define the risk capital in terms of a percentile of the portfolio loss distribution, i.e., value-at-risk (VaR) of the loss of the portfolio at a specified confidence level α . VaR has an intuitive economic interpretation, i.e., it specifies the capital needed to absorb losses with probability α and has even achieved the high status of being written into industry regulations.

The concept of a coherent risk measure provides a useful characterization of risk measures under fairly general conditions. The most prominent class of coherent risk measures is expected shortfall, which can be interpreted as the average of all losses above a given percentile of the loss distribution. An important advantage of expected shortfall is the simple allocation of risk capital to subportfolios or individual transactions: the expected shortfall contribution of a subportfolio is its average contribution to portfolio losses above the percentile.

Economic capital is derived from VaR with confidence level $\alpha = 99.98\%$. 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.

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 systemic country and industry factors (our model uses 45 systemic factors) and the weight for the specific factors, called R^2
- The covariance matrix between the country and industry factors

Modeling rating migration: The rating migration methodology requires additional information, which is internal to the model rather than input by the user: the transition matrix, describing the probabilities of migrating between different credit ratings, and a yield curve.

- Migration matrix: For K non-default credit rating grades and 1 default credit rating, a migration matrix is a $(K + 1) \times (K + 1)$ matrix with entries π_{ij} . It expresses in percentage terms the probability π_{ij} that any borrower with the credit rating i moves to the credit rating j in the next time step. Different migration matrices are used according to the length of the 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.

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 99.98 %, 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 (99.98 %). 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 as 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 excluding the correlation trading portfolio;
- Securitized products in the trading book excluding the correlation trading portfolio;
- Correlation trading portfolio.

The traded default risk EC for the correlation trading portfolio is calculated using the comprehensive risk measure model. For all other positions the TDR methodology risk 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 6 months 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 99.98 % 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 MRM 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 the trading book and internal assessments for the banking book as for credit risk economic capital. Rating migrations are governed by 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 Bank uses the Advanced Measurement Approach (“AMA”). The economic capital is set at a 99.98 % percentile to absorb very severe unexpected losses within one year. Apart from different confidence levels, we use the same data input and methodology for the calculation of regulatory and economic capital requirements.

For detailed information on our operational risk measurement approaches refer to our Pillar 3 report section “Operational Risk Capital Measurement”.

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. It covers a twelve months time-horizon and is calculated with a confidence of 99.98 %, in line with our general economic capital definition.

Tax risk is determined by reference to tax re-determination risk with respect to transactions of a structured capital markets nature undertaken by the Bank. The portfolio of these transactions is now almost entirely of a legacy nature. Tax re-determination risk is the risk that the eventual actual tax treatment of relevant transactions differs from that determined by the Bank because of a judicial determination or challenge by a tax authority. Examples of tax re-determination risk include a tax ceasing to be creditable, 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 that specifies correlations between individual transactions. The notional exposure for each "tax issue" is determined based on adjustments reflecting the technical robustness of the Bank's position, the one-year risk horizon of the Bank, and reserves. A probability is assigned to each "tax issue". Tax risk EC is computed at the 99.98 % 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. To the extent correlations between these risk types fall below 1.0, a risk type diversification benefit results. 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 Risk Profile in our Risk Report for the diversification amount across credit risk, market risk, operational risk and business risk.

Stress Testing

We have a strong commitment to stress testing performed on a regular basis in order to assess the impact of a severe economic downturn on our risk profile and financial position. These exercises complement traditional risk measures and represent an integral part of our strategic and capital planning process. Our stress testing framework comprises regular Group-wide stress tests based on internally defined benchmark and more severe macroeconomic global downturn scenarios. We include all material risk types into our stress testing exercises. The time-horizon of internal stress tests is generally one year and can be extended to multi-year, if required by the scenario assumptions. Our methodologies undergo regular scrutiny from Deutsche Bank's internal validation team (Global Model Validation and Governance - GMVG) whether they correctly capture the impact of a given stress scenario. These analyses are complemented by portfolio- and country-specific stress tests as well as regulatory requirements, such as annual reverse stress tests and additional stress tests requested by our regulators on group or legal entity level. Examples for regulatory stress tests performed in 2016 are the EBA stress test at Group level and the CCAR stress test for the US entity. Moreover, capital plan stress testing is performed to assess the viability of our capital plan in adverse circumstances and to demonstrate a clear link between risk appetite, business strategy, capital plan and stress testing. An integrated procedure allows us to assess the impact of ad-hoc scenarios that simulate potential imminent financial or geopolitical shocks.

The initial phase of our internal stress tests consists of defining a macroeconomic downturn scenario by ERM Risk Research in cooperation with business specialists. ERM Risk Research monitors the political and economic development around the world and maintains a macro-economic heat map that identifies potentially harmful scenarios. Based on quantitative models and expert judgments, economic parameters such as foreign exchange rates, interest rates, GDP growth or unemployment rates are set accordingly to reflect the impact on our business. The scenario parameters are translated into specific risk drivers by subject matter experts in the risk units. Based on our internal models framework for stress testing, the following major metrics are calculated under stress: risk-weighted assets, impacts on profit and loss and economic capital by risk type. These results are aggregated at the Group level, and key metrics such as the SNLP, the CET 1 ratio, ICA ratio and Leverage Ratio under stress are derived. Prior to the impact assessment the scenarios are discussed and approved by the Enterprise Risk Committee (ERC) which also reviews the final stress results. After comparing these results against our defined risk appetite, the ERC also discusses specific mitigation actions to remediate the stress impact in alignment with the overall strategic and capital plan if certain limits are breached. The results also feed into the recovery planning which is crucial for the recoverability of the Bank in times of crisis. The outcome is presented to senior management up to the Management Board to raise awareness on the highest level as it provides key insights into specific business vulnerabilities and contributes to the overall risk profile assessment of the bank. The group wide stress tests performed in 2016 indicated that the bank's capitalization together with available mitigation measures allow to reach the internally set stress exit level being well above regulatory early intervention levels. A reverse stress test is performed annually in order to challenge our business model to determine the severity of scenarios that would cause us to become unviable. Such a reverse stress test is based on a hypothetical macroeconomic scenario and idiosyncratic events and takes into account severe impacts of major risks on our results. Comparing the hypothetical scenario that would be necessary to result in our non-viability according to the reverse stress, to the current economic environment, we consider the probability of occurrence of such a hypothetical macroeconomic scenario as extremely low. Given the extremely low probability of the reverse stress test scenario, we do not believe that our business continuity is at risk.

Regulatory Capital

Overview

Capital Adequacy

The calculation of our regulatory capital incorporates the capital requirements following the “Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms” (Capital Requirements Regulation or “CRR”) and the “Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms” (Capital Requirements Directive 4 or “CRD 4”) as implemented into German law. The information in this section as well as in the section “Development of risk-weighted Assets” is based on the regulatory principles of consolidation.

This section refers to the capital adequacy of the group of institutions consolidated for banking regulatory purposes pursuant to the CRR and the German Banking Act (“Kreditwesengesetz” or “KWG”). Therein not included are insurance companies or companies outside the finance sector. Our insurance companies are included in an additional capital adequacy (also “solvency margin”) calculation under the German Solvency Regulation for Financial Conglomerates. Our solvency margin as a financial conglomerate remains dominated by our banking activities.

The total regulatory capital pursuant to the effective regulations as of year-end 2016 comprises Tier 1 and Tier 2 (T2) capital. Tier 1 capital is subdivided into Common Equity Tier 1 (CET 1) capital and Additional Tier 1 (AT1) capital.

Common Equity Tier 1 (CET 1) capital consists primarily of common share capital (reduced by own holdings) including related share premium accounts, retained earnings (including losses for the financial year, if any) and accumulated other comprehensive income, subject to regulatory adjustments (i.e. prudential filters and deductions). Prudential filters for CET 1, according to Articles 32 to 35 CRR, include (i) securitization gain on sale, (ii) cash flow hedges and changes in the value of own liabilities, and (iii) additional value adjustments. CET 1 capital deductions comprise (i) intangible assets, (ii) deferred tax assets that rely on future profitability, (iii) negative amounts resulting from the calculation of expected loss amounts, (iv) net defined benefit pension fund assets, (v) reciprocal cross holdings in the capital of financial sector entities and, (vi) significant and non-significant investments in the capital (CET 1, AT1, T2) of financial sector entities above certain thresholds. All items not deducted (i.e., amounts below the threshold) are subject to risk-weighting.

Additional Tier 1 (AT1) capital consists of AT1 capital instruments and related share premium accounts as well as noncontrolling interests qualifying for inclusion in consolidated AT1, and during the transitional period grandfathered instruments eligible under earlier frameworks. To qualify as AT1 under CRR/CRD 4, instruments must have principal loss absorption through a conversion to common shares or a write-down mechanism allocating losses at a trigger point and must also meet further requirements (perpetual with no incentive to redeem; institution must have full dividend/coupon discretion at all times, etc.).

Tier 2 (T2) capital comprises eligible capital instruments, the related share premium accounts and subordinated long-term debt, certain loan loss provisions and noncontrolling interests that qualify for inclusion in consolidated T2. To qualify as T2, capital instruments or subordinated debt must have an original maturity of at least five years. Moreover, eligible capital instruments may inter alia not contain an incentive to redeem, a right of investors to accelerate repayment, or a credit sensitive dividend feature.

Capital instruments that no longer qualify as AT1 or T2 capital under the CRR/CRD 4 fully loaded rules are subject to grandfathering rules during transitional period and are phased out from 2013 to 2022 with their recognition capped at 60 % in 2016 and the cap decreasing by 10 % every year.

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 (www.db.com/ir/capital-instruments). In addition, this website provides full terms and conditions of all Common Equity Tier 1, Additional Tier 1 and Tier 2 capital instruments.

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 2016. 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 2016.

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

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

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

The countercyclical capital buffer is deployed in a jurisdiction when excess credit growth is associated with an increase in system-wide risk. It may vary between 0 % and 2.50 % CET 1 capital of RWA by 2019. In exceptional cases, it could also be higher than 2.50 %. The institution specific countercyclical buffer that applies to Deutsche Bank is the weighted average of the countercyclical capital buffers that apply in the jurisdictions where our relevant credit exposures are located. As per December 31, 2016 (and currently), the institution-specific countercyclical capital buffer was at 0.01 %.

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 2016 (and currently), 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 is applied in steps of 0.66 % in 2017, 1.32 % in 2018 and 2.00 % in 2019. As of the year-end 2016, no O-SII buffer applied to Deutsche Bank.

Unless certain exceptions apply, only the higher of the systemic risk buffer, G-SII buffer and O-SII buffer must be applied. Accordingly, the O-SII buffer is currently not applied because it is lower than the G-SII buffer.

In addition, pursuant to the Pillar 2 Supervisory Review and Evaluation Process (SREP), the European Central Bank (ECB) may impose capital requirements on individual banks which are more stringent than statutory requirements (so-called Pillar 2 requirement). On December 4, 2015, the ECB informed Deutsche Bank that the consolidated Group has to keep a CET 1 ratio of at least 10.25 % on a phase-in basis under applicable transitional rules under CRR/CRD 4 at all times. Considering the G-SII buffer of 0.50 % and the countercyclical buffer of 0.01 %, our overall CET 1 requirements amounted to 10.76 % as of December 31, 2016. Correspondingly the requirements for Deutsche Bank's Tier 1 capital ratio were at 12.26 % and total capital ratio at 14.26 % as of December 31, 2016.

On December 8, 2016, Deutsche Bank has been informed by the ECB of its decision regarding prudential minimum capital requirements for 2017, following the results of the 2016 SREP. The decision requires Deutsche Bank to maintain a phase-in CET 1 ratio of at least 9.51 % on a consolidated basis, beginning on January 1, 2017. This CET 1 capital requirement comprises the Pillar 1 minimum capital requirement of 4.50 %, the Pillar 2 requirement (SREP Add-on) of 2.75 %, the phase-in capital conservation buffer of 1.25 %, the countercyclical buffer (currently 0.01 %) and the phase-in G-SII buffer following Deutsche Bank's designation as a global systemically important institution ("G-SII") of 1.00 %. The new CET 1 capital requirement of 9.51 % for 2017 is lower than the CET 1 capital requirement of 10.76 %, which was applicable to Deutsche Bank in 2016. Correspondingly, 2017 requirements for Deutsche Bank's Tier 1 capital ratio are at 11.01 % and for its total capital ratio at 13.01 %. Also, following the results of the 2016 SREP, the ECB communicated to us an individual expectation to hold a further "Pillar 2" CET 1 capital add-on, commonly referred to as the "Pillar 2" guidance'. The capital add-on pursuant to the "Pillar 2" guidance is separate from and in addition to the Pillar 2 requirement. The ECB has stated that it expects banks to meet the "Pillar 2" guidance although it is not legally binding, and failure to meet the "Pillar 2" guidance does not automatically trigger legal action.

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 2016 and 2017 (articulated on a phase-in basis):

Overview total capital requirements and capital buffers

	2016	2017
Pillar 1		
Minimum CET 1 requirement	4.50 %	4.50 %
Capital Conservation Buffer	0.625 %	1.25 %
Countercyclical Buffer	0.01 %	0.01 % ¹
G-SII Buffer ³	0.50 %	1.00 %
O-SII Buffer ³	0.00 %	0.66 %
Systemic Risk Buffer ³	0.00 %	0.00 % ²
Pillar 2		
Pillar 2 SREP Add-on of CET 1 capital	5.125 %	2.75 %
SREP CET 1 Requirement	10.25 %	8.50 %
Total CET 1 requirement from Pillar 1 and 2⁴	10.76 %	9.51 %
Total Tier 1 requirement from Pillar 1 and 2	12.26 %	11.01 %
Total capital requirement from Pillar 1 and 2	14.26 %	13.01 %

¹ Deutsche Bank's countercyclical buffer requirement is subject to country-specific buffer rates decreed by EBA and the Basel Committee of Banking Supervision (BCBS) as well as Deutsche Bank's relevant credit exposures as per respective reporting date. The countercyclical buffer rate for 2017 has been assumed to be 0.01 % due to unavailability of 2017 data.

² The systemic risk buffer has been assumed to remain at 0 % for the projected year 2017, subject to changes based on further directives.

³ Unless certain exceptions apply only the higher of the systemic risk buffer, G-SII and O-SII buffer must be applied.

⁴ 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.

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.

Institution-specific countercyclical capital buffer

	Dec 31, 2016
Total risk exposure amount (in € m.)	356,235
Institution specific countercyclical buffer rate	0.01 %
Institution specific countercyclical buffer requirement (in € m.)	40

Countercyclical capital buffer rates are determined by Basel Committee member jurisdictions. Countercyclical capital buffer varies according to a percentage of risk weighted assets. The "General credit exposures" include only credit exposures to the private sector. Exposures to the public sector and to institutions are not in scope. The "Trading book exposures" contain market risk standardized approach non-securitization and trading book securitization positions as well as IRC ("Incremental Risk Charge") and CTP ("Correlation Trading Portfolio") related positions.

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

in € m.	Dec 31, 2016					
	General credit exposures		Trading book exposures		Securitization exposures	
	Exposure value for SA	Exposure value for IRB	Sum of long and short positions of trading book exposures for SA	Value of trading book exposures for Internal models	Exposure value for SA	Exposure value for IRB
Argentina	6	343	0	86	0	0
Australia	210	2,329	866	72	0	328
Austria	38	1,561	45	466	0	0
Belgium	36	1,862	3	37	0	0
Bermuda	12	1,462	0	0	0	55
Brazil	53	1,602	0	183	0	0
British Virgin Islands	53	8,213	0	12	0	0
Canada	47	3,460	21	152	0	2,001
Cayman Islands	318	6,420	203	15	0	674
China	33	6,220	272	15	0	0
Denmark	0	1,323	0	0	0	0
Finland	27	739	4	0	0	0
France	40	6,083	263	289	0	947
Germany	3,675	227,851	136	1,611	0	7,491
Greece	2	1,708	0	0	0	0
Hong Kong	62	4,711	0	97	0	0
India	1,690	6,205	0	1,025	0	3,290
Indonesia	8	2,034	0	113	0	0
Ireland	976	6,284	273	0	3	2,996
Israel	0	763	0	63	0	0
Italy (incl. San Marino)	1,987	21,872	103	0	38	197
Japan	194	2,422	248	0	0	225
Jersey	115	1,739	0	70	175	0
Luxembourg	2,059	11,535	81	44	0	1,996
Malaysia	86	1,089	0	503	0	0
Mauritius	100	193	0	26	0	0
Mexico	23	958	0	559	0	0
Netherlands	1,642	14,691	109	0	0	297
New Zealand	25	654	44	6	0	0
Norway	27	1,468	3	0	0	0
Pakistan	0	291	0	0	0	0
Philippines	18	541	0	77	0	0
Poland	521	7,162	0	0	0	0
Portugal	50	2,377	74	66	19	0
Russian Federation	16	1,457	0	178	0	0
Saudi Arabia	37	12,923	0	26	0	0
Singapore	193	6,805	0	142	0	93
South Africa	7	591	0	178	0	0
South Korea	2	7,237	0	1,046	0	0
Spain	307	14,909	342	519	0	30
Sweden	1	1,600	10	0	210	0
Switzerland	26	11,035	13	206	0	0
Taiwan	2	1,518	0	11	0	0
Thailand	6	1,399	0	0	0	0
Turkey	15	3,311	0	249	0	0
United Arab Emirates	98	1,667	77	0	0	0
United Kingdom	823	19,118	2,011	0	170	636
United States of America (incl. Puerto Rico)	1,383	98,882	4,294	0	1,973	52,245
Venezuela	0	220	0	98	0	0
Other	110	14,306	0	762	0	546
Total	17,159	555,146	9,495	9,001	2,588	74,047

Dec 31, 2016

in € m.	Own funds requirements				Own funds requirements weights	Countercyclical capital buffer rate (in %)
	of which: General credit exposures	of which: Trading book exposures	of which: Securitization exposures	Total		
Argentina	22	4	0	26	0.00	0.00
Australia	108	63	16	187	0.01	0.00
Austria	53	17	0	71	0.00	0.00
Belgium	42	5	4	52	0.00	0.00
Bermuda	61	0	3	64	0.00	0.00
Brazil	51	9	5	65	0.00	0.00
British Virgin Islands	48	0	0	48	0.00	0.00
Canada	85	4	20	109	0.01	0.00
Cayman Islands	324	16	20	360	0.02	0.00
China	216	18	3	238	0.01	0.00
Denmark	26	1	1	27	0.00	0.00
Finland	20	0	1	21	0.00	0.00
France	185	24	45	254	0.01	0.00
Germany	5,876	55	67	5,998	0.35	0.00
Greece	69	17	0	86	0.00	0.00
Hong Kong	110	4	1	115	0.01	0.625
India	269	119	27	415	0.02	0.00
Indonesia	77	22	3	102	0.01	0.00
Ireland	235	25	125	384	0.02	0.00
Israel	43	9	0	52	0.00	0.00
Italy (incl. San Marino)	872	34	15	920	0.05	0.00
Japan	82	0	1	83	0.00	0.00
Jersey	99	2	7	109	0.01	0.00
Luxembourg	381	9	15	405	0.02	0.00
Malaysia	43	11	1	55	0.00	0.00
Mauritius	23	2	1	26	0.00	0.00
Mexico	35	25	3	63	0.00	0.00
Netherlands	529	25	26	580	0.03	0.00
New Zealand	29	0	0	29	0.00	0.00
Norway	34	0	1	34	0.00	1.50
Pakistan	26	0	0	26	0.00	0.00
Philippines	21	3	0	24	0.00	0.00
Poland	207	0	0	207	0.01	0.00
Portugal	39	17	2	58	0.00	0.00
Russian Federation	43	4	0	47	0.00	0.00
Saudi Arabia	109	1	1	111	0.01	0.00
Singapore	148	11	13	172	0.01	0.00
South Africa	29	15	0	44	0.00	0.00
South Korea	65	3	0	68	0.00	0.00
Spain	517	36	3	557	0.03	0.00
Sweden	40	0	9	49	0.00	1.50
Switzerland	189	10	1	200	0.01	0.00
Taiwan	35	0	0	36	0.00	0.00
Thailand	44	0	1	44	0.00	0.00
Turkey	81	13	2	96	0.01	0.00
United Arab Emirates	52	5	1	58	0.00	0.00
United Kingdom	565	78	97	740	0.04	0.00
United States of America (incl. Puerto Rico)	2,522	269	556	3,347	0.19	0.00
Venezuela	2	64	0	66	0.00	0.00
Other	322	57	12	391	0.02	0.00
Total	15,105	1,106	1,110	17,321	1.00	0.01

Development of regulatory capital

Our CRR/CRD 4 Tier 1 capital as of December 31, 2016 amounted to €55.5 billion, consisting of a Common Equity Tier 1 (CET 1) capital of €47.8 billion and Additional Tier 1 (AT1) capital of €7.7 billion. The CRR/CRD 4 Tier 1 capital was €2.7 billion lower than at the end of 2015, primarily driven by a decrease in CET 1 capital of €4.6 billion since year end 2015 while AT1 capital increased by €1.9 billion in the same period.

The €4.6 billion decrease of CRR/CRD 4 CET 1 capital was largely the result of increased regulatory adjustments due to the higher phase-in rate of 60 % in 2016 compared to 40 % in 2015 and the net loss attributable to Deutsche Bank shareholders and additional equity components of €1.4 billion in 2016. The Decision (EU) (2015/4) of the ECB requires the recognition of the year end loss in CET 1 capital. On March 5, 2017 the Management Board decided to recommend a dividend of €0.19 for 2015 and 2016 to the 2017 Annual General Meeting scheduled to take place in May 2017, taking into account expected shares following the Bank's proposed capital increase. Based on this new decision, regulatory capital as of year end 2016 was impacted by an accrual deduction of €0.4 billion. This dividend accrual is in line with ECB Decision (EU) (2015/4) on the recognition of interim or year-end profits in CET 1 capital. The positive year-on-year effect of €0.6 billion under the CRR/CRD 4 transitional rules resulting from the reversal of the 15 % threshold related deductions due to the sale of our participation in Hua Xia Bank was more than offset by a number of negative effects including remeasurement losses relating to defined benefit pension plans of €0.5 billion as well as an additional capital deduction of €0.3 billion that was imposed on Deutsche Bank effective from October 2016 onwards based on a notification by the ECB pursuant to Article 16(1)(c), 16(2)(b) and (j) of Regulation (EU) No 1024/2013.

The €1.9 billion increase in CRR/CRD 4 AT1 capital was mainly the result of reduced regulatory adjustments (€1.9 billion lower than at year end 2015) that were phased out from AT1 capital. These items reflect the residual amount of certain CET 1 deductions that are subtracted from CET 1 capital under fully loaded rules, but are allowed to reduce AT1 capital during the transitional period. The phase-in rate for these deductions on the level of CET 1 capital increased to 60 % in 2016 (40 % in 2015) and decreased correspondingly on the level of AT1 capital to 40 % in 2016 (60 % in 2015).

Our fully loaded CRR/CRD 4 Tier 1 capital as of December 31, 2016 was €46.8 billion, compared to €48.7 billion at the end of 2015. Our fully loaded CRR/CRD 4 CET 1 capital amounted to €42.3 billion as of December 31, 2016, compared to €44.1 billion as of December 31, 2015. Our fully loaded CRR/CRD 4 Additional Tier 1 capital amounted to €4.6 billion as per end of December 2016, unchanged compared to year end 2015.

The decrease of our fully loaded CET 1 capital of €1.8 billion compared to year end 2015 capital was largely the result of our negative net income of €1.4 billion and the dividend accrual of €0.4 billion. The positive year-on-year effect of €1.8 billion resulting from the reversal of the 15 % threshold-related deductions due to the sale of our participation in Hua Xia Bank was almost entirely offset by a number of negative effects including higher CET 1 capital deductions of deferred tax assets on unused tax losses of €0.5 billion, remeasurement losses related to defined benefit pension plans of €0.5 billion, the additional capital deduction of €0.3 billion that was imposed on Deutsche Bank effective from October 2016 onwards and a further decrease of €0.5 billion mainly driven by net unrealized losses on financial assets available for sale.

Overview of regulatory capital, RWA and capital ratios according to CRR/CRD 4

in € m.	Dec 31, 2016		Dec 31, 2015	
	CRR/CRD 4 fully loaded	CRR/CRD 4	CRR/CRD 4 fully loaded	CRR/CRD 4
Common Equity Tier 1 capital before regulatory adjustments ¹	59,088	59,104	61,766	62,042
Total regulatory adjustments to Common Equity Tier 1 capital	(16,810)	(11,321)	(17,665)	(9,613)
Common Equity Tier 1 (CET 1) capital	42,279	47,782	44,101	52,429
Additional Tier 1 capital before regulatory adjustments	4,676	11,191	4,676	11,157
Total regulatory adjustments to Additional Tier 1 capital	(125)	(3,488)	(125)	(5,365)
Additional Tier 1 (AT1) capital	4,551	7,703	4,551	5,793
Tier 1 capital (T1 = CET 1 + AT1)	46,829	55,486	48,651	58,222
Tier 2 capital before regulatory adjustments	12,927	6,988	12,395	6,622
Total regulatory adjustments to Tier 2 capital	(254)	(316)	(71)	(323)
Tier 2 (T2) capital	12,673	6,672	12,325	6,299
Total capital (TC = T1 + T2)	59,502	62,158	60,976	64,522
Total risk-weighted assets	357,518	356,235	396,714	397,382
Capital ratios				
Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets)	11.8	13.4	11.1	13.2
Tier 1 capital ratio (as a percentage of risk-weighted assets)	13.1	15.6	12.3	14.7
Total capital ratio (as a percentage of risk-weighted assets)	16.6	17.4	15.4	16.2

¹ Reflects the Management Board's decision to propose a dividend per share of €0.19 for 2015 and 2016 taking into consideration the expected shares to be issued before the Annual General Meeting in May 2017.

Details

Reconciliation of Consolidated Balance Sheet according to IFRS to regulatory Balance Sheet

in € m.	Dec. 31, 2016			Dec. 31, 2015			References ¹
	Financial Balance Sheet	Deconsolidation/Consolidation of entities	Regulatory Balance Sheet	Financial Balance Sheet	Deconsolidation/Consolidation of entities	Regulatory Balance Sheet	
Assets:							
Cash and central bank balances	181,364	(100)	181,263	96,940	(87)	96,853	
Interbank balances (w/o central banks)	11,606	(1,451)	10,156	12,842	(2,432)	10,410	
Central bank funds sold and securities purchased under resale agreements	16,287	0	16,287	22,456	0	22,456	
Securities borrowed	20,081	(7)	20,074	33,557	(5)	33,552	
Financial assets at fair value through profit or loss							
Trading assets	171,044	(4,299)	166,744	196,035	(3,331)	192,704	
Positive market values from derivative financial instruments	485,150	2,395	487,545	515,594	2,313	517,907	
Financial assets designated at fair value through profit or loss	87,587	(1,152)	86,434	109,253	(12,701)	96,552	
Total financial assets at fair value through profit or loss	743,781	(3,057)	740,724	820,883	(13,719)	807,163	
Financial assets available for sale	56,228	4,020	60,248	73,583	20,473	94,056	
Equity method investments	1,027	(45)	982	1,013	(76)	937	h
Thereof: Goodwill	66	0	66	28	0	28	e
Loans	408,909	1,677	410,586	427,749	1,061	428,810	
Securities held to maturity	3,206	0	3,206	0	0	0	
Property and equipment	2,804	(174)	2,630	2,846	(209)	2,638	
Goodwill and other intangible assets	8,982	(238)	8,745	10,078	(1,330)	8,748	e
Other assets	126,045	(117)	125,929	118,137	(404)	117,734	
Thereof: Defined benefit pension fund assets	945	0	945	1,173	(0)	1,173	g
Assets for current tax	1,559	(9)	1,549	1,285	(129)	1,155	
Deferred tax assets	8,666	(18)	8,648	7,762	(7)	7,755	f
Total assets	1,590,546	481	1,591,027	1,629,130	3,136	1,632,266	
Liabilities and equity:							
Deposits	550,204	4,417	554,621	566,974	5,725	572,699	
Central bank funds purchased and securities sold under repurchase agreements	25,740	0	25,740	9,803	0	9,803	
Securities loaned	3,598	(6)	3,592	3,270	(5)	3,266	
Financial liabilities at fair value through profit or loss							
Trading liabilities	57,029	(98)	56,931	52,304	(190)	52,115	
Negative market values from derivative financial instruments	463,858	2,361	466,219	494,076	301	494,377	
Financial liabilities designated at fair value through profit or loss	60,492	(911)	59,581	44,852	(1,196)	43,655	
Investment contract liabilities	592	(592)	0	8,522	(8,522)	0	
Total financial liabilities at fair value through profit or loss	581,971	760	582,731	599,754	(9,607)	590,148	
Other short-term borrowings	17,295	(409)	16,886	28,010	(1,519)	26,491	
Other liabilities	155,440	(5,125)	150,315	175,005	(12,156)	162,849	
Provisions	10,973	(32)	10,941	9,207	(70)	9,137	
Liabilities for current tax	1,329	(15)	1,314	1,699	(149)	1,550	
Deferred tax liabilities	486	(87)	399	746	(295)	451	
Long-term debt	172,316	921	173,237	160,016	21,505	181,521	
Thereof: Subordinated long-term debt ²	7,762	0	7,762	7,826	0	7,826	j, k
Trust preferred securities ²	6,373	301	6,674	7,020	388	7,409	j, k
Obligation to purchase common shares	0	0	0	0	0	0	
Total liabilities	1,525,727	724	1,526,451	1,561,506	3,817	1,565,323	
Common shares, no par value, nominal value of € 2.56	3,531	0	3,531	3,531	0	3,531	a
Additional paid-in capital	33,765	(6)	33,760	33,572	(5)	33,568	a
Retained earnings	18,987	(276)	18,711	21,182	(251)	20,931	b
Common shares in treasury, at cost	0	0	0	(10)	0	(10)	a
Equity classified as obligation to purchase common shares	0	0	0	0	0	0	
Accumulated other comprehensive income, net of tax	3,550	159	3,708	4,404	(307)	4,096	c
Total shareholders' equity	59,833	(123)	59,710	62,678	(563)	62,115	
Additional equity components ²	4,669	0	4,669	4,675	0	4,675	i
Noncontrolling interests	316	(120)	197	270	(118)	153	d
Total equity	64,819	(243)	64,576	67,624	(681)	66,943	
Total liabilities and equity	1,590,546	481	1,591,027	1,629,130	3,136	1,632,266	

¹ References provide the mapping of regulatory balance sheet items used to calculate regulatory capital as reflected in the column "References" in "Transitional template for regulatory capital, RWA and capital ratios". Where applicable, more detailed information are provided in the respective reference footnote section.

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

Transitional template for regulatory capital, RWA and capital ratios

in € m.	Dec 31, 2016		Dec 31, 2015		References ¹
	CRR/CRD 4 fully-loaded	CRR/CRD 4	CRR/CRD 4 fully loaded	CRR/CRD 4	
Common Equity Tier 1 (CET 1) capital: instruments and reserves					
Capital instruments and the related share premium accounts	37,290	37,290	37,088	37,088	a
Thereof: Ordinary shares ²	37,290	37,290	37,088	37,088	a
Retained earnings	20,113	20,113	27,607	27,607	b
Accumulated other comprehensive income (loss), net of tax	3,708	3,645	4,096	4,281	c
Funds for general banking risk	0	0	0	0	
Amount of qualifying items referred to in Art. 484 (3) CRR and the related share premium accounts subject to phase-out from CET 1	N/M	0	N/M	0	
Public sector capital injections grandfathered until January 1, 2018	N/M	N/M	N/M	N/M	
Noncontrolling Interests (amount allowed in consolidated CET 1)	0	79	0	92	d
Independently reviewed interim profits net of any foreseeable charge or dividend ³	(2,023)	(2,023)	(7,025)	(7,025)	b
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	59,088	59,104	61,766	62,042	
Common Equity Tier 1 (CET 1) capital: regulatory adjustments					
Additional value adjustments (negative amount) ⁴	(1,398)	(1,398)	(1,877)	(1,877)	
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(8,436)	(5,062)	(8,439)	(3,376)	e
Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (negative amount)	(3,854)	(2,312)	(3,310)	(1,324)	f
Fair value reserves related to gains or losses on cash flow hedges	(195)	(195)	(196)	(196)	
Negative amounts resulting from the calculation of expected loss amounts	(297)	(188)	(106)	(58)	
Any increase in equity that results from securitized assets (negative amount)	(5)	(5)	(20)	(20)	
Gains or losses on liabilities designated at fair value resulting from changes in own credit standing ⁵	(440)	(228)	(407)	(114)	
Defined benefit pension fund assets (negative amount)	(945)	(567)	(1,173)	(469)	g
Direct, indirect and synthetic holdings by an institution of own CET 1 instruments (negative amount) ⁶	(59)	(41)	(76)	(39)	
Direct, indirect and synthetic holdings of the CET 1 instruments of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount)	0	0	0	0	
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above the 10 % threshold and net of eligible short positions) (negative amount) ⁷	0	0	0	0	
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above 10 % threshold and net of eligible short positions) (negative amount)	0	0	0	0	
Exposure amount of the following items which qualify for a risk weight of 1250 %, where the institution opts for the deduction alternative	0	0	0	0	
Thereof:					
Qualifying holdings outside the financial sector (negative amount)	0	0	0	0	
Securitization positions (negative amount)	0	0	0	0	
Free deliveries (negative amount)	0	0	0	0	
Deferred tax assets arising from temporary differences (amount above 10 % threshold, net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (negative amount)	(590)	(354)	0	0	f
Amount exceeding the 15 % threshold (negative amount)	0	0	(1,770)	(602)	
Thereof:					
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	(818)	(278)	h
Deferred tax assets arising from temporary differences	0	0	(953)	(324)	f
Losses for the current financial year (negative amount)	0	0	0	0	
Regulatory adjustments applied to CET 1 capital in respect of amounts subject to pre-CRR treatment:	N/M	0	N/M	0	
Regulatory adjustments relating to unrealized gains and losses pursuant to Art. 467 and 468 CRR	N/M	(380)	N/M	(1,246)	
Amount to be deducted from or added to CET 1 capital with regard to additional filters and deductions required pre CRR ⁸	(231)	(231)	(291)	(291)	
Qualifying AT1 deductions that exceed the AT1 capital of the institution (negative amount)	0	0	0	0	
Other regulatory adjustments	(360)	(360)	0	0	
Total regulatory adjustments to Common Equity Tier 1 (CET 1) capital	(16,810)	(11,321)	(17,665)	(9,613)	
Common Equity Tier 1 (CET 1) capital	42,279	47,782	44,101	52,429	

in € m.	Dec 31, 2016		Dec 31, 2015		References ¹
	CRR/CRD 4 fully-loaded	CRR/CRD 4	CRR/CRD 4 fully loaded	CRR/CRD 4	
Additional Tier 1 (AT1) capital: instruments					
Capital instruments and the related share premium accounts	4,676	4,676	4,676	4,676	i
Thereof:					
Classified as equity under applicable accounting standards	4,676	4,676	4,676	4,676	i
Classified as liabilities under applicable accounting standards	0	0	0	0	
Amount of qualifying items referred to in Art. 484 (4) CRR and the related share premium accounts subject to phase out from AT1	N/M	6,516	N/M	6,482	j
Public sector capital injections grandfathered until January 1, 2018	N/M	N/M	N/M	N/M	
Tier 1 capital included in consolidated AT1 capital issued by subsidiaries and held by third parties	0	0	0	0	
Thereof: instruments issued by subsidiaries subject to phase out	N/M	0	N/M	0	
Additional Tier 1 (AT1) capital before regulatory adjustments	4,676	11,191	4,676	11,157	
Additional Tier 1 (AT1) capital: regulatory adjustments					
Direct, indirect and synthetic holdings by an institution of own AT1 instruments (negative amount)	(125)	(51)	(125)	(48)	i
Direct, indirect and synthetic holdings of the AT1 instruments of financial sector entities where those entities have reciprocal cross holdings with the institution designed to inflate artificially the own funds of the institution (negative amount)	0	0	0	0	
Direct, indirect and synthetic holdings of the AT1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above the 10 % threshold and net of eligible short positions) (negative amount) ⁷	0	0	0	0	
Direct, indirect and synthetic holdings by the institution of the AT1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above the 10 % threshold net of eligible short positions) (negative amount)	0	0	0	0	
Regulatory adjustments applied to AT1 capital in respect of amounts subject to pre-CRR treatment and transitional treatments subject to phase out as prescribed in CRR (i.e., residual amounts)	N/M	0	N/M	0	
Residual amounts deducted from AT1 capital with regard to deduction from CET 1 capital during the transitional period pursuant to Art. 472 CRR	N/M	(3,437)	N/M	(5,316)	
Thereof:					
Goodwill and other intangible assets (net of related tax liabilities)	N/M	(3,375)	N/M	(5,064)	e
Negative amounts resulting from the calculation of expected loss amounts	N/M	(63)	N/M	(44)	
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	N/M	0	N/M	(209)	h
Residual amounts deducted from AT1 capital with regard to deduction from Tier 2 (T2) capital during the transitional period pursuant to Art. 475 CRR	N/M	0	N/M	0	
Amount to be deducted from or added to AT1 capital with regard to additional filters and deductions required pre CRR	N/M	0	N/M	0	
Qualifying T2 deductions that exceed the T2 capital of the institution (negative amount)	0	0	0	0	
Total regulatory adjustments to Additional Tier 1 (AT1) capital	(125)	(3,488)	(125)	(5,365)	
Additional Tier 1 (AT1) capital	4,551	7,703	4,551	5,793	
Tier 1 capital (T1 = CET 1 + AT1)	46,829	55,486	48,651	58,222	
Tier 2 (T2) capital: instruments and provisions					
Capital instruments and the related share premium accounts ⁹	12,492	6,464	11,672	5,757	k
Amount of qualifying items referred to in Art. 484 (5) CRR and the related share premium accounts subject to phase out from T2	N/M	0	N/M	0	k
Public sector capital injections grandfathered until January 1, 2018	N/M	N/M	N/M	N/M	
Qualifying own funds instruments included in consolidated T2 capital issued by subsidiaries and held by third parties	435	524	723	865	k
Thereof: instruments issued by subsidiaries subject to phase out	N/M	0	N/M	0	
Credit risk adjustments	0	0	0	0	
Tier 2 (T2) capital before regulatory adjustments	12,927	6,988	12,395	6,622	

in € m.	Dec 31, 2016		Dec 31, 2015		References ¹
	CRR/CRD 4 fully-loaded	CRR/CRD 4	CRR/CRD 4 fully loaded	CRR/CRD 4	
Tier 2 (T2) capital: regulatory adjustments					
Direct, indirect and synthetic holdings by an institution of own T2 instruments and subordinated loans (negative amount)	(254)	(253)	(71)	(71)	k
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	
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) ⁷	0	0	0	0	
Thereof:					
New holdings not subject to transitional arrangements	N/M	N/M	N/M	N/M	
Holdings existing before January 1, 2013 and subject to transitional arrangements	N/M	N/M	N/M	N/M	
Direct, indirect and synthetic 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	
Regulatory adjustments applied to Tier 2 in respect of amounts subject to pre-CRR treatment and transitional treatments subject to phase-out as prescribed in CRR (i.e., residual amounts)	N/M	0	N/M	0	
Residual amounts deducted from Tier 2 capital with regard to deduction from Common Equity Tier 1 capital during the transitional period pursuant to Art. 472 CRR	N/M	(63)	N/M	(252)	
Thereof:					
Negative amounts resulting from the calculation of expected loss amounts	N/M	(63)	N/M	(44)	
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	N/M	0	N/M	(209)	h
Residual amounts deducted from Tier 2 capital with regard to deduction from Additional Tier 1 capital during the transitional period pursuant to Art. 475 CRR	N/M	0	N/M	0	
Thereof:					
Reciprocal cross holdings in AT1 instruments	N/M	0	N/M	0	
Direct holdings of nonsignificant investments in the capital of other financial sector entities	N/M	0	N/M	0	
Amount to be deducted from or added to Tier 2 capital with regard to additional filters and deductions required pre-CRR	0	0	0	0	
Total regulatory adjustments to Tier 2 (T2) capital	(254)	(316)	(71)	(323)	
Tier 2 (T2) capital	12,673	6,672	12,325	6,299	
Total capital (TC = T1 + T2)	59,502	62,158	60,976	64,522	
Risk-weighted assets in respect of amounts subject to pre-CRR treatment and transitional treatments subject to phase-out as prescribed in CRR (i.e., residual amounts) ¹⁰	N/M	0	N/M	0	
Thereof:					
Items not deducted from CET 1 (CRR residual amounts)	N/M	0	N/M	0	
Items not deducted from AT1 items (CRR residual amounts)	N/M	0	N/M	0	
Items not deducted from T2 items (CRR residual amounts)	N/M	0	N/M	0	
Thereof:					
Indirect and synthetic holdings of own T2 instruments	N/M	0	N/M	0	
Indirect and synthetic holdings of nonsignificant investments in the capital of other financial sector entities	N/M	0	N/M	0	
Indirect and synthetic holdings of significant investments in the capital of other financial sector entities	N/M	0	N/M	0	
Total risk-weighted assets	357,518	356,235	396,714	397,382	
Thereof:					
Credit Risk (including Settlement Risk)	221,665	220,381	241,360	242,028	
Credit Valuation Adjustment (CVA)	9,416	9,416	15,877	15,877	
Market Risk	33,762	33,762	49,553	49,553	
Operational Risk	92,675	92,675	89,923	89,923	
Capital ratios and buffers					
Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets)	11.8	13.4	11.1	13.2	
Tier 1 capital ratio (as a percentage of risk-weighted assets)	13.1	15.6	12.3	14.7	
Total capital ratio (as a percentage of risk-weighted assets)	16.6	17.4	15.4	16.2	
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)	9.0	5.6	9.0	4.5	
Thereof:					
Capital conservation buffer requirement	2.5	0.625	2.5	0.0	
Countercyclical buffer requirement	N/M	0.01	N/M	N/M	
Systemic risk buffer requirement	0.0	0.0	0.0	0.0	
Global Systemically Important Institution (G-SII) or Other Systemically Important Institution (O-SII) buffer	2.0	0.5	2.0	0.0	
Common Equity Tier 1 capital available to meet buffers (as a percentage of risk-weighted assets) ¹¹	7.1	8.8	6.3	8.2	

in € m.	Dec 31, 2016		Dec 31, 2015		References ¹
	CRR/CRD 4 fully-loaded	CRR/CRD 4	CRR/CRD 4 fully loaded	CRR/CRD 4	
Amounts below the thresholds for deduction (before risk weighting)					
Direct, indirect and synthetic holdings of the capital of financial sector entities where the institution does not have a significant investment in those entities (amount below 10 % threshold and net of eligible short positions) ⁷	3,613	3,613	2,030	2,030	
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount below 10 % threshold and net of eligible short positions)	866	866	3,056	3,178	
Deferred tax assets arising from temporary differences (amount below 10 % threshold, net of related tax liability where the conditions in Art. 38 (3) CRR are met)	4,323	4,323	3,560	3,703	
Applicable caps on the inclusion of provisions in Tier 2 capital					
Credit risk adjustments included in T2 in respect of exposures subject to standardized approach (prior to the application of the cap)	0	0	0	0	
Cap on inclusion of credit risk adjustments in T2 under standardized approach	217	217	301	301	
Credit risk adjustments included in T2 in respect of exposures subject to internal ratings-based approach (prior to the application of the cap)	0	0	0	0	
Cap for inclusion of credit risk adjustments in T2 under internal ratings-based approach	1,069	1,069	1,022	1,022	
Capital instruments subject to phase-out arrangements					
Current cap on CET 1 instruments subject to phase out arrangements	N/M	0	N/M	0	
Amount excluded from CET 1 due to cap (excess over cap after redemptions and maturities)	N/M	0	N/M	0	
Current cap on AT1 instruments subject to phase out arrangements	N/M	7,516	N/M	8,768	
Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities)	N/M	0	N/M	0	
Current cap on T2 instruments subject to phase out arrangements	N/M	2,026	N/M	2,363	
Amount excluded from T2 due to cap (excess over cap after redemptions and maturities)	N/M	0	N/M	0	

N/M – Not meaningful

¹ References provide the mapping of regulatory balance sheet items used to calculate regulatory capital as reflected in the column "References" in "Reconciliation of Consolidated Balance Sheet according to IFRS to regulatory Balance Sheet". Where applicable, more detailed information are provided in the respective reference footnote section.

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

³ Reflects the ECB decision (EU) (2015/4) from February 4, 2015 on the recognition of interim or year-end profits in CET 1 capital. Following the announcement of March 5th, 2017 to pay a dividend to common shareholders for the fiscal years 2015 and 2016, a common share dividend of €0.19 per share has been accrued.

⁴ The € 1.4 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 €0.5 billion.

⁵ Gains and losses on liabilities of the institution that are valued at fair value that result from changes in the own credit standing of the institution according to Article 33 (1) (b) CRR as well as all fair value gains and losses arising from the institution's own credit risk related to derivative liabilities according to Article 33 (1) (c) CRR.

⁶ Excludes holdings that are already considered in the accounting base of Common Equity.

⁷ Based on our current interpretation no deduction amount expected.

⁸ Prudential filter for fund for home loans and savings protection ("Fonds zur baupartechnischen Absicherung").

⁹ Amortization is taken into account.

¹⁰ Excludes risk-weighted assets for positions in the trading book which are subject to phase out as prescribed in CRR (i.e. CRR residual amounts) as attributed risk-weighted assets are calculated on a portfolio basis.

¹¹ Calculated as the CET 1 capital less any CET 1 items used to meet Tier 1 and Total capital requirements; this is before consideration of Pillar 2 SREP requirements.

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

^b The position retained earnings in the regulatory balance sheet includes net income (loss) attributable to Deutsche Bank shareholders and additional equity components of € (1,402) million (2015: € (6,794) million). This item is excluded from the position retained earnings in the transitional template for regulatory capital and shown separately along with accrual for dividend and AT1 coupons of € 621 million (2015: € 231 million) in the position independently reviewed interim profits net of any foreseeable charge or dividend.

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

^d Phase-out of noncontrolling interests at a rate of 40 % in 2016 (60 % in 2015).

^e Regulatory applicable amount is goodwill and other intangible assets of € 8,745 million (2015: € 8,748 million) plus goodwill from equity method investments of € 66 million (2015: € 28 million) as per regulatory balance sheet reduced by deferred tax liabilities on other intangibles of € 374 million (2015: € 336 million). Total CET 1 deduction amount is phased-in at a rate of 60 % in 2016 (2015: 40 %). Residual amount is deducted from AT1 capital.

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

^g Phase-in at a rate of 60 % in 2016 (40 % in 2015).

^h Disposal of Hua Xia Bank Company Limited in November 2016 as the largest position of equity method investments and the major significant holding of CET 1 instruments of financial sector entities led to a reversal of former threshold related deductions.

ⁱ Additional equity components reflects regulatory eligible AT1 capital instruments.

^j 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).

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

The following table details the main changes in our Common Equity Tier 1 capital, Additional Tier 1 and Tier 2 capital, based on the regulatory eligible amounts, from the beginning to the end of the years 2016 and 2015.

Development of regulatory capital

in € m.

	Dec 31, 2016	Dec 31, 2015
	CRR/CRD 4	CRR/CRD 4
Common Equity Tier 1 (CET 1) capital - opening amount	52,429	60,103
Common shares, net effect	0	0
Thereof:		
New shares issued (+)	0	0
Shares retired (-)	0	0
Additional paid-in capital	192	(53)
Retained earnings	(1,826)	(6,097)
Thereof:		
Actuarial gains (losses) rel. to defined benefit plans, net of tax/CTA	(517)	(10)
Net income attributable to Deutsche Bank Shareholders	(1,402)	(6,794)
Common shares in treasury, net effect/(+) sales (-) purchase	10	(3)
Movements in accumulated other comprehensive income	231	2,759
Thereof:		
Foreign currency translation, net of tax	223	2,044
Unrealized gains and losses	(261)	831
Other	269	(116)
Accrual for dividend and Additional Tier 1 (AT1) coupons ¹	(621)	(231)
Thereof:		
Gross dividends (deduction)	(393)	0
Shares issued in lieu of dividends (add back)	0	0
Gross AT1 coupons (deduction)	(229)	(231)
Additional value adjustments	479	(1,877)
Goodwill and other intangible assets (net of related tax liabilities)	(1,686)	(780)
Deferred tax assets that rely on future profitability (excluding those arising from temporary differences)	(988)	(800)
Negative amounts resulting from the calculation of expected loss amounts	(130)	89
Removal of gains/losses resulting from changes in own credit standing in liabilities designated at fair value (net of tax)	(114)	96
Defined benefit pension fund assets	(97)	(277)
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	278	(194)
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)	(30)	(191)
Other, including regulatory adjustments	(343)	(115)
Common Equity Tier 1 (CET 1) capital - closing amount	47,782	52,429
Additional Tier 1 (AT1) capital - opening amount	5,793	3,794
New Additional Tier 1 eligible capital issues	0	0
Matured and called instruments	(76)	(4,289)
Transitional arrangements	1,879	5,529
Thereof:		
Amount excluded from Additional Tier 1 capital due to cap	0	0
Goodwill and other intangible assets (net of related tax liabilities)	1,689	5,320
Negative amounts resulting from the calculation of expected loss amounts	(19)	250
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	209	(41)
Other, including regulatory adjustments	108	759
Additional Tier 1 (AT1) capital - closing amount	7,703	5,793
Tier 1 capital (T1 = CET 1 + AT1)	55,486	58,222
Tier 2 (T2) capital - opening amount	6,299	4,395
New Tier 2 eligible capital issues	764	2,818
Matured and called instruments	(64)	(315)
Amortization adjustments	(344)	(482)
Transitional arrangements	190	209
Thereof:		
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	(19)	250
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	209	(41)
Other, including regulatory adjustments	(173)	(327)
Tier 2 (T2) capital - closing amount	6,672	6,299
Total regulatory capital (TC = T1 + T2)	62,158	64,522

¹ Reflects the Management Board's decision to propose a dividend per share of €0.19 for 2015 and 2016 taking into consideration the expected shares to be issued before the Annual General Meeting in May 2017.

Reconciliation of shareholders' equity to regulatory capital

	Dec 31, 2016	Dec 31, 2015
	CRR/CRD 4	CRR/CRD 4
in € m.		
Total shareholders' equity per accounting balance sheet	59,833	62,678
Deconsolidation/Consolidation of entities	(123)	(681)
Thereof:		
Additional paid-in capital	(6)	(5)
Retained earnings	(276)	(369)
Accumulated other comprehensive income (loss), net of tax	159	(307)
Total shareholders' equity per regulatory balance sheet	59,710	61,997
Noncontrolling interest based on transitional rules	79	92
Accrual for dividend and AT1 coupons ¹	(621)	(231)
Reversal of deconsolidation/consolidation of the position Accumulated other comprehensive income (loss), net of tax, during transitional period	(63)	184
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	59,104	62,042
Prudential filters	(2,206)	(3,453)
Thereof:		
Additional value adjustments	(1,398)	(1,877)
Any increase in equity that results from securitized assets	(5)	(20)
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	(423)	(310)
Regulatory adjustments relating to unrealized gains and losses pursuant to Art. 467 and 468 CRR	(380)	(1,246)
Regulatory adjustments	(9,115)	(6,159)
Thereof:		
Goodwill and other intangible assets (net of related tax liabilities)	(5,062)	(3,376)
Deferred tax assets that rely on future profitability	(2,666)	(1,648)
Negative amounts resulting of the calculation of expected loss amounts	(188)	(58)
Defined benefit pension fund assets	(567)	(469)
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	(278)
Securitization positions not included in risk-weighted assets	0	0
Other	(632)	(330)
Common Equity Tier 1 capital	47,782	52,429
Additional Tier 1 capital	7,703	5,793
Additional Tier 1 Notes (AT1 Notes)	4,625	4,627
Per balance sheet	4,669	4,675
Deconsolidation/Consolidation of entities	0	0
Regulatory adjustments to balance sheet position	(45)	(48)
Hybrid capital securities	6,500	6,464
Per balance sheet	6,373	7,020
Deconsolidation/Consolidation of entities	301	388
Regulatory adjustments to balance sheet position	(174)	(944)
Thereof:		
Amount excluded from Additional Tier 1 due to cap	0	0
Other	(174)	(944)
Other regulatory adjustments	16	18
Deductions from Additional Tier 1 capital	(3,437)	(5,316)
Tier 1 capital	55,486	58,222
Tier 2 capital	6,672	6,299
Subordinated debt	6,447	6,263
Per balance sheet	7,762	7,826
Deconsolidation/Consolidation of entities	0	0
Regulatory adjustments to balance sheet position	(1,315)	(1,563)
Thereof:		
Amortization according to Art. 64 CRR	(1,027)	(1,321)
Other	(288)	(242)
Other regulatory adjustments	288	289
Thereof:		
Inclusion of amount excluded from Additional Tier 1 due to cap	0	0
Other	288	289
Deductions from Tier 2 capital	(63)	(252)
Total capital	62,158	64,522

¹ Reflects the Management Board's decision to propose a dividend per share of €0.19 for 2015 and 2016 taking into consideration the expected shares to be issued before the Annual General Meeting in May 2017.

Development of risk-weighted assets

The table below provides an overview of risk-weighted assets broken down by model approach and business division. It includes the aggregated effects of the segmental reallocation of infrastructure related positions if applicable as well as reallocations between the segments.

Within credit risk, the line item “Other” in advanced IRBA reflects RWA from securitization positions in the banking book, specific equity positions and other non-credit obligation assets. Within the Standardized Approach, the line item “Other” includes RWA from banking book securitizations as well as exposures assigned to the further exposure classes apart from central governments or central banks, institutions, corporates and retail.

Risk-weighted assets by model approach and business division according to transitional rules

Dec 31, 2016

in € m.	Global Markets	Corporate & Investment Banking	Private, Wealth and Commercial Clients	Deutsche Asset Management	Postbank	Non-Core Operations Unit	Consolidation & Adjustments and Other	Total
Credit Risk	61,288	62,997	36,161	3,758	36,561	4,075	15,505	220,345
Segment reallocation	1,594	2,397	990	191	0	77	(5,249)	0
Advanced IRBA	52,218	58,214	31,924	1,713	29,901	2,318	19,167	195,454
Central Governments and Central Banks	1,840	1,023	39	1	10	0	14,523	17,436
Institutions	7,903	3,168	140	31	1,205	47	778	13,272
Corporates	34,237	47,541	8,678	234	7,450	466	1,785	100,392
Retail	124	28	22,237	0	18,507	421	0	41,317
Other	8,114	6,454	830	1,447	2,729	1,383	2,081	23,038
Foundation IRBA	2,021	190	0	0	3,505	0	0	5,716
Central Governments and Central Banks	0	0	0	0	0	0	0	0
Institutions	0	0	0	0	6	0	0	6
Corporates	2,021	190	0	0	3,499	0	0	5,710
Standardized Approach	5,270	2,196	3,247	1,854	3,035	1,678	1,587	18,867
Central Governments or Central Banks	22	0	2	0	50	0	0	75
Institutions	430	5	11	0	40	1	23	509
Corporates	2,136	1,351	1,103	834	731	697	1,096	7,948
Retail	1	187	1,543	0	1,656	83	0	3,470
Other	2,681	652	587	1,020	558	898	468	6,866
Risk exposure amount for default funds contributions	185	1	0	0	121	0	0	308
Settlement Risk	36	0	0	0	0	0	0	36
Credit Valuation Adjustment (CVA)	8,846	39	43	139	252	90	8	9,416
Internal Model Approach	8,808	39	25	139	242	90	4	9,347
Standardized Approach	38	0	18	0	10	0	3	69
Market Risk	29,409	788	0	0	62	3,502	0	33,762
Internal Model Approach	25,595	788	0	0	0	2,780	0	29,163
Standardized Approach	3,814	0	0	0	62	722	0	4,599
Operational Risk	58,032	15,578	7,362	4,957	5,334	1,413	0	92,675
Advanced measurement approach	58,032	15,578	7,362	4,957	5,334	1,413	0	92,675
Total	157,612	79,403	43,565	8,854	42,209	9,079	15,512	356,235

Dec 31, 2015								
in € m.	Global Markets	Corporate & Investment Banking	Private, Wealth and Commercial Clients	Deutsche Asset Management	Postbank	Non-Core Operations Unit	Consolidation & Adjustments and Other	Total
Credit Risk	61,132	70,748	41,310	8,194	37,553	11,558	11,524	242,019
Segment reallocation	(93)	2,016	1,133	272	5	71	(3,404)	0
Advanced IRBA	53,512	63,054	36,009	6,243	30,177	7,424	13,805	210,223
Central Govern- ments and Central Banks	3,569	993	26	1	13	6	10,013	14,619
Institutions	7,744	3,948	111	78	1,293	342	633	14,149
Corporates	32,853	53,313	7,661	277	7,701	2,620	1,034	105,459
Retail	176	39	20,877	0	18,234	655	0	39,980
Other	9,170	4,761	7,334	5,888	2,937	3,801	2,125	36,016
Foundation IRBA	2,082	175	1	0	3,075	0	0	5,333
Central Govern- ments and Central Banks	0	0	0	0	0	0	0	0
Institutions	0	0	0	0	5	0	0	5
Corporates	2,082	175	1	0	3,070	0	0	5,329
Standardized Ap- proach	4,812	5,501	4,167	1,679	4,186	4,063	1,123	25,530
Central Govern- ments or Central Banks	14	30	3	0	144	0	10	202
Institutions	538	34	14	1	81	2	0	671
Corporates	2,268	3,713	946	715	918	736	587	9,884
Retail	6	239	2,499	0	1,763	512	0	5,018
Other	1,985	1,485	705	962	1,279	2,813	525	9,755
Risk exposure amount for default funds contributions	820	2	0	0	111	0	0	933
Settlement Risk	9	0	0	0	0	0	0	9
Credit Valuation Adjust- ment (CVA)	11,971	8	74	309	391	3,082	41	15,877
Internal Model Ap- proach	11,949	8	55	307	378	3,081	2	15,780
Standardized Ap- proach	22	0	19	2	14	1	40	97
Market Risk	32,502	1,191	6	1,262	32	14,286	275	49,553
Internal Model Ap- proach	27,643	1,032	6	367	0	8,741	275	38,063
Standardized Ap- proach	4,860	159	0	895	32	5,545	0	11,491
Operational Risk	54,777	14,165	8,518	2,739	5,266	3,972	487	89,923
Advanced measure- ment approach	54,777	14,165	8,518	2,739	5,266	3,972	487	89,923
Total	160,391	86,112	49,909	12,504	43,242	32,898	12,326	397,382

The RWA according to CRR/CRD 4 were €356.2 billion as of December 31, 2016, compared to €397.4 billion at the end of 2015. The overall decrease of €41.1 billion largely reflects decreases in credit and market risk RWA. Credit Risk RWA are €21.7 billion lower mainly resulting from the sales of our Hua Xia and Abbey Life stakes as well as from ongoing de-risking activities in the Non-Core Operations Unit and optimization initiatives in Corporate & Investment Banking, including securitizations, hold book reductions and client portfolio optimization. Lower exposures mainly in Corporate & Investment Banking and Global Markets also contributed to the decrease. The decrease in RWA for market risk since December 31, 2015 was primarily driven by a reduction in risk levels predominantly in the Non-Core Operations Unit and to lesser extent from lower levels of exposure in Global Markets. The €6.5 billion reduction in RWA for CVA was mainly driven by further de-risking of the portfolio and changes resulting from model refinements. The increase in Operational Risk RWA was mainly driven by large operational risk events which are reflected in our AMA model, such as settlements of regulatory matters by financial institutions partially offset by a slight decrease in GM.

RWA calculated on CRR/CRD 4 fully loaded basis were € 357.5 billion as of December 31, 2016 compared with € 396.7 billion at the end of 2015. The decrease was driven by the same movements as outlined for the transitional rules. The fully loaded RWA were € 1.3 billion higher than the risk-weighted assets under the transitional rules due to below explained application of the equity investment grandfathering rule Article 495 CRR.

Our portfolio of transactions, for which we will continue to apply the equity investment grandfathering rule until year end 2017, consisted of 15 transactions in 2016 amounting to € 220 million which will receive a 100 % risk weight instead of a risk weight between 190 % and 370 % determined based on Article 155 CRR in our CRR/CRD 4 fully loaded RWA number as we expect to sell the underlying assets by the end of 2017. We are closely monitoring the market and potential impacts from illiquid markets or other similar difficulties which could make it unfeasible to exit these positions.

The movements of RWA for the specific risk types are discussed in detail in the following sections starting with “Development of Risk-weighted Assets for Credit Risk”.

The table below shows RWA and regulatory capital requirements broken down by credit exposure classes and model approaches.

Regulatory Capital Requirements and Risk-weighted Assets

in € m.	Dec 31, 2016		Dec 31, 2015	
	Capital requirements	RWA	Capital requirements	RWA
Credit risk				
Advanced IRBA				
Central governments and central banks	1,395	17,436	1,170	14,619
Institutions	1,062	13,272	1,132	14,149
Corporates	8,031	100,392	8,437	105,459
thereof:				
SMEs	413	5,157	298	3,720
Specialized Lending	134	1,672	129	1,609
Other	7,485	93,562	8,010	100,129
Retail	3,305	41,317	3,198	39,980
thereof:				
Secured by real estate SME	89	1,112	146	1,825
Secured by real estate non-SME	1,863	23,283	1,907	23,842
Qualifying revolving	36	450	35	437
Other SME	136	1,700	123	1,537
Other non-SME	1,182	14,772	987	12,340
Equity	556	6,956	1,471	18,388
thereof:				
Private equity exposures sufficiently diversified (190 %)	18	228	21	261
Exchange-traded exposures (290 %)	36	444	24	302
All other equity exposures (370 %)	329	4,118	790	9,869
Significant financial sector investments subject to threshold exemptions (250 %)	173	2,165	637	7,957
Securitization positions	991	12,388	1,136	14,201
Of which IRB ratings-based approach (RBA)	239	2,986	597	7,467
Of which IRB Supervisory Formula Approach (SFA) ¹	752	9,403	539	6,734
Of which Internal assessment approach (IAA)	0	0	0	0
Other non-credit obligation assets	296	3,694	274	3,427
Total advanced IRBA	15,636	195,454	16,818	210,223
Foundation approach				
Central governments and central banks	0	0	0	0
Institutions	0	6	0	5
Corporates	457	5,710	426	5,329
thereof:				
SMEs	4	52	4	56
Specialized Lending	277	3,461	264	3,299
Other	176	2,196	158	1,974
Total foundation approach	457	5,716	427	5,333

in € m.	Dec 31, 2016		Dec 31, 2015	
	Capital requirements	RWA	Capital requirements	RWA
Standardized approach				
Central governments or central banks	0	1	0	0
Regional governments and local authorities	2	21	0	6
Public sector entities	4	53	16	196
Multilateral development banks	0	0	0	0
International organizations	0	0	0	0
Institutions	41	509	54	671
Corporates	636	7,948	791	9,884
thereof: SMEs	37	466	52	650
Retail	278	3,470	401	5,018
thereof: SMEs	10	124	13	163
Secured by mortgages on immovable property	98	1,221	180	2,252
thereof: SMEs	16	195	22	275
Exposures in default	161	2,011	276	3,446
Items associated with particular high risk	5	61	25	309
Covered bonds	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0
Equity (grandfathered positions)	85	1,057	117	1,466
Other items	82	1,028	65	810
Securitization positions	119	1,488	118	1,471
Total standardized approach	1,509	18,867	2,042	25,530
Risk exposure amount for default funds contributions	25	308	75	933
Total Credit risk	17,628	220,345	19,362	242,019
thereof:				
Counterparty credit risk	2,849	35,614	2,982	37,276
Of which Marked to market	794	9,928	534	6,674
Of which Original exposure	0	0	0	0
Of which internal model method (IMM)	2,055	25,686	2,448	30,602
Settlement risk	3	36	1	9
Credit Valuation Adjustment (CVA)				
Internal model approach	748	9,347	1,262	15,780
Standardized approach	6	69	8	97
Total Credit Valuation Adjustment	753	9,416	1,270	15,877
Market risk in the trading book				
Internal model approach	2,333	29,163	3,045	38,063
Value-at-Risk	477	5,957	554	6,931
Stressed Value-at-Risk	1,142	14,271	1,372	17,146
Incremental Risk Charge	693	8,662	929	11,608
Comprehensive Risk Measurement (Correlation Trading)	22	273	190	2,378
Standardized approach	368	4,599	919	11,491
Traded debt instruments	278	3,480	811	10,135
Equity risk	36	445	66	822
Foreign exchange risk	8	104	7	83
Commodity risk	0	0	0	0
Other market risk	46	570	36	451
Total market risk in the trading book	2,701	33,762	3,964	49,553
Operational risk				
Advanced measurement approach	7,414	92,675	7,194	89,923
Total regulatory capital requirements and RWA	28,499	356,235	31,791	397,382

¹ Including capital requirements for maturity mismatch of synthetic securitizations.

Leverage Ratio

We manage our balance sheet on a Group level and, where applicable, locally in each region. In the allocation of financial resources we favor business portfolios with the highest positive impact on our profitability and shareholder value. We monitor and analyze balance sheet developments and track certain market-observed balance sheet ratios. Based on this we trigger discussion and management action by the Group Risk Committee (GRC). Following the publication of the CRR/CRD 4 framework, we established a leverage ratio calculation according to that framework.

Leverage Ratio according to revised CRR/CRD 4 framework (fully loaded)

The CRR/CRD 4 framework introduced a non-risk based leverage ratio that is intended to act as a supplementary measure to the risk based capital requirements. Its objectives are to constrain the build-up of leverage in the banking sector, helping avoid destabilizing deleveraging processes which can damage the broader financial system and the economy, and to reinforce the risk based requirements with a simple, non-risk based “backstop” measure. While the CRR/CRD 4 framework currently does not provide for a mandatory minimum leverage ratio to be complied with by the relevant financial institutions, a legislative proposal published by the European Commission on November 23, 2016 suggests introducing a minimum leverage ratio of 3 %. The legislative proposal provides that the leverage ratio applies two years after the proposal’s entry into force and remains subject to political discussion among EU institutions.

We calculate our leverage ratio exposure on a fully loaded basis in accordance with Article 429 of the CRR as per Delegated Regulation (EU) 2015/62 of October 10, 2014 published in the Official Journal of the European Union on January 17, 2015 amending Regulation (EU) No 575/2013.

Our total leverage ratio exposure consists of the components 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 assets for cash variation margin provided in derivatives transactions are shown under derivative exposure in table leverage ratio common disclosure. 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 a purchased credit derivative on the same reference name provided certain conditions are met.

The SFT component includes the gross receivables for SFTs, which are netted with SFT payables if specific conditions are met. In addition to the gross exposure a regulatory add-on for the counterparty credit risk is included.

The off-balance sheet exposure component follows the credit risk conversion factors (CCF) of the standardized approach for credit risk (0 %, 20 %, 50 %, or 100 %), which depend on the risk category subject to a floor of 10 %.

The other on-balance sheet exposure component (excluding derivatives and SFTs) reflects the accounting values of the assets (excluding derivatives and SFTs) as well as regulatory adjustments for asset amounts deducted in determining Tier 1 capital.

The following tables show the leverage ratio exposure and the leverage ratio, both on a fully loaded basis, on the disclosure tables of the implementing technical standards (ITS) which were adopted by the European Commission via Commission Implementing Regulation (EU) 2016/200 published in the Official Journal of the European Union on February 16, 2016:

Summary reconciliation of accounting assets and leverage ratio exposures

in €bn.

(unless stated otherwise)

	Dec 31, 2016	Dec 31, 2015
Total assets as per published financial statements	1,591	1,629
Adjustment for entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation	0	3
(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	(276)	(263)
Adjustment for securities financing transactions (SFTs)	20	25
Adjustment for off-balance sheet items (i.e. conversion to credit equivalent amounts of off-balance sheet exposures)	102	109
(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	(90)	(107)
Leverage ratio total exposure measure	1,348	1,395

N/M – Not meaningful

Leverage ratio common disclosure

in € bn.

(unless stated otherwise)

	Dec 31, 2016	Dec 31, 2015
On-balance sheet exposures (excluding derivatives and SFTs)		
On-balance sheet items (excluding derivatives, SFTs and fiduciary assets, but including collateral)	948	924
(Asset amounts deducted in determining Tier 1 capital)	(15)	(17)
Total on-balance sheet exposures (excluding derivatives, SFTs and fiduciary assets)	933	907
Derivative exposures		
Replacement cost associated with all derivatives transactions (i.e. net of eligible cash variation margin)	53	59
Add-on amounts for PFE associated with all derivatives transactions (mark-to-market method)	154	174
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)	(37)	(40)
(Exempted CCP leg of client-cleared trade exposures)	(10)	(8)
Adjusted effective notional amount of written credit derivatives	750	668
(Adjusted effective notional offsets and add-on deductions for written credit derivatives)	(733)	(637)
Total derivatives exposures	177	215
SFT exposures		
Gross SFT assets (with no recognition of netting), after adjusting for sales accounting transactions	159	183
(Netted amounts of cash payables and cash receivables of gross SFT assets)	(42)	(35)
Counterparty credit risk exposure for SFT assets	18	16
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	0	0
(Exempted CCP leg of client-cleared SFT exposure)	0	0
Total securities financing transaction exposures	135	164
Other off-balance sheet exposures		
Off-balance sheet exposures at gross notional amount	277	278
(Adjustments for conversion to credit equivalent amounts)	(174)	(169)
Other off-balance sheet exposures	102	109
Exempted exposures in accordance with Article 429(7) and (14) of Regulation (EU) No 575/2013 (on and off balance sheet)		
(Intragroup exposures (solo basis) exempted in accordance with Article 429(7) of Regulation (EU) No 575/2013 (on and off balance sheet))	N/M	N/M
(Exposures exempted in accordance with Article 429 (14) of Regulation (EU) No 575/2013 (on and off balance sheet))	N/M	N/M
Capital and total exposure measure		
Tier 1 capital fully loaded	46.8	48.7
Leverage ratio total exposure measure	1,348	1,395
Leverage ratio in % (CRR/CRD 4 fully loaded Leverage Ratio - using a CRR/CRD 4 fully loaded definition of Tier 1 capital)	3.5	3.5

N/M – Not meaningful

Breakdown of on-balance sheet exposures (excluding derivatives and SFTs)

in € bn.

(unless stated otherwise)

	Dec 31, 2016	Dec 31, 2015
Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures)	948	924
of which:		
Trading book exposures ¹	225	251
Banking book exposures	723	673
of which:		
Covered bonds	2	3
Exposures treated as sovereigns	259	186
Exposures to regional governments, MDB, international organizations and PSE not treated as sovereigns	2	4
Institutions	16	11
Secured by mortgages of immovable properties	164	163
Retail exposures	35	36
Corporate	179	175
Exposures in default	9	7
Other exposures (e.g. equity, securitizations, and other non-credit obligation assets)	57	87

¹ Excluding deductions of receivables assets for cash variation margin provided in derivatives transactions which are shown under derivative exposure in table leverage ratio common disclosure. Amount of comparison period aligned to reflect this.

Description of the process used to manage the risk of excessive leverage

As described in the section “Risk Management Principles” of this report, the Group Risk Committee (GRC) is mandated to oversee, control and monitor integrated planning our risk profile and capital capacity. The GRC actively manages leverage exposure capacity 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 in our Financial Report.

Description of the factors that had an impact on the leverage ratio in 2016

As of December 31, 2016, our fully loaded CRR/CRD 4 leverage ratio was 3.5 % compared to 3.5 % as of December 31, 2015, taking into account as of December 31, 2016 a fully loaded Tier 1 capital of €46.8 billion over an applicable exposure measure of €1,348 billion (€48.7 billion and €1,395 billion as of December 31, 2015, respectively).

Our CRR/CRD 4 leverage ratio according to transitional provisions was 4.1 % as of December 31, 2016, calculated as Tier 1 capital according to transitional rules of €55.5 billion over an applicable exposure measure of €1,350 billion. The exposure measure under transitional rules is €2 billion higher compared to the fully loaded exposure measure as the asset amounts deducted in determining Tier 1 capital are lower under transitional rules.

Over the year 2016, our leverage ratio exposure decreased by €48 billion to €1,348 billion. This principally reflects a decrease in derivative exposures of €38 billion primarily related to lower add-ons for potential future exposure and effective notional amounts of written credit derivatives after offsetting. Furthermore, there was a decrease of €29 billion in SFT exposures reflecting the overall decrease on the balance sheet in the SFT related items (securities purchased under resale agreements and securities borrowed, under both accrual and fair value accounting, and receivables from prime brokerage). In addition, off-balance sheet exposures decreased by €7 billion corresponding to lower notional amounts for irrevocable lending commitments and contingent liabilities. The mentioned decreases in leverage ratio exposure are partly offset by an increase of €25 billion in other assets, principally from higher cash and central bank balances on our balance sheet partly offset by reductions on our balance sheet in non-derivative trading assets, loans and financial assets available for sale.

The decrease of the leverage ratio exposure in 2016 includes foreign exchange impacts of €11 billion mainly due to the depreciation of the euro against the U.S. dollar which was partly offset by its appreciation against the pound sterling.

Our leverage ratio calculated as the ratio of total assets under IFRS to total equity under IFRS was 25 as of December 31, 2016 compared to 24 as of December 31, 2015.

For main drivers of the Tier 1 capital development please refer to section “Regulatory Capital” in this report.

Credit Risk Exposure

Credit Risk: Regulatory Assessment

This section details our credit risk performance, focusing on regulatory measures such as exposure at default (EAD) and RWA. The credit risk exposure is analyzed by business division, country and industry concentrations, residual maturities, probabilities of default and actual losses.

Credit risk exposure by model approaches and business divisions

The following table provides an overview of our credit risk exposure broken down by model approaches and business divisions.

The line item "Other" in Advanced IRBA reflects exposure at default from securitization positions in the banking book, specific equity positions and other non-credit obligation assets. Within the Standardized 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 item "Other" in the Standardized Approach includes EAD from exposures secured by mortgages on immovable property, exposures in default, items associated with particular high risk, covered bonds, claims on institutions and corporates with a short-term credit assessment, collective investments undertakings (CIU), equity positions (grandfathered), securitization positions in the banking book and other items.

EAD net by model approach and business division

	Dec 31, 2016							
in €m.	Global Markets	Corporate & Investment Banking	Private, Wealth and Commercial Clients	Deutsche Asset Management	Postbank	Non-Core Operations Unit	Consolidation & Adjustments and Other	Total
Credit Risk								
Advanced IRBA	246,835	235,023	186,010	1,833	107,731	2,804	26,346	806,583
Central governments and central banks								
Institutions	42,727	67,759	10,626	43	1,113	4	20,023	142,294
Corporates	41,622	15,846	1,023	459	4,142	188	2,429	65,709
Retail	129,902	108,485	57,195	563	15,114	1,097	1,987	314,343
Other	875	112	115,657	0	84,236	770	0	201,650
Other	31,710	42,822	1,510	768	3,127	745	1,906	82,587
Foundation IRBA	2,488	242	0	0	8,429	0	0	11,161
Central governments and central banks								
Institutions	0	0	0	0	0	0	0	0
Corporates	0	0	0	0	2	0	0	2
Other	2,488	242	0	0	8,427	0	0	11,158
Standardized Approach	82,426	45,754	19,854	1,783	32,395	2,373	7,307	191,892
Central governments or central banks								
Institutions	53,980	42,899	14,734	6	26,652	302	4,009	142,582
Corporates	19,844	58	41	0	1,445	32	1,115	22,534
Retail	5,020	1,551	1,814	756	766	729	1,096	11,732
Other	1	306	2,085	0	2,219	110	0	4,722
Other	3,582	939	1,180	1,020	1,314	1,200	1,086	10,322
Risk exposure amount for default funds contributions	342	1	0	0	80	0	0	423
Total	332,092	281,020	205,865	3,616	148,635	5,178	33,653	1,010,058

Dec 31, 2015

in € m.	Global Markets	Corporate & Investment Banking	Private, Wealth and Commercial Clients	Deutsche Asset Management	Postbank	Non-Core Operations Unit	Consolidation & Adjustments and Other	Total
Credit Risk								
Advanced IRBA	242,819	190,576	185,156	2,928	107,254	11,702	19,211	759,647
Central governments and								
central banks	60,812	19,666	2,966	15	719	292	15,339	99,809
Institutions	36,118	13,107	954	490	8,793	626	1,346	61,435
Corporates	112,960	119,212	60,417	553	14,480	5,589	1,015	314,225
Retail	1,284	121	116,669	0	80,378	1,050	0	199,502
Other	31,644	38,470	4,151	1,870	2,884	4,146	1,510	84,676
Foundation IRBA	2,531	223	2	0	7,964	1	0	10,720
Central governments and								
central banks	0	0	0	0	0	0	0	0
Institutions	0	0	0	0	2	0	0	2
Corporates	2,531	223	2	0	7,962	1	0	10,718
Standardized Approach	114,572	14,242	6,467	1,940	28,826	6,647	3,979	176,673
Central governments or								
central banks	81,245	7,126	674	245	20,078	2,321	2,343	114,032
Institutions	24,946	204	39	4	2,372	11	450	28,026
Corporates	5,334	4,120	1,185	728	923	873	587	13,751
Retail	7	395	3,420	0	2,359	683	0	6,864
Other	3,040	2,397	1,149	962	3,093	2,759	598	13,999
Risk exposure amount for default funds contribu- tions	485	1	0	0	56	1	0	543
Total	360,406	205,042	191,626	4,868	144,100	18,351	23,190	947,582

The overall EAD increased in 2016 by €62.5 billion to €1,010 billion and is mainly driven by higher positions in interest earning deposits with central banks in the advanced internal rating based as well as in the standardized approach reflecting the result of the ongoing optimization of the Group's Strategic Liquidity Reserve. Furthermore a change in netting treatment for a selected portfolio set in our securities financing transaction business contributed to the increase. This is partly offset by ongoing de-risking initiatives in NCOU. In addition shifts across core business divisions in the exposure classes "central governments and banks" and "corporates" reflect the impact of the business reorganization in the beginning of 2016.

The table below shows the credit risk exposures before credit risk mitigation, the average amount of the exposures and RWA broken down by model approach and regulatory exposure class. The EAD as defined for regulatory purposes is presented on a gross basis, i.e. information for exposures covered by guarantees or credit derivatives is assigned to the exposure class of the original counterparty. The average EAD is calculated over the last four quarters of this fiscal year. In contrast to the EAD gross the RWA is shown after credit risk mitigation.

EAD gross, average EAD gross and RWA by model approach and exposure class

in € m.	Dec 31, 2016			Dec 31, 2015		
	EAD gross	Average EAD gross	RWA	EAD gross	Average EAD gross	RWA
Advanced IRBA						
Central governments and central banks	134,368	105,407	17,436	93,253	90,237	14,619
Institutions	61,056	57,152	13,272	59,745	64,020	14,149
Corporates	327,795	334,100	100,392	323,491	335,053	105,459
thereof:						
SMEs	12,629	11,787	5,157	10,092	9,095	3,720
Specialized Lending	6,376	5,901	1,672	5,363	5,452	1,609
Other	308,789	316,412	93,562	308,036	320,505	100,129
Retail	200,686	200,093	41,317	198,333	196,987	39,980
thereof:						
Secured by real estate SME	9,546	12,456	1,112	13,542	13,816	1,825
Secured by real estate non-SME	152,590	149,672	23,283	147,093	145,753	23,842
Qualifying revolving	4,040	4,104	450	4,194	4,319	437
Other SME	5,992	6,825	1,700	7,405	7,406	1,537
Other non-SME	28,518	27,035	14,772	26,099	25,693	12,340
Equity	2,252	4,903	6,956	6,091	5,133	18,388
thereof:						
Private equity exposures sufficiently diversified (190 %)	120	139	228	137	105	261
Exchange-traded exposures (290 %)	153	307	444	104	94	302
Other equity exposures (370 %)	1,113	1,920	4,118	2,667	1,534	9,869
Significant financial sector investments subject to threshold exemptions (250 %)	866	2,536	2,165	3,183	3,401	7,957
Securitization positions	74,047	71,429	12,388	73,036	68,405	14,201
Other non-credit obligation assets	6,287	5,020	3,694	5,552	8,594	3,427
Total advanced IRBA	806,491	778,103	195,454	759,501	768,428	210,223
Foundation approach						
Central governments and central banks	0	0	0	0	0	0
Institutions	2	2	6	2	22	5
Corporates	11,267	11,842	5,710	10,864	10,569	5,329
thereof:						
SMEs	227	199	52	247	251	56
Specialized Lending	4,485	4,489	3,461	4,451	4,565	3,299
Other	6,555	7,154	2,196	6,167	5,753	1,974
Total foundation approach	11,269	11,844	5,716	10,866	10,591	5,333
Standardized approach						
Central governments or central banks	112,836	96,065	1	71,726	54,586	0
Regional governments or local authorities	14,111	16,817	21	18,639	18,860	6
Public sector entities	7,687	10,468	53	12,387	12,538	196
Multilateral development banks	6,331	7,500	0	7,111	6,647	0
International organizations	1,595	2,801	0	3,609	3,413	0
Institutions	22,526	27,522	509	27,982	31,480	671
Corporates	11,734	12,894	7,948	13,989	19,852	9,884
thereof: SMEs	555	638	466	752	1,004	650
Retail	4,718	5,897	3,470	7,179	7,600	5,018
thereof: SMEs	233	256	124	316	435	163
Secured by mortgages on immovable property	3,312	3,931	1,221	5,837	5,442	2,252
thereof: SMEs	451	600	195	636	519	275
Exposures in default	1,544	2,677	2,011	2,853	3,164	3,446
Items associated with particular high risk	46	154	61	213	233	309
Covered bonds	0	0	0	0	11	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	10,146	0
Equity	1,057	1,244	1,057	1,541	2,454	1,466
Other items	1,791	2,814	1,028	884	465	810
Securitization positions	2,588	2,486	1,488	2,724	2,101	1,471
Total standardized approach	191,875	193,269	18,867	176,673	178,992	25,530
Risk exposure amount for default funds contributions	423	623	308	543	1,108	933
Total	1,010,058	983,839	220,345	947,582	959,119	242,019
thereof counterparty credit risk from						
Derivatives	98,273	105,652	30,601	104,912	118,385	33,788
Securities financing transactions	68,451	65,562	5,012	50,254	52,058	3,488

The overall increase in Average EAD is primarily attributable to the optimization of the Group's Strategic Liquidity Reserve reflecting higher averages especially in exposure classes of "central governments or central banks" across all approaches.

The following three tables set out the distribution of the credit risk portfolio by model approach and regulatory exposure class before credit risk mitigation into geographical region, industry and residual maturity.

EAD gross by model approach, exposure class and geographical region

Dec 31, 2016

in € m.	Germany	Western Europe (excluding Germany)	Eastern Europe	North America	Central and South America	Asia/Pacific	Africa	Other	Total
Advanced IRBA									
Central governments and central banks	1,219	3,834	4,532	100,257	1,519	19,145	591	3,271	134,368
Institutions	5,205	20,230	328	18,736	1,226	13,799	142	1,390	61,056
Corporates	41,199	90,012	4,056	115,945	5,739	42,981	2,226	25,637	327,795
thereof:									
SMEs	5,769	4,061	399	752	84	961	15	587	12,629
Specialized Lending	2,993	2,959	154	237	0	34	0	0	6,376
Other	32,437	82,992	3,503	114,956	5,655	41,986	2,210	25,049	308,789
Retail	165,493	28,947	5,739	102	103	124	107	72	200,686
thereof:									
Secured by real estate SME	8,821	708	12	1	1	2	0	1	9,546
Secured by real estate non-SME	129,866	17,418	5,072	74	17	79	14	50	152,590
Qualifying revolving	3,928	85	5	5	5	7	2	4	4,040
Other SME	3,223	2,523	234	5	2	5	0	0	5,993
Other non-SME	19,655	8,212	416	18	78	32	90	17	28,517
Equity	684	164	0	518	3	687	4	190	2,252
thereof:									
Private equity exposures sufficiently diversified (190 %)	0	0	0	120	0	0	0	0	120
Exchange-traded exposures (290 %)	0	18	0	35	0	65	4	32	153
Other equity exposures (370 %)	491	109	0	346	2	47	0	117	1,114
Significant financial sector investments subject to threshold exemptions (250 %)	193	37	0	17	1	575	0	41	865
Securitization positions	7,149	17,723	52	42,481	1,166	4,395	91	992	74,048
Other non-credit obligation assets	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	6,287
Total advanced IRBA	220,948	160,909	14,707	278,040	9,756	81,131	3,160	31,553	806,491
Foundation approach									
Central governments and central banks	0	0	0	0	0	0	0	0	0
Institutions	2	0	0	0	0	0	0	0	2
Corporates	6,759	2,424	264	1,053	69	150	28	520	11,267
thereof:									
SMEs	181	30	5	4	1	5	0	0	227
Specialized Lending	1,571	1,175	105	997	0	94	23	520	4,485
Other	5,006	1,219	154	52	68	51	4	0	6,555
Total foundation approach	6,761	2,424	264	1,053	69	150	28	520	11,269

									Dec 31, 2016
in € m.	Germany	Western Europe (excluding Germany)	Eastern Europe	North America	Central and South America	Asia/ Pacific	Africa	Other	Total
Standardized approach									
Central governments or central banks	65,160	47,526	120	6	0	0	0	23	112,836
Regional governments or local authorities	13,778	333	0	0	0	0	0	0	14,111
Public sector entities	7,471	201	0	15	0	0	0	0	7,687
Multilateral development banks	0	492	0	0	0	0	0	5,839	6,331
International organizations	0	0	0	0	0	0	0	1,595	1,595
Institutions	1,923	7,744	0	8,803	507	3,548	0	0	22,525
Corporates	3,142	3,709	116	3,414	96	887	110	259	11,734
thereof: SMEs	129	380	0	0	0	45	0	0	554
Retail	2,154	1,227	466	2	0	869	0	1	4,719
thereof: SMEs	49	184	0	0	0	0	0	0	233
Secured by mortgages on immovable property	230	2,389	6	2	0	685	0	0	3,312
thereof: SMEs	32	418	0	0	0	0	0	0	450
Exposures in default	261	1,021	37	21	6	180	5	11	1,543
Items associated with particular high risk	0	32	9	0	0	4	0	0	46
Covered bonds	0	0	0	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	0	0	0	0	0
Equity	165	219	0	466	0	41	0	165	1,057
Other items	812	979	0	0	0	0	0	0	1,791
Securitization positions	0	613	0	1,973	0	0	0	2	2,588
Total standardized approach	95,097	66,486	754	14,703	609	6,215	116	7,896	191,875
Risk exposure amount for default funds contributions	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	423
Total	322,807	229,819	15,725	293,796	10,434	87,495	3,303	39,969	1,010,058
Thereof counterparty credit risk from									
Derivatives	7,167	42,966	557	32,985	1,156	10,569	406	2,466	98,273
Securities financing transactions	938	12,784	86	24,194	1,567	11,568	222	17,090	68,451

N/M – Not meaningful

Dec 31, 2015

in € m.	Germany	Western Europe (excluding Germany)	Eastern Europe	North America	Central and South America	Asia/Pacific	Africa	Other	Total
Advanced IRBA									
Central governments and central banks	1,171	11,917	4,127	52,817	1,292	16,719	918	4,292	93,253
Institutions	5,774	20,831	751	14,654	1,458	14,989	295	992	59,745
Corporates	40,404	88,798	4,430	121,763	7,539	43,884	2,637	14,036	323,491
thereof:									
SMEs	4,644	3,008	318	1,641	237	218	4	23	10,093
Specialized Lending	2,801	2,085	127	284	0	66	0	0	5,363
Other	32,959	83,707	3,984	119,837	7,302	43,600	2,633	14,013	308,036
Retail	165,113	26,569	6,026	117	157	130	119	103	198,333
thereof:									
Secured by real estate SME	12,646	885	7	2	1	0	0	1	13,542
Secured by real estate non-SME	124,973	16,502	5,357	83	25	79	16	58	147,093
Qualifying revolving	4,131	35	5	5	5	7	2	4	4,194
Other SME	4,354	2,805	244	2	0	1	0	1	7,405
Other non-SME	18,986	6,366	413	26	125	43	101	40	26,099
Equity	704	1,637	0	498	1	3,024	2	226	6,091
thereof:									
Private equity exposures sufficiently diversified (190 %)	9	80	0	35	0	0	0	13	137
Exchange-traded exposures (290 %)	0	36	0	43	0	16	2	7	104
Other equity exposures (370 %)	559	1,492	0	406	0	36	0	174	2,667
Significant financial sector investments subject to threshold exemptions (250 %)	136	28	0	14	1	2,971	0	33	3,183
Securitization positions	4,988	19,043	486	40,901	1,263	5,022	1,325	8	73,036
Other non-credit obligation assets	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	5,552
Total advanced IRBA	218,154	168,796	15,819	230,751	11,710	83,767	5,295	19,657	759,501
Foundation approach									
Central governments and central banks	0	0	0	0	0	0	0	0	0
Institutions	2	0	0	0	0	0	0	0	2
Corporates	6,384	2,565	223	893	74	145	6	574	10,864
thereof:									
SMEs	208	35	2	0	1	1	0	0	247
Specialized Lending	1,562	1,270	111	820	17	97	0	574	4,451
Other	4,614	1,260	110	73	56	47	6	0	6,166
Total foundation approach	6,386	2,565	223	893	74	145	6	574	10,866

									Dec 31, 2015
in € m.	Germany	Western Europe (excluding Germany)	Eastern Europe	North America	Central and South America	Asia/Pacific	Africa	Other	Total
Standardized approach									
Central governments or central banks	27,662	43,973	71	0	0	0	0	20	71,726
Regional governments or local authorities	18,317	322	0	0	0	0	0	0	18,639
Public sector entities	11,645	742	0	0	0	0	0	0	12,387
Multilateral development banks	0	802	0	0	0	0	0	6,309	7,111
International organizations	0	0	0	0	0	0	0	3,609	3,609
Institutions	4,946	8,296	0	11,346	248	3,146	0	0	27,982
Corporates	2,836	6,584	125	2,692	369	765	131	486	13,989
thereof: SMEs	117	618	2	0	2	13	0	0	752
Retail	2,286	3,678	416	16	10	751	7	15	7,179
thereof: SMEs	36	278	2	0	0	0	0	0	316
Secured by mortgages on immovable property	291	4,910	58	101	0	476	0	0	5,837
thereof: SMEs	7	622	6	0	0	0	0	0	636
Exposures in default	353	1,476	11	749	23	209	14	19	2,853
Items associated with particular high risk	1	199	11	0	1	1	0	0	213
Covered bonds	0	0	0	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	0	0	0	0	0
Equity	204	208	0	764	0	66	0	299	1,541
Other items	93	791	0	0	0	0	0	0	884
Securitization positions	0	982	0	1,742	0	0	0	0	2,724
Total standardized approach	68,633	72,964	693	17,411	650	5,414	153	10,756	176,673
Risk exposure amount for default funds contributions	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	543
Total	293,173	244,325	16,734	249,054	12,434	89,326	5,454	30,988	947,582
Thereof counterparty credit risk from									
Derivatives	10,531	41,337	1,051	36,970	2,000	10,041	492	2,491	104,912
Securities financing transactions	387	14,547	90	22,614	1,157	8,405	282	2,772	50,254

N/M – Not meaningful

The increase in the exposure class “Central governments and central banks” in North America and Western Europe is predominantly driven by higher interest earning deposits with central banks. The reduction in the exposure class “Corporates” in North America represents de-risking activities in this region. The reductions in A-IRB Equity positions in Western Europe (excluding Germany) and Asia / Pacific reflect the sales of our Abbey Life and Hua Xia stakes. The increase in the exposure class “Central governments or central banks” in Germany is driven by higher interest earning deposits with the central bank.

EAD gross by model approach, exposure class and industry

Dec 31, 2016

in € m.	Financial inter-mediation	Fund management activities	Manufacturing	Wholesale and retail trade	Households	Commercial real estate activities	Public sector	Other	Total
Advanced IRBA									
Central governments and central banks	100,844	0	0	0	0	0	33,524	0	134,368
Institutions	57,865	0	48	6	0	66	3,071	0	61,056
Corporates	112,317	8,087	47,980	20,980	23,984	33,051	2,548	78,848	327,795
thereof:									
SMEs	2,058	82	2,225	2,150	356	3,259	7	2,492	12,629
Specialized Lending	0	0	0	0	0	6,375	0	1	6,376
Other	110,259	8,005	45,754	18,829	23,628	23,417	2,541	76,355	308,789
Retail	489	584	2,115	2,891	178,999	11,461	2	4,144	200,686
thereof:									
Secured by real estate SME	285	161	339	661	2,566	5,534	0	0	9,546
Secured by real estate non-SME	94	61	304	448	146,224	5,457	0	0	152,590
Qualifying revolving	0	0	0	0	4,040	0	0	0	4,040
Other SME	46	24	1,158	1,359	642	242	0	2,521	5,993
Other non-SME	64	338	313	423	25,528	228	0	1,623	28,517
Equity	230	25	28	14	0	156	5	1,794	2,252
thereof:									
Private equity exposures sufficiently diversified (190 %)	0	0	0	0	0	0	0	120	120
Exchange-traded exposures (290 %)	68	0	7	0	0	0	0	78	153
Other equity exposures (370 %)	162	25	21	14	0	156	5	730	1,114
Significant financial sector investments subject to threshold exemptions (250 %)	0	0	0	0	0	0	0	866	866
Securitization positions	10,812	15,948	947	62	0	761	0	45,518	74,048
Other non-credit obligation assets	739	2	85	85	0	10	0	5,366	6,287
Total advanced IRBA	283,296	24,647	51,202	24,038	202,983	45,505	39,149	135,671	806,491
Foundation approach									
Central governments and central banks	0	0	0	0	0	0	0	0	0
Institutions	2	0	0	0	0	0	0	0	2
Corporates	447	0	2,701	3,645	288	1,252	0	2,935	11,267
thereof:									
SMEs	0	0	20	205	0	0	0	1	227
Specialized Lending	69	0	301	7	287	1,244	0	2,578	4,485
Other	377	0	2,380	3,433	1	7	0	356	6,555
Total foundation approach	449	0	2,701	3,645	288	1,252	0	2,935	11,269

	Dec 31, 2016								
in € m.	Financial interme- diation	Fund manage- ment activities	Manu- facturing	Whole- sale and retailtrade	House- holds	Com- mercial real estate activities	Public sector	Other	Total
Standardized approach									
Central governments and central banks	83,942	0	0	0	0	0	28,894	0	112,836
Regional governments or local authorities	0	0	0	0	0	32	14,079	0	14,111
Public sector entities	7,416	0	0	49	0	0	185	37	7,687
Multilateral development banks	6,331	0	0	0	0	0	0	0	6,331
International organizations	0	0	0	0	0	0	1,595	0	1,595
Institutions	22,526	0	0	1	0	0	0	0	22,526
Corporates	3,565	319	557	724	426	551	0	5,591	11,734
thereof: SMEs	97	1	116	96	30	65	0	150	555
Retail	9	4	53	69	3,755	508	0	320	4,718
thereof: SMEs	4	1	15	37	49	11	0	115	233
Secured by mortgages on immovable property	39	1	48	97	2,029	851	0	246	3,312
thereof: SMEs	39	1	46	91	6	111	0	157	451
Exposures in default	361	13	138	53	297	484	7	192	1,543
Items associated with particular high risk	0	0	0	1	44	0	0	1	46
Covered bonds	0	0	0	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	0	0	0	0	0
Equity	607	0	9	14	0	2	0	424	1,057
Other items	178	0	0	0	0	0	0	1,613	1,791
Securitization positions	500	1,897	0	0	0	0	0	191	2,588
Total standardized approach	125,473	2,234	805	1,007	6,551	2,429	44,760	8,616	191,875
Risk exposure amount for default funds contributions	423	0	0	0	0	0	0	0	423
Total	409,640	26,881	54,708	28,690	209,822	49,185	83,909	147,222	1,010,058
Thereof counterparty credit risk from									
Derivatives	62,560	3,916	4,592	939	1,134	2,115	7,710	15,306	98,273
Securities financing transactions	67,686	25	0	0	0	7	537	195	68,451

N/M – Not meaningful

Dec 31, 2015¹

in € m.	Financial interme- diation	Fund manage- ment activities	Manu- facturing	Whole- sale and retailtrade	House- holds	Com- mer- cial real estate activities	Public sector	Other	Total
Advanced IRBA									
Central governments and central banks	61,820	0	0	0	0	0	31,432	0	93,253
Institutions	56,376	21	0	268	0	25	3,050	4	59,745
Corporates	105,271	9,488	48,448	21,821	35,215	24,350	2,112	76,786	323,491
thereof:									
SMEs	1,562	107	1,816	1,564	672	2,544	197	1,630	10,092
Specialized Lending	0	0	0	0	0	5,359	0	4	5,363
Other	103,710	9,382	46,631	20,256	34,543	16,446	1,915	75,152	308,036
Retail	485	721	2,836	3,405	174,728	3,692	3	12,463	198,333
thereof:									
Secured by real estate SME	296	168	464	767	5,787	2,086	0	3,974	13,542
Secured by real estate non-SME	92	66	341	471	140,976	1,224	1	3,921	147,093
Qualifying revolving	0	0	0	0	4,194	0	0	0	4,194
Other SME	49	27	1,689	1,706	779	208	1	2,946	7,405
Other non-SME	48	459	341	461	22,992	175	0	1,622	26,099
Equity	1,740	45	2	52	0	172	3	4,078	6,091
thereof:									
Private equity exposures sufficiently diversified (190 %)	55	16	0	0	0	0	0	66	137
Exchange-traded exposures (290 %)	73	0	2	0	0	0	3	26	104
Other equity exposures (370 %)	1,612	28	0	52	0	172	0	803	2,667
Significant financial sector investments subject to threshold exemptions (250 %)	0	0	0	1	0	0	0	3,183	3,184
Securitization positions	13,001	19,142	0	0	0	706	0	40,186	73,036
Other non-credit obligation assets	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	5,552
Total advanced IRBA	238,695	29,417	51,286	25,546	209,943	28,945	36,600	133,517	759,500
Foundation approach									
Central governments and central banks	0	0	0	0	0	0	0	0	0
Institutions	0	0	0	0	0	0	2	0	2
Corporates	236	0	2,468	3,718	304	1,116	1	3,022	10,864
thereof:									
SMEs	0	0	90	148	0	3	0	6	247
Specialized Lending	72	0	307	9	303	1,109	0	2,651	4,451
Other	164	0	2,071	3,521	1	44	1	365	6,167
Total foundation approach	236	0	2,468	3,718	304	1,116	3	3,022	10,866

	Dec 31, 2015 ¹								
in € m.	Financial inter-mediation	Fund manage-ment activities	Manu-facturing	Whole-sale and retailtrade	House-holds	Com-mercial real estate activities	Public sector	Other	Total
Standardized approach									
Central governments and central banks	36,351	0	0	0	0	0	35,375	0	71,726
Regional governments or local authorities	0	0	0	0	0	41	18,598	0	18,639
Public sector entities	11,421	0	0	44	0	0	879	43	12,387
Multilateral development banks	7,111	0	0	0	0	0	0	0	7,111
International organizations	0	0	0	0	0	0	3,609	0	3,609
Institutions	27,811	35	0	0	0	0	0	136	27,982
Corporates	4,244	466	1,148	1,733	277	(63)	50	6,134	13,989
thereof: SMEs	37	16	100	147	11	168	0	273	752
Retail	8	0	61	101	6,261	431	0	316	7,179
thereof: SMEs	6	0	28	68	38	76	0	100	316
Secured by mortgages on immovable property	212	39	180	257	3,479	1,156	0	513	5,837
thereof: SMEs	37	32	80	164	5	12	0	306	636
Exposures in default	102	119	192	101	695	508	6	1,130	2,853
Items associated with particular high risk	0	0	1	6	115	1	79	11	213
Covered bonds	0	0	0	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	0	0	0	0	0
Equity	667	0	30	14	0	75	15	741	1,541
Other items	93	0	0	0	0	0	0	791	884
Securitization positions	534	1,704	0	0	302	0	0	184	2,724
Total standardized approach	88,554	2,362	1,612	2,256	11,128	2,149	58,611	10,000	176,673
Risk exposure amount for default funds contributions	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	543
Total	327,485	31,779	55,366	31,521	221,375	32,210	95,214	146,538	947,582
Thereof counterparty credit risk from									
Derivatives	70,514	4,318	4,577	1,670	1,125	2,501	9,022	11,184	104,912
Securities financing transactions	45,151	97	6	4	100	2	4,169	725	50,254

N/M – Not meaningful

¹ Comparatives have been restated to reflect changes in industry sectors.

The increase in the industry class “Financial intermediation” as well as an overall increase in exposure class “Central governments and central banks” reflects higher positions in interest earning deposits with central banks. The movements in the exposure class “Corporates” in the advanced IRBA across the industry sectors reflect refinements in the allocations. The reductions in the exposure class “Equity” for financial intermediation and “Other” result from the sale of our Abbey Life and Hua Xia stakes.

EAD gross by model approach, exposure class and residual maturity

Dec 31, 2016

in € m.	Up to one month	Over 1 month to not more than 1 year	Over 1 year to not more than 2 years	Over 2 years to not more than 5 years	Over 5 years	Total
Advanced IRBA						
Central governments and central banks	93,683	11,028	3,671	21,625	4,362	134,368
Institutions	18,391	17,868	8,430	16,367	0	61,056
Corporates	51,431	100,956	41,618	131,103	2,686	327,795
thereof:						
SMEs	1,996	2,774	1,005	6,689	165	12,629
Specialized Lending	244	661	635	2,972	1,864	6,376
Other	49,190	97,521	39,977	121,442	657	308,789
Retail	9,646	5,893	4,107	15,597	165,442	200,686
thereof:						
Secured by real estate SME	80	105	144	640	8,577	9,546
Secured by real estate non-SME	1,541	2,640	2,360	6,621	139,429	152,590
Qualifying revolving	3,835	205	0	0	0	4,040
Other SME	1,916	1,065	299	1,265	1,446	5,993
Other non-SME	2,273	1,882	1,305	7,070	15,990	28,517
Equity	0	36	0	1,971	244	2,252
thereof:						
Private equity exposures sufficiently diversified (190 %)	0	0	0	120	0	120
Exchange-traded exposures (290 %)	0	0	0	153	0	153
Other equity exposures (370 %)	0	28	0	1,022	63	1,114
Significant financial sector investments subject to threshold exemptions (250 %)	0	8	0	676	181	865
Securitization positions	72	4,901	3,127	23,621	42,325	74,048
Other non-credit obligation assets	N/M	N/M	N/M	N/M	N/M	6,287
Total advanced IRBA	173,224	140,681	60,954	210,284	215,059	806,491
Foundation approach						
Central governments and central banks	0	0	0	0	0	0
Institutions	0	0	0	0	2	2
Corporates	351	509	304	3,786	6,316	11,267
thereof:						
SMEs	2	2	2	1	220	227
Specialized Lending	167	125	192	2,934	1,066	4,485
Other	182	383	109	851	5,031	6,555
Total foundation approach	351	509	304	3,786	6,318	11,269

	Dec 31, 2016					
in € m.	Up to one month	Over 1 month to not more than 1 year	Over 1 year to not more than 2 years	Over 2 years to not more than 5 years	Over 5 years	Total
Standardized approach						
Central governments or central banks	77,198	10,251	5,409	19,978	1	112,836
Regional governments or local authorities	194	4,231	954	5,274	3,458	14,111
Public sector entities	83	558	945	5,939	162	7,687
Multilateral development banks	6	175	838	5,313	0	6,331
International organizations	0	290	520	785	0	1,595
Institutions	3,685	2,835	11,647	4,344	13	22,525
Corporates	508	4,174	1,635	5,002	414	11,734
thereof: SMEs	112	106	37	272	29	554
Retail	1,028	404	197	1,018	2,072	4,719
thereof: SMEs	65	21	20	106	20	233
Secured by mortgages on immovable property	89	616	108	536	1,962	3,312
thereof: SMEs	65	33	38	303	12	450
Exposures in default	188	444	68	651	192	1,543
Items associated with particular high risk	13	2	1	17	13	46
Covered bonds	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	0	0
Equity	0	343	0	713	0	1,057
Other items	0	7	3	812	969	1,791
Securitization positions	0	74	456	2,056	2	2,588
Total standardized approach	82,993	24,404	22,783	52,439	9,258	191,875
Risk exposure amount for default funds contributions	N/M	N/M	N/M	N/M	N/M	423
Total	256,567	165,594	84,041	266,509	230,635	1,010,058
Thereof counterparty credit risk from						
Derivatives	17	22,032	27,195	48,858	170	98,273
Securities financing transactions	52,262	13,019	668	2,501	0	68,451

N/M – Not meaningful

Dec 31, 2015

in € m.	Up to one month	Over 1 month to not more than 1 year	Over 1 year to not more than 2 years	Over 2 years to not more than 5 years	Over 5 years	Total
Advanced IRBA						
Central governments and central banks	59,670	11,308	2,284	16,120	3,870	93,253
Institutions	18,150	21,458	3,715	16,421	0	59,745
Corporates	39,259	100,373	34,544	147,303	2,011	323,491
thereof:						
SMEs	1,192	2,126	646	5,981	147	10,092
Specialized Lending	304	1,101	638	1,875	1,445	5,363
Other	37,763	97,145	33,260	139,447	420	308,036
Retail	10,622	5,944	4,343	15,849	161,575	198,333
thereof:						
Secured by real estate SME	106	158	210	856	12,213	13,542
Secured by real estate non-SME	1,356	2,403	2,538	6,908	133,888	147,093
Qualifying revolving	4,032	162	0	0	0	4,194
Other SME	2,605	1,334	346	1,545	1,575	7,405
Other non-SME	2,523	1,887	1,249	6,540	13,900	26,099
Equity	59	1,446	2	4,425	160	6,091
thereof:						
Private equity exposures sufficiently diversified (190 %)	0	0	0	137	0	137
Exchange-traded exposures (290 %)	0	0	0	104	0	104
Other equity exposures (370 %)	59	1,437	0	1,107	65	2,667
Significant financial sector investments subject to threshold exemptions (250 %)	0	9	1	3,078	95	3,183
Securitization positions	1,740	3,156	3,459	26,596	38,085	73,036
Other non-credit obligation assets	N/M	N/M	N/M	N/M	N/M	5,552
Total advanced IRBA	129,500	143,685	48,347	226,715	205,701	759,501
Foundation approach						
Central governments and central banks	0	0	0	0	0	0
Institutions	0	2	0	0	0	2
Corporates	402	589	481	3,353	6,039	10,864
thereof:						
SMEs	7	4	16	10	210	247
Specialized Lending	119	403	264	2,704	961	4,451
Other	276	182	201	639	4,869	6,167
Total foundation approach	402	591	481	3,353	6,039	10,866

Dec 31, 2015						
in € m.	Up to one month	Over 1 month to not more than 1 year	Over 1 year to not more than 2 years	Over 2 years to not more than 5 years	Over 5 years	Total
Standardized approach						
Central governments or central banks	35,487	2,660	7,262	26,317	0	71,726
Regional governments or local authorities	234	6,238	1,502	6,623	4,042	18,639
Public sector entities	105	1,239	1,631	9,223	189	12,387
Multilateral development banks	12	230	324	6,545	0	7,111
International organizations	0	286	664	2,659	0	3,609
Institutions	1,841	6,425	7,414	12,165	137	27,982
Corporates	1,026	4,245	1,629	6,602	486	13,989
thereof: SMEs	145	72	133	324	78	752
Retail	1,201	490	452	2,030	3,006	7,179
thereof: SMEs	96	22	32	149	17	316
Secured by mortgages on immovable property	372	1,001	520	1,391	2,552	5,837
thereof: SMEs	120	34	66	410	6	636
Exposures in default	668	385	821	684	295	2,853
Items associated with particular high risk	15	8	7	124	58	213
Covered bonds	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0
Collective investments undertakings (CIU)	0	0	0	0	0	0
Equity	0	560	0	981	0	1,541
Other items	0	64	12	142	668	884
Securitization positions	21	73	330	1,998	302	2,724
Total standardized approach	40,983	23,905	22,568	77,482	11,735	176,673
Risk exposure amount for default funds contributions	N/M	N/M	N/M	N/M	N/M	543
Total	170,885	168,180	71,396	307,551	223,476	947,582
Thereof counterparty credit risk from						
Derivatives	685	26,788	19,922	57,021	496	104,912
Securities financing transactions	38,536	6,716	799	4,203	0	50,254

N/M – Not meaningful

The increase in the exposure class “Central governments and central banks” in the residual maturity band “Up to one month” is predominantly driven by higher interest earning deposits with central banks. The increase in the exposure class “Corporates Other” and the residual maturity band “Up to one month” is mainly driven by a change in netting agreements for a selected portfolio set in our security financing transactions and for the residual maturity band “Over 1 year to not more than 2 years” from higher exposures in loan and loan commitments in the leveraged debt business. Reductions in the exposure class “Equity” are driven by the aforementioned sales of our Abbey Life and Hua Xia stakes. The increase in the exposure class “Central governments or central banks” in the residual maturity band “Up to one month” is mainly driven by higher interest earning deposits with central banks.

Advanced IRBA – Model validation results

The reviews conducted in 2016 for advanced IRBA rating systems including Postbank triggered recalibrations as shown in the table below. Changes in overall counts of parameters compared to previous year are due to changes in granularity in existing risk parameter assignment. None of the recalibrations individually nor the impact of all recalibrations in the aggregate materially impacted our regulatory capital requirements.

Validation results for risk parameters used in our advanced IRBA

	2016					
	PD		LGD		EAD	
	Count	EAD in %	Count	EAD in %	Count	EAD in %
Appropriate	124	85.8	115	79.3	67	95.2
Overly conservative	11	2.8	27	7.9	16	4.2
Progressive	56	11.5	36	12.8	6	0.5
Total	191	100.0	178	100.0	89	100.0

Thereof already recalibrated and introduced in 2016

	Count	EAD in %	Count	EAD in %	Count	EAD in %
Overly conservative	2	0.1	1	4.0	10	3.9
Progressive	41	9.6	4	1.0	0	0.0
Total	43	9.7	5	5.0	10	3.9

	2015					
	PD		LGD		EAD	
	Count	EAD in %	Count	EAD in %	Count	EAD in %
Appropriate	154	85.6	133	88.0	67	93.3
Overly conservative	2	0.3	9	10.5	12	5.2
Progressive	22	14.1	23	1.6	5	1.5
Total	178	100.0	165	100.0	84	100.0

Thereof already recalibrated and introduced in 2015

	Count	EAD in %	Count	EAD in %	Count	EAD in %
Overly conservative	0	0.0	1	3.5	4	4.2
Progressive	2	10.1	9	0.3	0	0.0
Total	2	10.1	10	3.8	4	4.2

Individual risk parameter settings are classified as appropriate if no recalibration was triggered by the validation and thus the application of the current parameter setting is continued since still sufficiently conservative. A parameter classifies as overly conservative or progressive if the validation triggers a recalibration analysis leading to a potential downward or upward change of the current setting, respectively. The breakdown for PD, LGD and EAD is presented by number as well as by the relative EAD attached to the respective parameter as of December 31, 2016 and December 31, 2015.

The validations during 2016 largely confirmed our parameter settings. Negatively validated PD parameters with high materiality were caused by four rating systems. For two Deutsche Bank rating systems contributing around 5.2 % of EAD and one Postbank rating system contributing around 3.9 % of EAD the PD parameter was classified as too progressive, all these parameters were already amended. One Deutsche Bank rating system contributed to 2.4 % EAD and the PD was classified as overly conservative. The recalibration is scheduled for implementation in 2017. In addition, one LGD parameter of Deutsche Bank contributed around 6.9 % of EAD and was classified as too progressive. The recalibration was already performed and is scheduled for implementation in Q2 2017 pending regulatory approval. One Postbank LGD parameter classified as overly conservative contributed 4.0 % of EAD and was already amended. One Deutsche Bank LGD parameter classified as too progressive contributed 1.4 % of EAD, amendment is scheduled for 2017. Furthermore, 13 LGD parameters classified as too progressive and 18 parameters classified as overly conservative contributed in total to 4.2 % of EAD and will be fixed by a single methodology change. Implementation of these already recalibrated parameters is currently pending regulatory approval. One EAD parameter contributing 3.6 % to the free limit was classified as overly conservative and the parameter was already amended. All other negatively validated

parameters are only applied to smaller portfolios. Out of the 152 risk parameters, where a change was suggested during 2016 following their validation, 58 were already amended in 2016.

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 2015 through 2011, with actual losses recorded for the financial years 2016 through 2012, 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

	Dec 31, 2015	2016	Dec 31, 2014	2015	Dec 31, 2013	2014	Dec 31, 2012	2013	Dec 31, 2011	2012
in € m.	Expected loss	Actual loss	Expected loss ¹	Actual loss	Expected loss	Actual loss	Expected loss	Actual loss	Expected loss	Actual loss
Central governments and central banks	2	3	3	0	3	0	3	18	1	0
Institutions	12	0	12	0	13	4	10	1	7	14
Corporates	369	697	300	334	355	229	351	717	445	393
Retail exposures secured by real estate property	305	177	306	207	324	212	284	223	294	224
Qualifying revolving retail exposures	13	4	17	4	21	8	23	7	23	12
Other retail exposures	339	704	334	354	378	355	404	370	418	385
Total expected loss and actual loss in the advanced IRBA	1,041	1,584	971	900	1,095	808	1,075	1,336	1,188	1,028

¹ 2013 EL figures are based on pro forma CRR/CRD 4.

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 actual loss in 2013 exceeded the expected loss by €261 million or 24 %. This was primarily due to higher than expected level of provisions in our corporate portfolio driven by a large single client credit event in a usually low risk portfolio of GTB as well as one large charge within NCOU. Additionally, actual loss for central governments was higher than expected driven by one single client. Better than expected performance in all retail exposure classes as well as in institutions partly offset the overall excess of actual compared to expected loss.

The actual loss in 2012 was 13 % lower than the expected loss across all exposure classes apart from institutions, where actual loss was driven by one single client.

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 decrease in expected loss as of December 31, 2012 in comparison to December 31, 2011 is mainly resulting from exposure reductions 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.	2016	2015	2014	2013	2012
Central governments and central banks	3	0	0	18	0
Institutions	0	0	4	1	14
Corporates	697	334	229	717	393
Retail exposures secured by real estate property	177	207	212	223	224
Qualifying revolving retail exposures	4	4	8	7	12
Other retail exposures	704	354	355	370	385
Total actual loss by IRBA in the advanced IRBA	1,584	900	808	1,336	1,028

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.

Actual loss materially declined in 2014 compared to prior year due to the low level of new impairments across all businesses.

In 2013 the actual loss increased by €308 million or 30 % compared to 2012 primarily driven by our corporate portfolio and to a minor extent by exposures to central governments. The increase in our corporate portfolio was caused by a single client credit event along with higher actual losses for shipping companies recorded in CIB as well as one large charge in NCOU related to the European Commercial Real Estate sector, while higher actual losses in central governments result from a charge to one single client. These increases were partly offset by slight reductions in our retail portfolios as well as in institutions.

Advanced IRBA Exposure

The following sections analyze our advanced IRBA credit exposures by obligor grade for exposure classes central governments and central banks, institutions, corporates and retail including relevant subcategories.

The table below sets out the mapping of internal ratings to obligor default probabilities following the internal rating process as outlined in section Credit Risk Measurement. 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

In the following tables we show our advanced IRBA credit exposures distributed on our internal rating scale. They also include our counterparty credit risk position from derivatives and securities financing transactions so far as it has been assigned to the advanced IRBA. For the vast majority of these exposures we make use of the internal model method ("IMM") to derive the EAD where the appropriate netting and collateral agreements are already considered resulting in an EAD net of collateral.

The EAD gross information for exposures covered by guarantees or credit derivatives is assigned to the exposure class of the original counterparty respectively whereas the EAD net information assigns the exposures to the protection seller. As a consequence the EAD net can be higher than the EAD gross.

The EAD net is presented in conjunction with exposures-weighted average PD and LGD, the RWA and the average risk weight (RW). 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 ratio of expected loss by EAD for the non-defaulted exposures is provided in addition. For defaulted exposure, we apply a LGD conception already incorporating potential unexpected losses in the loss rate estimate as required by Article 181 (1) (h) CRR.

EAD for Advanced IRBA credit exposures by PD grade with central governments and central banks

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	113,368	122,223	2,994	2,200	0.00	10.99	321	0.26	0.00
iAA+	702	734	185	0	0.02	33.22	79	10.73	0.01
iAA	648	648	61	17	0.03	27.58	71	10.88	0.01
iAA-	560	560	533	47	0.04	74.07	114	20.42	0.01
iA+	2,233	2,233	139	0	0.05	47.99	345	15.44	0.02
iA	1,088	1,088	282	0	0.07	47.55	180	16.54	0.03
iA-	1,310	2,601	161	347	0.09	48.36	1,124	43.22	0.04
iBBB+	477	317	218	25	0.14	32.67	108	34.05	0.05
iBBB	1,812	1,711	699	23	0.23	47.62	645	37.72	0.11
iBBB-	3,131	3,214	312	0	0.39	49.99	1,881	58.54	0.19
iBB+	483	404	92	3	0.64	46.08	319	79.04	0.29
iBB	341	159	1	3	1.07	46.60	154	96.31	0.50
iBB-	1,073	739	697	0	1.76	59.14	331	44.76	1.04
iB+	1,559	770	15	3	2.92	17.29	378	49.15	0.50
iB	337	337	334	0	4.82	19.12	234	69.39	0.92
iB-	322	46	0	5	7.95	48.44	96	207.89	3.85
iCCC+	299	54	0	0	13.19	46.90	135	249.04	6.10
iCCC	0	0	0	0	0.00	0.00	0	0.00	0.00
iCCC-	182	83	79	1	31.00	2.82	15	17.87	0.87
Total excluding default	129,925	137,922	6,801	2,675	0.08	14.93	6,529	4.73	0.02
Default	80	11	0	1	100.00	67.12	1	10.63	N/M
Total including default	134,368¹	142,294¹	6,801	2,676	0.08	14.93	17,436¹	4.73	0.02

N/M – Not meaningful

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

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	72,130	79,673	2,760	3,077	0.00	49.37	595	0.75	0.00
iAA+	4,822	4,822	3,725	0	0.02	32.53	280	5.80	0.01
iAA	273	273	46	16	0.03	30.83	32	11.75	0.01
iAA-	944	944	605	142	0.04	28.32	179	18.99	0.01
iA+	1,687	1,687	120	0	0.05	49.22	248	14.70	0.02
iA	1,388	2,077	321	339	0.07	47.78	686	33.03	0.03
iA-	1,225	2,047	333	119	0.09	49.54	844	41.24	0.04
iBBB+	459	324	227	53	0.14	33.66	125	38.45	0.05
iBBB	1,277	1,172	576	2	0.23	43.92	405	34.56	0.10
iBBB-	2,150	2,066	124	3	0.39	49.65	1,181	57.17	0.19
iBB+	249	118	101	5	0.64	38.84	107	91.16	0.25
iBB	239	100	1	1	1.07	46.97	109	109.65	0.50
iBB-	1,606	448	14	5	1.76	5.46	74	16.39	0.10
iB+	200	58	0	0	2.92	49.77	76	131.48	1.45
iB	3	3	0	0	4.82	24.32	3	85.71	1.17
iB-	290	56	0	6	7.95	49.95	119	210.57	3.97
iCCC+	597	232	153	2	13.07	25.49	303	130.48	3.32
iCCC	6	0	0	0	22.00	0.12	0	0.00	0.03
iCCC-	0	0	0	0	31.00	49.38	1	350.00	15.31
Total excluding default	89,544	96,100	9,106	3,771	0.07	47.84	5,367	5.58	0.02
Default	8	8	0	0	100.00	51.11	1	15.68	N/M
Total including default	93,253	99,809	9,106	3,771	0.07	47.84	14,619	5.58	0.02

N/M – Not meaningful

The EAD gross associated with the advanced IRBA exposure to central governments and central banks has increased by €41.1 billion. This is predominantly driven by higher volumes in interest earning deposits with central banks.

EAD for Advanced IRBA credit exposures by PD grade with institutions

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	802	1,093	384	174	0.02	38.95	176	16.14	0.01
iAA+	1,016	1,023	963	25	0.03	30.99	46	4.53	0.01
iAA	7,888	8,054	4,807	896	0.03	28.25	338	4.19	0.01
iAA-	10,139	14,344	6,267	10,539	0.03	52.47	1,282	8.94	0.01
iA+	8,864	9,170	5,563	775	0.05	35.24	1,553	16.94	0.02
iA	7,206	7,403	4,915	197	0.07	36.33	1,446	19.53	0.03
iA-	5,831	6,047	4,017	499	0.09	29.24	1,449	23.96	0.03
iBBB+	2,211	2,079	1,282	191	0.14	24.13	478	22.97	0.03
iBBB	679	618	134	111	0.23	39.16	232	37.63	0.09
iBBB-	3,752	3,352	574	197	0.39	34.66	1,763	52.59	0.13
iBB+	1,670	1,706	1,044	80	0.64	21.92	717	42.03	0.14
iBB	566	506	84	70	1.07	25.32	265	52.41	0.27
iBB-	8,678	8,625	7,286	42	1.76	59.69	1,953	22.64	0.67
iB+	72	76	19	0	2.92	18.11	43	57.18	0.53
iB	583	521	8	465	4.82	36.99	837	160.53	1.78
iB-	38	38	2	0	7.95	7.25	12	30.99	0.58
iCCC+	271	271	114	57	13.98	5.61	76	28.19	0.77
iCCC	11	11	3	0	22.00	16.07	9	89.44	3.54
iCCC-	21	17	7	3	31.00	25.51	30	173.45	7.91
Total excluding default	60,302	64,955	37,473	14,322	0.44	40.06	12,707	19.56	0.14
Default	754	754	120	0	100.00	5.43	565	74.91	N/M
Total including default	61,056	65,709	37,593	14,322	0.44	40.06	13,272	19.56	0.14

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	2,208	2,850	893	265	0.02	41.35	491	17.21	0.01
iAA+	284	295	175	32	0.03	29.11	32	10.74	0.01
iAA	3,947	4,177	1,912	393	0.03	41.91	393	9.40	0.01
iAA-	8,584	9,467	4,838	1,896	0.04	44.14	1,321	13.95	0.02
iA+	12,343	12,845	8,833	1,556	0.05	25.75	1,652	12.86	0.01
iA	11,350	11,665	6,394	444	0.07	33.64	2,104	18.03	0.02
iA-	6,539	6,883	2,831	739	0.09	32.83	2,083	30.26	0.03
iBBB+	2,479	2,518	1,214	114	0.14	28.66	546	21.70	0.04
iBBB	1,742	1,810	1,133	166	0.23	20.68	455	25.16	0.05
iBBB-	6,750	5,777	1,384	301	0.39	32.32	2,856	49.44	0.13
iBB+	779	664	266	28	0.64	35.29	438	65.97	0.23
iBB	1,018	837	136	492	1.07	33.28	560	66.92	0.36
iBB-	830	804	101	72	1.76	16.38	367	45.61	0.29
iB+	194	185	72	53	2.92	28.51	110	59.56	0.56
iB	457	419	55	22	4.82	35.53	600	143.01	1.71
iB-	20	17	2	23	7.95	31.20	23	139.60	2.48
iCCC+	116	116	0	45	15.84	3.88	22	19.03	0.61
iCCC	7	7	1	4	21.88	14.49	6	90.69	3.16
iCCC-	25	25	11	7	31.00	27.93	47	191.99	8.66
Total excluding default	59,671	61,361	30,251	6,653	0.23	33.43	14,106	22.99	0.06
Default	74	74	0	0	100.00	11.68	43	57.60	N/M
Total including default	59,745	61,435	30,251	6,653	0.23	33.43	14,149	22.99	0.06

N/M – Not meaningful

The undrawn commitments associated with the advanced IRB exposure to institutions increased by €7.6 billion during the reporting period, mainly driven by higher positions with clearing corporations. The increase in counterparty credit

risk reflects higher exposures across all rating classes mainly resulting from changes for selected portfolios in derivatives in relation to their margin period of risk.

EAD for Advanced IRBA credit exposures by PD grade with corporates

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	8,958	8,979	4,847	3,883	0.03	23.31	1,254	13.96	0.01
iAA+	31,624	31,630	26,407	4,579	0.03	25.30	1,435	4.54	0.01
iAA	12,400	12,301	5,430	6,431	0.03	24.91	932	7.57	0.01
iAA-	21,674	23,044	12,227	11,632	0.04	34.24	3,042	13.20	0.01
iA+	16,602	16,683	4,695	14,679	0.05	32.43	2,595	15.55	0.02
iA	19,975	20,129	2,993	16,318	0.07	32.00	3,874	19.24	0.02
iA-	25,118	25,528	4,149	22,474	0.09	35.76	6,319	24.75	0.03
iBBB+	24,830	23,535	3,366	19,049	0.14	34.03	6,854	29.12	0.05
iBBB	24,582	23,723	3,405	19,431	0.23	31.22	8,236	34.72	0.07
iBBB-	27,264	25,814	5,946	16,520	0.39	26.56	9,251	35.84	0.10
iBB+	21,008	19,894	4,874	11,442	0.64	27.84	9,433	47.41	0.17
iBB	16,683	15,270	1,850	6,795	1.08	25.60	8,342	54.63	0.26
iBB-	21,963	20,241	5,894	7,828	1.76	34.15	12,662	62.56	0.59
iB+	12,783	10,464	505	7,193	2.92	22.45	6,713	64.15	0.64
iB	13,265	11,147	596	8,016	4.80	19.40	7,625	68.40	0.91
iB-	5,897	5,233	344	2,941	7.93	14.72	3,203	61.21	1.16
iCCC+	8,531	8,006	648	2,219	13.74	8.08	3,241	40.48	1.11
iCCC	3,560	2,997	104	828	22.00	11.19	1,852	61.80	2.46
iCCC-	2,008	1,442	502	243	30.96	12.54	1,029	71.35	3.88
Total excluding default	318,724	306,061	88,783	182,501	1.43	28.46	97,890	31.98	0.23
Default	9,070	8,282	42	588	100.00	29.24	2,502	30.21	N/M
Total including default	327,795	314,343	88,824	183,090	1.43	28.46	100,392	31.98	0.23

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	11,512	11,483	5,965	3,798	0.03	24.06	1,128	9.82	0.01
iAA+	23,717	23,633	17,380	5,417	0.03	28.73	2,097	8.87	0.01
iAA	15,659	15,597	5,244	10,023	0.03	23.38	1,235	7.92	0.01
iAA-	16,360	19,169	7,611	11,459	0.04	36.31	2,976	15.53	0.01
iA+	17,620	18,249	5,383	14,715	0.05	33.09	2,957	16.20	0.02
iA	23,457	24,549	4,257	21,159	0.07	33.09	4,945	20.15	0.02
iA-	27,721	28,405	5,683	17,618	0.09	33.39	6,677	23.51	0.18
iBBB+	25,938	25,958	3,832	19,955	0.14	35.17	7,805	30.07	0.05
iBBB	25,397	25,006	2,911	16,137	0.23	30.98	8,639	34.55	0.07
iBBB-	28,663	26,960	5,853	15,952	0.39	29.08	10,585	39.26	0.10
iBB+	20,173	19,247	5,612	13,119	0.64	28.89	9,840	51.12	0.18
iBB	20,726	18,768	3,244	14,362	1.07	29.12	12,129	64.63	0.30
iBB-	20,671	18,239	1,987	11,327	1.76	27.11	10,898	59.75	0.39
iB+	12,610	10,394	755	6,155	2.92	20.63	6,440	61.95	0.59
iB	11,953	10,019	516	8,691	4.81	20.73	7,538	75.23	0.97
iB-	5,181	4,140	658	2,923	7.93	19.49	3,369	81.38	1.52
iCCC+	5,343	4,964	425	1,089	14.55	8.96	2,223	44.79	1.20
iCCC	1,582	1,282	213	376	21.85	20.68	1,572	122.61	4.56
iCCC-	1,544	1,132	685	143	31.00	6.80	435	38.41	2.27
Total excluding default	315,827	307,193	78,216	194,417	1.10	29.41	103,488	33.69	0.21
Default	7,663	7,032	31	437	100.00	28.27	1,970	28.02	N/M
Total including default	323,491	314,225	78,246	194,855	1.10	29.41	105,459	33.69	0.21

N/M – Not meaningful

¹ Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

The majority of these exposures are assigned to investment-grade customers. The exposures in the lowest rating classes are predominantly collateralized.

The EAD increase for counterparty credit risk mainly reflects a change in the application of netting agreements for a selected portfolio set in our securities financing transactions. The decrease in undrawn commitments results from reductions in specific businesses in the Americas region.

EAD for advanced IRBA credit exposures by PD grade with retail exposures total

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	101	196	0	91	0.03	26.24	5	2.68	0.01
iAA+	238	387	4	244	0.03	28.70	10	2.48	0.01
iAA	525	1,089	0	436	0.03	35.96	35	3.20	0.01
iAA-	990	1,001	1	399	0.04	27.61	27	2.72	0.01
iA+	1,019	1,056	1	436	0.05	21.63	29	2.71	0.01
iA	3,650	3,729	4	1,009	0.07	19.67	115	3.09	0.01
iA-	10,284	10,343	1	1,793	0.09	17.34	393	3.80	0.02
iBBB+	14,238	14,352	5	2,181	0.14	16.23	735	5.12	0.02
iBBB	26,638	26,730	7	2,793	0.23	15.47	1,900	7.11	0.03
iBBB-	35,913	35,973	7	3,053	0.39	15.58	3,745	10.41	0.06
iBB+	37,199	37,220	8	2,839	0.66	17.13	6,173	16.59	0.11
iBB	23,368	23,365	8	2,077	1.13	20.49	6,133	26.25	0.23
iBB-	16,540	16,556	7	1,549	1.85	23.87	6,160	37.21	0.44
iB+	6,911	6,944	6	484	2.92	25.37	3,072	44.24	0.74
iB	8,956	8,949	6	1,005	4.22	23.70	4,511	50.41	1.00
iB-	4,518	4,474	0	353	7.56	25.69	2,891	64.62	1.93
iCCC+	2,000	1,961	0	106	12.90	25.64	1,530	78.02	3.29
iCCC	2,184	2,163	0	59	20.69	27.04	2,229	103.05	5.56
iCCC-	1,015	978	0	21	32.53	25.24	1,017	104.00	8.05
Total excluding default	196,287	197,466	69	20,927	1.51	18.81	40,709	20.62	0.35
Default	4,399	4,185	0	54	100.00	37.23	607	14.51	N/M
Total including default	200,686	201,650	69	20,981	1.51	18.81	41,317	20.62	0.35

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	44	121	0	58	0.03	20.79	6	4.64	0.01
iAA+	169	308	1	178	0.03	32.93	9	2.86	0.01
iAA	502	1,215	1	645	0.03	38.97	43	3.56	0.01
iAA-	978	1,134	0	369	0.04	18.86	40	3.51	0.01
iA+	919	943	1	404	0.05	18.37	17	1.81	0.01
iA	3,230	3,305	1	939	0.07	16.99	80	2.42	0.01
iA-	10,113	10,183	6	1,807	0.09	16.30	355	3.48	0.02
iBBB+	14,605	14,771	9	2,106	0.14	16.61	764	5.17	0.02
iBBB	23,672	23,668	12	2,546	0.23	15.92	1,797	7.59	0.04
iBBB-	32,013	32,021	6	2,642	0.38	16.46	3,531	11.03	0.06
iBB+	37,158	37,147	21	2,690	0.67	17.95	6,368	17.14	0.12
iBB	27,723	27,693	13	2,273	1.12	18.34	6,567	23.71	0.21
iBB-	18,032	18,009	7	1,825	1.84	19.97	5,832	32.38	0.37
iB+	6,202	6,185	6	579	2.92	22.38	2,485	40.18	0.65
iB	7,972	7,963	2	850	4.19	23.41	3,955	49.67	0.98
iB-	4,629	4,619	1	381	7.53	24.44	2,882	62.38	1.83
iCCC+	2,050	2,050	0	128	12.89	24.38	1,569	76.53	3.12
iCCC	2,547	2,548	0	70	19.18	23.71	2,439	95.70	4.47
iCCC-	948	929	1	17	31.00	23.96	955	102.81	7.41
Total excluding default	193,507	194,813	88	20,507	1.54	18.35	39,694	20.38	0.33
Default	4,826	4,689	0	52	100.00	35.33	287	6.11	N/M
Total including default	198,334	199,502	88	20,558	1.54	18.35	39,981	20.38	0.33

N/M – Not meaningful

¹ Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

The risk parameters and EAD associated with the total advanced IRBA retail exposure remained broadly stable during the reporting period.

EAD for advanced IRBA credit exposures by PD grade with retail exposures secured by real estate SME

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	0	0	0	0	0.00	0.00	0	0.00	0.00
iAA+	0	0	0	0	0.03	5.40	0	0.00	0.00
iAA	2	2	0	0	0.03	10.38	0	1.24	0.00
iAA-	7	7	0	0	0.04	13.86	0	1.82	0.01
iA+	19	19	0	5	0.05	22.97	1	2.92	0.01
iA	59	59	0	0	0.07	8.97	1	1.56	0.01
iA-	179	179	0	4	0.09	10.67	4	2.28	0.01
iBBB+	531	531	0	20	0.14	10.65	17	3.12	0.01
iBBB	1,250	1,248	0	28	0.23	9.74	51	4.08	0.02
iBBB-	1,802	1,796	0	60	0.39	9.80	107	5.96	0.04
iBB+	1,804	1,797	0	61	0.64	10.24	158	8.82	0.07
iBB	1,335	1,316	0	39	1.07	10.09	160	12.13	0.11
iBB-	997	981	0	30	1.76	10.44	170	17.31	0.18
iB+	616	604	0	15	2.92	10.16	137	22.71	0.29
iB	370	364	0	8	4.82	10.16	109	29.94	0.48
iB-	187	181	0	3	7.95	9.59	66	36.32	0.75
iCCC+	110	107	0	1	13.00	9.76	48	44.92	1.25
iCCC	67	65	0	1	21.99	10.38	36	55.48	2.23
iCCC-	64	61	0	0	31.00	12.67	39	64.37	3.63
Total excluding default	9,400	9,319	0	275	1.62	10.13	1,104	11.85	0.16
Default	145	131	0	1	100.00	23.74	8	6.36	N/M
Total including default	9,546	9,451	0	276	1.62	10.13	1,112	11.85	0.16

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	0	0	0	0	0.00	0.00	0	0.00	0.00
iAA+	1	1	0	0	0.03	5.21	0	0.00	0.00
iAA	7	7	0	0	0.03	10.77	0	0.89	0.00
iAA-	14	14	0	0	0.04	8.35	0	0.91	0.00
iA+	57	57	0	12	0.05	14.17	1	1.75	0.01
iA	109	109	0	2	0.07	9.35	2	1.63	0.01
iA-	405	405	0	9	0.09	10.65	9	2.17	0.01
iBBB+	924	923	0	23	0.14	9.84	26	2.83	0.01
iBBB	1,478	1,471	0	37	0.23	10.19	63	4.31	0.02
iBBB-	2,047	2,042	0	67	0.39	10.04	131	6.42	0.04
iBB+	2,494	2,487	0	96	0.64	10.15	234	9.40	0.06
iBB	2,514	2,501	0	118	1.07	10.86	356	14.25	0.12
iBB-	1,549	1,542	0	85	1.76	10.95	303	19.63	0.19
iB+	717	710	0	24	2.92	11.47	194	27.27	0.33
iB	408	405	0	12	4.82	12.31	156	38.52	0.59
iB-	242	238	0	4	7.95	11.00	104	43.78	0.87
iCCC+	173	171	0	3	13.00	10.22	86	49.99	1.32
iCCC	118	117	0	2	22.00	11.99	80	68.00	2.62
iCCC-	116	114	0	2	31.00	11.95	78	68.58	3.61
Total excluding default	13,372	13,313	0	496	1.69	10.55	1,822	13.69	0.19
Default	170	166	0	2	100.00	19.11	3	1.70	N/M
Total including default	13,542	13,479	0	498	1.69	10.55	1,825	13.69	0.19

N/M – Not meaningful

EAD for advanced IRBA credit exposures by PD grade with retail exposures secured by real estate non-SME

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	8	8	0	0	0.03	16.64	0	1.72	0.00
iAA+	39	39	0	1	0.03	11.00	0	1.13	0.00
iAA	211	211	0	2	0.03	8.52	2	0.85	0.00
iAA-	483	483	0	6	0.04	10.14	7	1.39	0.00
iA+	684	684	0	5	0.05	13.41	18	2.65	0.01
iA	2,843	2,843	0	37	0.07	14.30	80	2.83	0.01
iA-	8,622	8,622	0	228	0.09	14.07	303	3.51	0.01
iBBB+	11,614	11,613	0	346	0.14	13.08	528	4.55	0.02
iBBB	22,305	22,300	0	754	0.23	12.75	1,377	6.18	0.03
iBBB-	30,217	30,206	0	1,100	0.38	12.92	2,731	9.04	0.05
iBB+	30,742	30,726	0	1,333	0.67	13.75	4,380	14.25	0.09
iBB	16,940	16,919	0	1,027	1.13	13.05	3,315	19.59	0.15
iBB-	10,519	10,493	0	906	1.87	12.09	2,624	25.01	0.23
iB+	3,749	3,734	0	111	2.92	9.91	1,019	27.30	0.29
iB	5,869	5,860	0	760	4.14	12.87	2,392	40.82	0.51
iB-	2,713	2,706	0	254	7.52	13.40	1,568	57.97	0.99
iCCC+	1,133	1,128	0	61	12.88	13.38	820	72.68	1.71
iCCC	1,357	1,354	0	34	20.56	16.29	1,342	99.09	3.29
iCCC-	629	624	0	5	33.20	14.73	580	92.99	4.87
Total excluding default	150,676	150,551	0	6,970	1.31	13.08	23,087	15.33	0.17
Default	1,914	1,894	0	23	100.00	19.93	196	10.37	N/M
Total including default	152,590	152,444	0	6,992	1.31	13.08	23,284	15.33	0.17

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	5	5	0	0	0.03	6.11	0	0.63	0.00
iAA+	39	39	0	0	0.03	8.64	0	1.10	0.00
iAA	199	199	0	3	0.03	8.07	2	0.82	0.00
iAA-	444	444	0	7	0.04	8.71	5	1.11	0.00
iA+	570	570	0	5	0.05	8.76	8	1.38	0.00
iA	2,363	2,362	0	38	0.07	10.36	46	1.94	0.01
iA-	8,207	8,207	0	184	0.09	12.73	257	3.13	0.01
iBBB+	11,528	11,527	0	269	0.14	13.51	534	4.63	0.02
iBBB	18,950	18,948	0	535	0.23	13.06	1,272	6.71	0.03
iBBB-	25,744	25,739	0	793	0.38	12.92	2,377	9.23	0.05
iBB+	29,606	29,598	0	1,117	0.67	13.88	4,284	14.47	0.09
iBB	20,408	20,396	0	1,154	1.13	13.04	3,960	19.42	0.15
iBB-	12,412	12,398	0	1,033	1.85	12.33	3,135	25.29	0.23
iB+	3,357	3,342	0	159	2.92	10.66	980	29.34	0.31
iB	5,082	5,077	0	553	4.08	13.56	2,129	41.93	0.54
iB-	2,756	2,752	0	227	7.46	14.00	1,632	59.32	1.03
iCCC+	1,165	1,161	0	65	12.87	14.37	892	76.80	1.83
iCCC	1,786	1,782	0	46	18.96	16.08	1,669	93.65	2.96
iCCC-	564	554	0	3	31.00	16.06	567	102.35	4.97
Total excluding default	145,187	145,099	0	6,192	1.37	13.11	23,749	16.37	0.19
Default	1,906	1,881	0	20	100.00	22.11	93	4.95	N/M
Total including default	147,093	146,980	0	6,212	1.37	13.11	23,842	16.37	0.19

N/M – Not meaningful

EAD for Advanced IRBA Credit Exposures by PD Grade with Qualifying Revolving Retail Exposures

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	15	15	0	29	0.03	46.41	0	1.13	0.01
iAA+	57	57	0	100	0.03	45.47	1	1.15	0.01
iAA	174	174	0	267	0.03	45.35	2	1.19	0.01
iAA-	188	188	0	281	0.04	45.30	3	1.48	0.02
iA+	204	204	0	303	0.05	45.21	4	1.77	0.02
iA	446	446	0	657	0.07	45.22	11	2.36	0.03
iA-	628	628	0	915	0.09	45.00	18	2.88	0.04
iBBB+	551	551	0	794	0.14	44.90	23	4.11	0.06
iBBB	460	460	0	652	0.23	44.96	28	6.13	0.10
iBBB-	385	385	0	528	0.39	45.77	36	9.46	0.18
iBB+	305	305	0	385	0.65	48.64	46	14.95	0.32
iBB	222	222	0	234	1.10	49.77	51	22.95	0.55
iBB-	157	157	0	133	1.81	49.91	52	33.46	0.92
iB+	79	79	0	52	2.92	46.39	35	44.27	1.35
iB	71	71	0	46	4.45	53.00	46	64.83	2.31
iB-	38	38	0	18	7.71	52.29	35	91.81	4.00
iCCC+	19	19	0	6	12.94	49.85	22	118.54	6.44
iCCC	10	10	0	2	21.59	49.84	15	149.26	10.70
iCCC-	12	12	0	1	32.57	50.41	19	167.77	16.66
Total excluding default	4,019	4,019	0	5,405	0.70	46.15	446	11.10	0.35
Default	21	21	0	1	100.00	46.92	3	15.97	N/M
Total including default	4,040	4,040	0	5,405	0.70	46.15	449	11.10	0.35

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	12	12	0	22	0.03	45.30	0	1.37	0.01
iAA+	58	58	0	97	0.03	44.78	1	1.31	0.01
iAA	181	181	0	277	0.03	45.07	2	1.18	0.01
iAA-	170	170	0	257	0.04	45.08	3	1.48	0.02
iA+	190	190	0	279	0.05	44.70	3	1.78	0.02
iA	429	429	0	635	0.07	44.93	10	2.32	0.03
iA-	605	605	0	907	0.09	45.47	18	2.92	0.04
iBBB+	585	585	0	845	0.14	44.86	24	4.11	0.06
iBBB	527	527	0	732	0.23	44.69	32	6.14	0.10
iBBB-	446	446	0	578	0.39	43.97	41	9.14	0.17
iBB+	363	363	0	427	0.65	43.48	49	13.46	0.28
iBB	239	239	0	227	1.09	45.55	50	21.06	0.50
iBB-	156	156	0	122	1.80	46.66	49	31.35	0.85
iB+	76	76	0	46	2.92	43.97	32	42.23	1.28
iB	60	60	0	34	4.48	50.93	38	62.68	2.23
iB-	32	32	0	14	7.70	51.48	29	90.25	3.93
iCCC+	16	16	0	5	12.93	48.02	19	113.98	6.20
iCCC	14	14	0	3	20.19	51.72	21	147.11	10.19
iCCC-	9	9	0	1	31.00	41.97	13	142.92	13.01
Total excluding default	4,170	4,170	0	5,507	0.67	44.99	434	10.40	0.31
Default	24	24	0	1	100.00	47.86	3	12.78	N/M
Total including default	4,194	4,194	0	5,507	0.67	44.99	437	10.40	0.31

N/M – Not meaningful

¹ Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

EAD for Advanced IRBA Credit Exposures by PD Grade with Other Retail Exposures SME

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	0	0	0	1	0.03	57.23	0	6.25	0.02
iAA+	3	3	0	6	0.03	28.14	0	2.22	0.01
iAA	2	2	0	5	0.03	50.46	0	4.06	0.02
iAA–	66	66	0	16	0.04	54.29	4	5.44	0.02
iA+	13	13	0	16	0.05	32.52	1	4.16	0.02
iA	41	41	0	57	0.07	42.71	3	7.00	0.03
iA–	167	165	0	194	0.09	33.58	11	6.62	0.03
iBBB+	395	386	2	417	0.14	33.33	35	9.01	0.04
iBBB	694	672	3	611	0.23	32.60	83	12.28	0.08
iBBB–	851	801	4	597	0.39	34.18	144	17.92	0.13
iBB+	817	758	4	435	0.64	36.47	191	25.20	0.23
iBB	734	675	5	322	1.08	41.75	246	36.49	0.45
iBB–	615	553	4	230	1.76	45.67	260	47.15	0.81
iB+	491	422	4	163	2.92	50.47	243	57.68	1.47
iB	352	281	2	104	4.79	53.32	180	64.07	2.55
iB–	223	160	0	47	7.93	49.39	102	63.86	3.91
iCCC+	131	84	0	22	13.00	46.68	60	71.30	6.06
iCCC	79	51	0	11	21.97	51.06	49	96.96	11.21
iCCC–	94	51	0	7	31.12	48.41	53	103.61	15.07
Total excluding default	5,771	5,185	30	3,259	2.01	40.10	1,665	32.12	0.95
Default	222	141	0	7	100.00	64.63	34	24.32	N/M
Total including default	5,993	5,326	30	3,267	2.01	40.10	1,700	32.12	0.95

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	0	0	0	1	0.03	51.61	0	3.70	0.02
iAA+	1	1	0	2	0.03	47.95	0	3.53	0.01
iAA	15	15	0	55	0.03	56.99	1	4.62	0.02
iAA–	15	14	0	41	0.04	46.93	1	4.83	0.02
iA+	17	17	1	19	0.05	29.24	1	3.72	0.01
iA	89	85	0	108	0.05	41.62	8	9.08	0.02
iA–	273	266	2	313	0.08	34.01	20	7.41	0.03
iBBB+	570	549	3	485	0.14	27.90	43	7.83	0.04
iBBB	871	828	3	621	0.23	27.52	87	10.56	0.06
iBBB–	931	884	3	603	0.38	28.37	132	14.97	0.10
iBB+	944	904	7	515	0.63	30.95	191	21.17	0.19
iBB	912	864	6	414	1.05	31.85	234	27.14	0.33
iBB–	798	749	4	331	1.76	32.06	245	32.73	0.57
iB+	624	580	3	243	2.92	31.12	201	34.64	0.91
iB	478	443	1	178	4.81	29.51	149	33.60	1.41
iB–	317	293	1	100	7.94	26.65	93	31.79	2.11
iCCC+	157	145	0	38	13.00	26.17	55	37.55	3.40
iCCC	68	60	0	10	21.87	29.38	33	54.56	6.37
iCCC–	78	65	1	6	31.00	30.34	41	63.56	9.40
Total excluding default	7,157	6,762	35	4,084	2.20	30.14	1,534	22.69	0.64
Default	248	202	0	11	100.00	40.68	2	1.15	N/M
Total including default	7,405	6,965	35	4,094	2.20	30.14	1,537	22.69	0.64

N/M – Not meaningful

1 Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

EAD for Advanced IRBA Credit Exposures by PD Grade with Other Retail Exposures non – SME

in € m.
(unless stated
otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	78	174	0	61	0.03	24.88	5	2.85	0.01
iAA+	139	287	4	138	0.03	27.77	8	2.93	0.01
iAA	135	700	0	162	0.03	41.92	31	4.42	0.01
iAA-	248	259	1	96	0.04	40.95	14	5.41	0.02
iA+	99	136	1	107	0.05	26.39	6	4.25	0.01
iA	261	340	4	258	0.07	30.22	21	6.08	0.02
iA-	687	749	1	452	0.09	29.82	57	7.61	0.03
iBBB+	1,147	1,271	3	605	0.14	29.71	132	10.42	0.04
iBBB	1,930	2,050	4	748	0.23	36.26	361	17.63	0.08
iBBB-	2,658	2,785	3	768	0.39	38.59	727	26.11	0.15
iBB+	3,530	3,633	4	626	0.66	42.39	1,398	38.48	0.28
iBB	4,137	4,233	3	454	1.12	48.53	2,360	55.77	0.54
iBB-	4,252	4,373	3	250	1.84	51.44	3,053	69.82	0.94
iB+	1,976	2,104	2	143	2.92	51.37	1,636	77.79	1.50
iB	2,293	2,373	4	86	4.26	48.15	1,784	75.19	2.05
iB-	1,358	1,389	0	31	7.52	48.24	1,120	80.62	3.62
iCCC+	607	623	0	16	12.89	47.03	580	93.09	6.05
iCCC	671	683	0	11	20.71	47.83	787	115.25	9.88
iCCC-	216	230	0	8	31.43	50.64	325	141.26	15.84
Total excluding default	26,421	28,391	38	5,019	2.57	44.21	14,407	50.74	1.24
Default	2,096	1,997	0	22	100.00	52.49	365	18.27	N/M
Total including default	28,517	30,388	39	5,041	2.57	44.21	14,771	50.74	1.24

N/M – Not meaningful

in € m.
(unless stated
otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	Average LGD in %	RWA	Average RW in %	EL/EAD in %
iAAA	27	104	0	35	0.03	18.63	5	5.20	0.01
iAA+	71	210	0	79	0.03	34.18	8	3.61	0.01
iAA	101	814	1	309	0.03	45.10	39	4.75	0.01
iAA-	334	491	0	63	0.04	18.43	32	6.42	0.02
iA+	85	109	1	88	0.05	23.27	4	3.83	0.01
iA	261	336	0	157	0.07	26.68	19	5.52	0.02
iA-	643	716	4	393	0.09	30.31	56	7.80	0.03
iBBB+	1,018	1,202	6	485	0.14	33.30	141	11.74	0.05
iBBB	1,845	1,882	9	621	0.23	36.19	337	17.89	0.08
iBBB-	2,823	2,899	3	601	0.39	44.61	848	29.24	0.18
iBB+	3,729	3,784	13	535	0.66	49.37	1,608	42.50	0.33
iBB	3,656	3,700	8	360	1.12	47.75	1,966	53.13	0.54
iBB-	3,097	3,143	3	255	1.87	50.14	2,098	66.76	0.93
iB+	1,428	1,477	3	106	2.92	49.59	1,078	72.98	1.45
iB	1,943	1,978	1	73	4.21	48.77	1,484	75.02	2.05
iB-	1,281	1,305	0	37	7.51	47.72	1,023	78.40	3.58
iCCC+	538	556	0	17	12.87	48.45	518	93.22	6.22
iCCC	561	575	0	10	19.00	48.46	637	110.66	9.19
iCCC-	181	187	0	5	31.00	51.64	255	136.75	16.01
Total excluding default	23,622	25,468	53	4,229	2.37	44.88	12,154	47.72	1.16
Default	2,478	2,415	0	19	100.00	46.17	185	7.67	N/M
Total including default	26,100	27,883	53	4,247	2.37	44.88	12,340	47.72	1.16

N/M – Not meaningful

¹ Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

The table below shows our Advanced IRBA exposure 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 and exposure volume is equal to or higher than €0.5 million. 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, 2016

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
Afghanistan									
EAD net	0	0	0	0	1	0	0	0	1
Average LGD in %	0	0	0	0	3.06	45.50	0	52.95	5.50
Average PD in %	0	0	0	0	1.07	6.80	0	3.17	1.22
American Virgin Islands									
EAD net	0	0	32	0	0	0	0	0	32
Average LGD in %	0	0	28.00	0	0	0	0	0	28.00
Average PD in %	0	0	0.69	0	0	0	0	0	0.69
Antigua and Barbados									
EAD net	0	0	0	0	0	0	1	0	2
Average LGD in %	0	0	3.80	0	0	20.60	100.00	56.90	65.14
Average PD in %	0	0	15.85	0	0	0.68	0.39	1.07	5.36
Argentina									
EAD net	111	0	214	0	2	1	0	5	333
Average LGD in %	50.00	0	38.67	11.22	15.09	42.29	55.67	19.75	42.06
Average PD in %	2.92	0	6.12	0.64	6.07	0.42	0.38	0.61	4.96
Australia									
EAD net	1,401	2,536	2,065	2	7	1	0	3	6,015
Average LGD in %	44.17	45.98	31.30	36.94	16.18	40.03	0	18.13	40.46
Average PD in %	0.01	0.58	5.78	0.39	4.78	1.21	0	2.20	2.24
Austria									
EAD net	207	286	781	8	41	3	2	10	1,338
Average LGD in %	23.74	36.71	36.42	8.24	13.37	41.78	54.37	23.47	33.60
Average PD in %	0.01	0.14	2.31	0.71	2.69	0.54	1.13	5.27	1.52
Barbados									
EAD net	0	0	286	0	0	0	0	0	286
Average LGD in %	0	0	21.29	0	0	26.08	0	0	21.29
Average PD in %	0	0	0.47	0	0	0.27	0	0	0.47
Belgium									
EAD net	639	829	1,801	1	35	2	2	8	3,317
Average LGD in %	47.12	34.99	31.67	10.38	16.65	43.19	54.81	33.57	35.33
Average PD in %	0	0.13	9.11	0.46	3.21	0.51	0.77	3.06	5.02
Bermuda									
EAD net	0	0	1,618	0	0	0	0	0	1,618
Average LGD in %	0	0	30.44	0	0	0	0	0	30.44
Average PD in %	0	0	7.41	0	0	0	0	0	7.41
Brazil									
EAD net	266	1,167	1,035	0	5	1	0	6	2,481
Average LGD in %	50.00	16.35	40.70	0	15.90	39.31	54.63	10.78	30.12
Average PD in %	0.64	0.65	4.83	0	4.32	0.87	0.60	1.68	2.41
British Virgin Islands									
EAD net	0	0	8,117	0	0	0	0	0	8,117
Average LGD in %	0	0	7.83	0	0	0	0	48.47	7.83
Average PD in %	0	0	2.60	0	0	0	0	1.44	2.60
Canada									
EAD net	555	2,262	3,011	1	5	1	0	12	5,846
Average LGD in %	40.41	28.81	37.46	6.11	17.16	40.79	55.67	13.99	34.33
Average PD in %	0.53	0.17	2.90	31.00	2.61	0.39	0.47	12.57	1.64

Dec 31, 2016									
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
Cape Verde									
EAD net	0	0	3.00	0	0	0	0	0	3.00
Average LGD in %	0	0	10.00	0	0	0	0	0	10.04
Average PD in %	0	0	0.64	0	0	0	0	0	0.64
Cayman Islands									
EAD net	0	0	6,195	0	0	0	0	0	6,195
Average LGD in %	0	0	30.76	0	5.20	45.50	0	39.93	30.75
Average PD in %	0	0	1.65	0	2.92	0.23	0	1.03	1.65
Chile									
EAD net	0	0	325	0	0	0	0	1	327
Average LGD in %	0	0	42.20	0	2.35	41.38	0	8.41	41.98
Average PD in %	0	0	0.44	0	0.36	1.38	0	2.10	0.45
China									
EAD net	3,759	5,633	5,589	0	17	1	1	1	15,002
Average LGD in %	50.32	51.02	34.51	0	14.62	42.96	55.67	56.61	44.66
Average PD in %	0	0.76	1.01	0	0.87	0.73	0.66	4.64	0.66
Colombia									
EAD net	0	0	71	0	1	0	0	1	74
Average LGD in %	0	0	44.99	0	13.31	40.52	0	20.62	44.00
Average PD in %	0	0	5.34	0	4.10	6.12	0	0.66	5.23
Czech Republic									
EAD net	485	222	160	0	4	0	1	3	875
Average LGD in %	50.00	44.20	43.94	0	23.10	40.99	55.67	38.78	47.26
Average PD in %	0	0.08	0.80	0	0.45	0.47	0.40	11.42	0.21
Denmark									
EAD net	57	551	1,198	4	10	0	0	3	1,824
Average LGD in %	46.64	46.99	36.42	5.20	13.64	43.19	0	25.87	39.72
Average PD in %	0	0.48	0.24	0.39	1.54	0.41	0	21.58	0.34
Finland									
EAD net	56	297	612	0	4	0	0	0	969
Average LGD in %	50.00	33.90	34.23	0	16.80	38.11	39.10	54.22	34.97
Average PD in %	0	0.27	0.23	0	1.79	0.89	1.22	3.66	0.23
France									
EAD net	1,012	4,915	5,396	4	56	5	3	84	11,474
Average LGD in %	49.71	34.29	37.95	9.25	12.91	42.65	53.00	15.63	37.13
Average PD in %	0	0.38	0.94	7.48	6.37	0.73	0.80	5.63	0.68
Germany									
EAD net	2,357	5,556	40,598	8,785	129,839	3,929	3,054	19,971	214,088
Average LGD in %	49.04	20.94	35.17	9.69	12.79	45.92	24.55	40.57	20.89
Average PD in %	0	12.18	3.99	2.38	2.34	1.19	2.02	5.34	3.14
Greece									
EAD net	0	13	1,551	0	5	1	0	3	1,573
Average LGD in %	0	27.59	23.17	0	15.96	41.28	39.10	18.41	23.18
Average PD in %	0	31.00	28.90	0	1.01	1.32	13.00	1.72	28.76
Guernsey									
EAD net	0	0	265	0	0	0	0	0	265
Average LGD in %	0	45.00	24.12	0	0	45.50	0	0	24.13
Average PD in %	0	0.04	5.04	0	0	0.07	0	0	5.04

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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
Hong Kong									
EAD net	323	684	4,290	0	10	0	0	1	5,308
Average LGD in %	30.00	44.97	29.72	8.75	23.05	41.13	39.10	29.24	31.69
Average PD in %	0.02	0.31	1.64	0.64	0.85	0.29	0.64	0.32	1.37
Hungary									
EAD net	95	6	159	0	3	0	0	2	267
Average LGD in %	50.00	36.68	39.13	0	20.23	43.01	0	45.58	42.81
Average PD in %	0.39	0.60	1.26	0	2.68	1.51	0	12.87	1.04
India									
EAD net	2,506	2,740	5,647	0	2	1	0	9	10,905
Average LGD in %	49.94	39.34	34.10	0	15.18	44.58	26.82	45.03	39.07
Average PD in %	0.39	0.49	4.25	0	0.56	2.73	1.76	2.63	2.42
Indonesia									
EAD net	894	0	1,657	0	1	0	0	1	2,553
Average LGD in %	50.00	0	38.27	0	15.76	42.40	0	19.62	42.37
Average PD in %	0.23	0	4.76	0	1.70	3.29	0	1.62	3.17
Ireland									
EAD net	1	377	6,401	0	26	0	0	2	6,810
Average LGD in %	50.00	16.79	19.79	26.87	11.25	38.91	6.63	17.33	19.60
Average PD in %	0.05	27.19	17.03	68.46	10.08	2.36	2.30	6.72	17.56
Israel									
EAD net	9	0	510	0	16	0	0	1	536
Average LGD in %	50.00	0	56.67	21.50	27.22	33.49	0	34.41	55.62
Average PD in %	0.05	0	0.61	0.23	4.79	1.01	0	5.63	0.73
Italy (incl. San Marino)									
EAD net	1,192	718	5,846	119	8,473	54	682	6,279	23,361
Average LGD in %	44.89	40.67	44.90	25.02	12.20	68.26	62.57	57.85	36.86
Average PD in %	0.18	1.36	9.88	18.90	4.50	3.95	10.47	14.35	8.43
Japan									
EAD net	6,243	1,495	2,329	0	8	1	0	0	10,075
Average LGD in %	5.91	44.56	32.82	0	20.53	40.05	55.67	41.09	17.88
Average PD in %	0	0.39	1.33	0	0.42	0.15	0.44	0.54	0.37
Jersey									
EAD net	0	0	1,482	0	0	0	0	0	1,482
Average LGD in %	0	0	22.79	0	0	0	0	0	22.79
Average PD in %	0	0	3.23	0	0	0	0	0	3.23
Luxembourg									
EAD net	11	734	11,295	0	38	0	0	2	12,082
Average LGD in %	50.00	47.37	22.92	7.09	10.47	42.74	41.70	45.64	24.40
Average PD in %	0	0.16	3.29	0.39	3.78	0.21	0.42	41.30	3.10
Malawi									
EAD net	0	0	1	0	0	0	0	0	1
Average LGD in %	0	0	10.00	0	0	0	0	0	10.48
Average PD in %	0	0	22.00	0	0	0	0	0	21.78
Malaysia									
EAD net	892	0	1,114	0	3	0	0	2	2,011
Average LGD in %	50.00	0	41.63	0	48.26	43.75	0	19.97	45.33
Average PD in %	0.07	0	0.92	0	5.89	2.00	0	19.54	0.57
Malta									
EAD net	1	15	196	0	2	0	0	0	214
Average LGD in %	49.36	34.74	10.98	0	20.08	45.83	0	74.86	13.02
Average PD in %	0.05	0.24	2.80	0	2.31	2.23	0	52.01	2.61

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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
Mauritius									
EAD net	0	0	168	0	1	0	0	0	169
Average LGD in %	0	0	35.58	0	16.04	45.50	0	56.47	35.51
Average PD in %	0	0	34.17	0	1.45	1.42	0	0.58	34.03
Mexico									
EAD net	0	94	831	1	4	1	0	49	979
Average LGD in %	0	46.13	38.69	5.40	12.45	41.44	55.67	65.49	40.61
Average PD in %	0	0.36	1.83	4.82	0.60	0.64	0.52	67.32	4.94
Netherlands									
EAD net	187	1,024	13,586	3	82	2	4	32	14,921
Average LGD in %	44.32	41.65	30.29	9.46	13.84	43.17	55.39	16.79	31.13
Average PD in %	0	0.26	6.30	2.41	2.02	0.54	0.66	1.44	5.77
New Zealand									
EAD net	0	0	578	0	2	0	0	0	580
Average LGD in %	0	0	27.05	0	12.33	44.85	39.10	10.69	26.99
Average PD in %	0	0	0.20	0	0.44	0.20	97.59	1.53	0.21
Nigeria									
EAD net	17	0	247	0	1	0	0	0	266
Average LGD in %	17.93	0	11.24	0	19.65	38.85	0	29.19	11.75
Average PD in %	1.07	0	14.67	0	1.75	2.21	0	3.35	13.73
Norway									
EAD net	11	289	1,387	0	16	0	0	1	1,704
Average LGD in %	50.00	28.73	12.88	0	15.88	42.35	0	64.45	15.86
Average PD in %	0	0.14	2.44	0	1.75	1.07	0	9.36	2.03
Pakistan									
EAD net	33	0	249	0	0	0	0	0	283
Average LGD in %	50.00	0	43.58	0	7.56	45.38	0	55.54	44.31
Average PD in %	7.95	0	5.78	0	0.39	3.88	0	2.74	6.02
Peru									
EAD net	4	0	312	0	0	0	0	4	320
Average LGD in %	99.26	0	44.93	0	5.40	39.36	55.67	5.21	45.12
Average PD in %	0.05	0	1.52	0	0.23	0.51	0.29	6.34	1.56
Philippines									
EAD net	424	0	445	0	1	0	1	0	871
Average LGD in %	49.18	0	34.66	0	20.92	41.19	55.67	47.11	41.73
Average PD in %	0.23	0	0.78	0	0.30	0.40	0.69	3.14	0.51
Poland									
EAD net	1,936	32	1,365	12	5,020	1	228	394	8,987
Average LGD in %	50.00	42.69	39.18	56.48	26.67	42.03	46.37	55.45	35.45
Average PD in %	0.05	0.26	5.63	3.02	2.02	2.99	5.40	9.21	2.54
Portugal									
EAD net	20	115	387	6	1,279	0	81	591	2,479
Average LGD in %	50.00	7.21	26.97	10.81	8.07	43.51	16.91	17.39	13.84
Average PD in %	0.64	11.78	8.94	8.30	5.23	0.60	10.10	9.87	7.35
Qatar									
EAD net	332	0	395	0	2	0	0	0	729
Average LGD in %	50.00	0	30.68	0	19.46	45.50	55.67	33.43	39.45
Average PD in %	0	0	0.44	0	2.44	0.15	0.61	19.13	0.24
Romania									
EAD net	2	3	30	0	1	0	0	1	37
Average LGD in %	50.00	34.35	50.33	0	13.98	43.89	55.67	32.13	48.00
Average PD in %	0.23	12.44	0.22	0	0.45	1.68	0.86	14.12	1.58
Russian Federation									
EAD net	559	0	887	0	32	1	0	9	1,488
Average LGD in %	50.00	0	30.22	0	18.85	40.73	3.57	12.93	37.30
Average PD in %	0.39	0	0.50	0	2.54	1.40	0.14	2.24	0.51

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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
Saudi Arabia									
EAD net	485	880	12,602	0	3	0	0	1	13,972
Average LGD in %	49.93	22.61	30.55	0	24.16	37.72	55.91	19.70	30.72
Average PD in %	0	0.18	0.35	0	0.34	0.63	0.60	0.56	0.32
Singapore									
EAD net	1,710	477	6,308	0	15	1	0	2	8,513
Average LGD in %	50.00	47.75	19.48	0	15.98	40.44	32.93	9.51	27.19
Average PD in %	0	0.36	2.04	0	0.48	0.36	0.45	0.22	1.54
Slovakia									
EAD net	8	3	30	0	1	0	0	0	42
Average LGD in %	50.00	45.00	44.78	0	17.34	35.83	55.67	54.76	45.31
Average PD in %	0.05	0.10	0.23	0	42.61	0.41	0.52	31.20	1.32
South Africa									
EAD net	21	89	389	0	5	1	0	7	513
Average LGD in %	50.00	43.97	50.14	5.40	16.42	37.64	55.67	13.40	48.15
Average PD in %	0.14	0.14	6.84	0.14	2.87	0.46	0.60	1.41	5.27
South Korea									
EAD net	2,050	14	6,613	0	2	0	0	0	8,680
Average LGD in %	50.76	32.79	35.91	0	23.37	45.65	0	51.46	39.41
Average PD in %	0	0.64	0.53	0	0.89	0.77	0	1.06	0.41
Spain									
EAD net	853	1,155	4,526	496	6,852	3	1,245	1,351	16,481
Average LGD in %	49.98	33.84	41.08	16.85	12.31	48.17	68.72	69.44	32.76
Average PD in %	0.93	0.27	10.37	9.83	3.50	0.71	7.33	14.55	6.41
Sri Lanka									
EAD net	130	0	117	0	0	0	0	0	247
Average LGD in %	50.00	0	46.86	0	23.40	42.10	0	56.28	48.51
Average PD in %	2.92	0	1.87	0	0.39	1.37	0	4.95	2.42
Sweden									
EAD net	2	633	1,349	0	16	1	1	1	2,002
Average LGD in %	30.00	24.41	40.61	0	21.16	41.75	56.25	49.39	35.33
Average PD in %	0.02	0.25	3.31	0	2.21	0.71	0.38	22.34	2.34
Switzerland									
EAD net	2,578	3,510	10,423	5	179	9	4	35	16,742
Average LGD in %	49.74	39.53	21.38	5.96	12.79	42.51	32.82	19.14	29.47
Average PD in %	0.05	0.07	5.69	0.94	3.59	0.72	1.32	5.37	3.62
Taiwan									
EAD net	668	0	1,525	0	0	0	0	8	2,202
Average LGD in %	50.00	0	40.03	0	19.62	40.51	55.67	3.04	42.92
Average PD in %	0	0	0.38	0	0.21	0.37	0.48	0.07	0.26
Thailand									
EAD net	662	0	1,309	0	2	0	0	1	1,975
Average LGD in %	50.00	0	43.13	0	13.88	40.85	55.67	14.18	45.39
Average PD in %	0.09	0	1.13	0	1.03	0.54	0.25	2.63	0.78
Turkey									
EAD net	92	0	2,684	0	4	1	0	2	2,783
Average LGD in %	49.99	0	20.40	5.20	17.28	44.04	55.67	45.08	21.41
Average PD in %	0.39	0	1.30	0.39	18.94	1.71	0.59	8.15	1.31
Ukraine									
EAD net	47	0	59	0	5	0	0	0	112
Average LGD in %	50.00	0	23.11	0	12.13	41.90	0	49.82	34.07
Average PD in %	13.00	0	67.79	0	0.37	1.50	0	6.99	41.36

Dec 31, 2016									
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
United Arab Emirates									
EAD net	173	0	1,331	0	16	1	0	12	1,533
Average LGD in %	50.00	0	31.82	21.50	17.90	42.71	0	39.41	33.78
Average PD in %	0	0	6.10	0.23	0.83	0.27	0	0.61	5.32
United Kingdom									
EAD net	564	8,407	18,833	2	178	4	3	451	28,443
Average LGD in %	50.00	62.04	32.77	6.48	15.31	35.74	53.30	14.24	41.36
Average PD in %	0	0.49	4.60	0.49	5.18	12.77	2.29	90.76	4.66
United States of America									
EAD net	97,519	17,608	94,436	0	69	4	4	907	210,547
Average LGD in %	4.09	36.17	23.26	18.57	14.90	44.71	51.68	48.36	15.57
Average PD in %	0	0.27	3.13	0.57	2.59	1.06	0.75	0.27	1.43
Uruguay									
EAD net	0	0	27	0	1	0	0	2	29
Average LGD in %	50.00	0	16.80	0	22.51	42.94	55.67	49.94	19.36
Average PD in %	0.39	0	6.70	0	16.44	0.22	0.23	0.14	6.41
Venezuela									
EAD net	83	0	27	0	2	0	0	8	121
Average LGD in %	2.82	0	7.18	0	12.88	37.08	0	6.16	4.23
Average PD in %	31.00	0	12.26	0	0.28	1.32	0	0.39	24.20
Vietnam									
EAD net	86	0	152	0	1	0	0	0	239
Average LGD in %	50.00	0	41.78	0	21.61	44.89	0	32.20	44.62
Average PD in %	1.07	0	1.58	0	0.64	1.03	0	0.89	1.39
Other									
EAD net	3,603	338	8,889	0	41	5	7	105	12,989
Average LGD in %	37.52	42.86	27.69	21.50	18.04	41.41	14.44	13.11	30.67
Average PD in %	1.25	3.65	6.25	1.07	4.31	2.53	0.45	10.97	4.83
thereof:									
International Organizations									
EAD net	1,861	53	47	0	0	0	0	0	1,960
Average LGD in %	47.24	69.46	45.00	0	0	0	0	0	47.79
Average PD in %	0.19	0.05	0.18	0	0	0	0	0	0.19
Total	142,294¹	65,709	314,343	9,450	152,444	4,040	5,327	30,388	723,997¹

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

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in € m. (unless stated otherwise)	Central governments and central banks	Institutions	Corporates	Retail secured by real estate SME	Retail secured by real estate non-SME	Retail qualifying revolving	Retail other SME	Retail other non-SME	Total
Afghanistan	0	0	0	0	0	0	0	0	0
EAD net	0	0	0	0	0	0	0	0	0
Average LGD in %	0	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0	0
American Virgin Islands									
EAD net	0	0	35	0	0	0	0	0	35
Average LGD in %	0	0	29.06	0	0	0	0	0	29.06
Average PD in %	0	0	0.73	0	0	0	0	0	0.73
Antigua and Barbados									
EAD net	0	0	0	0	0	0	0	0	0
Average LGD in %	0	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0	0
Argentina									
EAD net	77	0	189	0	3	1	0	8	278
Average LGD in %	50.00	0	34.84	11.92	11.97	41.47	0	31.81	38.70
Average PD in %	13.00	0	6.84	0.39	5.29	0.39	0	7.95	8.54
Australia									
EAD net	2,062	2,956	3,466	0	12	1	1	2	8,499
Average LGD in %	25.91	40.59	40.74	0	21.85	40.12	82.40	31.61	37.06
Average PD in %	0.01	0.07	1.25	0	3.37	0.82	13.00	4.57	0.54
Austria									
EAD net	230	321	927	17	36	3	0	11	1,545
Average LGD in %	44.23	31.57	35.11	7.61	14.42	41.61	27.95	27.88	34.91
Average PD in %	0.01	0.21	2.64	0.60	6.92	0.51	6.49	10.50	1.88
Barbados									
EAD net	0	0	241	0	0	0	0	0	241
Average LGD in %	0	0	25.81	0	0	26.16	0	0	25.81
Average PD in %	0	0	0.28	0	0	0.44	0	0	0.28
Belgium									
EAD net	599	1,208	2,651	1	38	2	0	9	4,509
Average LGD in %	50.00	43.78	37.49	10.80	16.96	42.84	22.74	41.05	40.66
Average PD in %	0	0.06	0.43	2.02	2.62	1.20	6.65	4.64	0.30
Bermuda									
EAD net	0	0	1,775	0	0	0	0	0	1,775
Average LGD in %	0	0	33.14	0	0	0	0	0	33.14
Average PD in %	0	0	3.54	0	0	0	0	0	3.54
Brazil									
EAD net	52	1,114	1,998	0	6	1	0	6	3,177
Average LGD in %	50.00	17.74	39.76	0	14.68	39.57	53.59	43.10	32.16
Average PD in %	0.39	0.42	2.26	0	1.71	0.34	0.39	15.30	1.61
British Virgin Islands									
EAD net	0	0	8,065	0	0	0	0	0	8,065
Average LGD in %	0	0	9.55	0	0	0	0	0	9.55
Average PD in %	0	0	3.29	0	0	0	0	0	3.29
Canada									
EAD net	756	2,793	3,892	1	6	1	0	13	7,461
Average LGD in %	30.44	27.21	36.52	11.95	14.73	40.88	5.04	14.06	32.36
Average PD in %	0.04	0.06	3.16	1.07	3.16	0.38	0.23	17.70	1.71

Dec 31, 2015									
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
Cape Verde									
EAD net	0	0	0	0	0	0	0	0	0
Average LGD in %	0	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0	0
Cayman Islands									
EAD net	0	0	7,965	0	0	0	0	1	7,966
Average LGD in %	0	0	30.25	0	5.20	45.43	39.10	49.91	30.25
Average PD in %	0	0	1.21	0	0.39	0.64	0.64	0.15	1.20
Chile									
EAD net	0	0	555	0	0	1	0	3	559
Average LGD in %	49.03	0	47.13	0	5.46	43.05	0	24.91	46.99
Average PD in %	0.02	0	0.72	0	0.43	0.21	0	2.57	0.73
China									
EAD net	2,741	5,112	5,416	0	16	1	0	5	13,291
Average LGD in %	50.93	40.93	37.60	29.28	14.28	42.77	0	50.06	41.60
Average PD in %	0	0.17	1.43	100.00	1.84	0.79	0	5.29	0.65
Colombia									
EAD net	0	0	166	0	2	0	0	2	170
Average LGD in %	0	0	36.73	0	12.82	39.23	56.81	49.74	36.67
Average PD in %	0	0	0.58	0	0.48	1.36	0.64	9.95	0.71
Czech Republic									
EAD net	433	388	231	0	4	0	0	3	1,059
Average LGD in %	50.00	44.41	42.01	0	11.39	40.28	0	28.81	46.01
Average PD in %	0	0.08	1.46	0	0.97	0.66	0	7.19	0.37
Denmark									
EAD net	82	1,899	919	4	12	0	0	3	2,920
Average LGD in %	47.98	15.05	41.59	5.20	15.02	42.62	0	23.31	24.33
Average PD in %	0	0.15	0.19	0.64	2.12	0.46	0	22.83	0.18
Finland									
EAD net	64	267	744	0	3	0	0	0	1,079
Average LGD in %	50.00	31.77	41.64	0	16.09	38.11	39.03	58.04	39.63
Average PD in %	0	0.04	0.24	0	1.24	0.43	1.76	7.53	0.18
France									
EAD net	939	6,112	5,842	4	65	5	0	87	13,054
Average LGD in %	49.00	22.71	41.33	26.22	12.81	42.59	18.44	16.18	32.85
Average PD in %	0	0.09	0.48	2.23	5.33	0.86	2.37	4.04	0.31
Germany									
EAD net	1,791	6,184	42,343	12,600	124,947	4,131	4,073	19,297	215,367
Average LGD in %	48.56	22.08	35.77	10.28	12.84	45.06	22.63	39.58	20.96
Average PD in %	0	0.42	4.04	2.45	2.57	1.24	1.94	5.36	2.98
Gibraltar									
EAD net	0	0	0	0	0	0	0	0	0
Average LGD in %	0	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0	0
Greece									
EAD net	0	18	1,394	0	6	1	0	2	1,421
Average LGD in %	0	33.48	18.36	0	12.78	41.69	0	30.95	18.56
Average PD in %	0	31.00	12.65	0	4.75	0.79	0	5.01	12.82
Guernsey									
EAD net	0	0	379	0	0	0	0	0	379
Average LGD in %	0	0	14.93	0	0	45.50	0	0	14.93
Average PD in %	0	0	1.87	0	0	0.23	0	0	1.87

Dec 31, 2015

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
Hong Kong									
EAD net	131	565	5,839	0	10	0	0	2	6,548
Average LGD in %	30.00	42.13	27.63	0	23.63	40.33	0	20.66	28.92
Average PD in %	0.02	0.06	1.08	0	1.62	0.42	0	0.52	0.97
Hungary									
EAD net	191	38	217	0	3	0	0	2	453
Average LGD in %	50.00	50.65	46.17	0	22.31	42.52	39.10	33.92	47.94
Average PD in %	0.39	0.41	1.47	0	0.80	2.05	0.23	5.59	0.94
India									
EAD net	1,406	3,126	6,188	0	3	1	0	9	10,733
Average LGD in %	49.51	43.78	38.28	0	11.08	42.73	38.53	46.97	41.36
Average PD in %	0.39	0.47	3.00	0	2.79	1.78	1.04	12.61	1.93
Indonesia									
EAD net	278	0	2,113	0	1	0	0	1	2,393
Average LGD in %	50.00	0	33.07	0	10.60	41.95	0	20.45	35.03
Average PD in %	0.23	0	3.54	0	0.89	0.84	0	2.37	3.15
Ireland									
EAD net	2	168	6,156	1	29	0	0	3	6,360
Average LGD in %	50.00	42.93	22.06	13.43	12.61	39.07	7.11	26.67	22.59
Average PD in %	0.05	0.63	20.31	1.90	8.55	0.79	1.73	1.73	19.71
Israel									
EAD net	11	0	484	0	16	1	0	1	511
Average LGD in %	50.00	0	53.10	21.50	26.48	33.66	0	17.70	52.14
Average PD in %	0.05	0	0.67	0.07	5.07	0.97	0	4.16	0.79
Italy (incl. San Marino)									
EAD net	1,953	896	6,314	310	7,157	2	1,361	4,048	22,040
Average LGD in %	47.04	25.02	39.60	19.65	7.82	41.37	23.89	75.06	34.61
Average PD in %	0.10	1.11	11.82	10.52	1.98	1.00	10.81	24.07	9.32
Japan									
EAD net	7,094	2,330	2,089	0	2	1	0	0	11,516
Average LGD in %	50.00	22.76	20.65	0	12.04	39.54	0	54.56	39.16
Average PD in %	0	0.08	0.53	0	0.53	0.18	0	3.82	0.11
Jersey									
EAD net	0	63	1,507	0	0	0	0	0	1,570
Average LGD in %	0	17.57	18.36	0	58.10	0	0	0	18.34
Average PD in %	0	0.04	2.43	0	100.00	0	0	0	2.35
Luxembourg									
EAD net	15	1,360	10,750	0	40	1	0	2	12,168
Average LGD in %	50.00	41.69	22.81	7.09	10.58	41.67	3.80	32.77	24.91
Average PD in %	0	0.28	2.72	0.64	8.71	3.67	1.02	29.88	2.47
Malawi									
EAD net	0	0	0	0	0	0	0	0	0
Average LGD in %	0	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0	0
Malaysia									
EAD net	115	0	997	0	4	0	0	2	1,118
Average LGD in %	46.15	0	44.32	0	49.84	42.71	0	19.31	44.48
Average PD in %	0.07	0	0.40	0	15.64	0.34	0	26.17	0.47
Malta									
EAD net	1	30	158	0	2	0	0	0	191
Average LGD in %	49.62	42.46	7.92	0	22.02	45.89	0	55.37	13.73
Average PD in %	0.05	0.07	1.26	0	7.18	1.19	0	2.27	1.12

Dec 31, 2015									
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
Mauritius									
EAD net	0	0	194	0	1	0	0	0	195
Average LGD in %	0	0	38.37	0	16.53	45.50	0	33.79	38.30
Average PD in %	0	0	1.53	0	2.37	2.35	0	2.42	1.54
Mexico									
EAD net	0	181	941	1	4	1	0	79	1,206
Average LGD in %	0	42.43	38.29	5.40	11.52	41.92	0	50.88	39.63
Average PD in %	0	0.21	2.08	2.92	0.82	0.56	0	48.50	4.82
Netherlands									
EAD net	170	1,588	11,385	3	79	2	0	13	13,241
Average LGD in %	46.49	42.84	30.47	11.16	14.27	42.68	22.40	19.36	32.05
Average PD in %	0.01	0.08	5.86	1.08	2.34	0.90	0.70	3.33	5.06
New Zealand									
EAD net	145	0	793	0	2	0	0	0	940
Average LGD in %	49.99	50.00	22.66	0	12.48	44.76	39.10	16.57	26.85
Average PD in %	0	1.76	0.10	0	0.72	0.15	98.17	8.69	0.09
Nigeria									
EAD net	12	0	424	0	1	0	0	1	439
Average LGD in %	26.89	0	30.09	0	23.51	41.85	0	82.98	30.17
Average PD in %	1.07	0	6.82	0	1.32	3.18	0	20.02	6.69
Norway									
EAD net	12	447	1,367	0	17	0	0	1	1,844
Average LGD in %	50.00	44.21	25.17	0	17.07	40.70	0	35.04	29.88
Average PD in %	0	0.04	0.67	0	2.76	1.14	0	6.31	0.53
Pakistan									
EAD net	48	0	206	0	1	0	0	2	257
Average LGD in %	50.00	0	28.64	0	9.24	45.39	0	47.35	32.74
Average PD in %	7.95	0	5.88	0	8.22	2.33	0	9.42	6.30
Peru									
EAD net	22	0	257	0	1	0	0	5	285
Average LGD in %	58.15	0	45.41	0	7.25	39.17	0	52.32	46.41
Average PD in %	0.05	0	0.74	0	0.40	0.64	0	10.14	0.86
Philippines									
EAD net	495	0	504	0	2	0	0	2	1,003
Average LGD in %	43.73	0	30.15	0	16.68	41.08	0	85.89	36.96
Average PD in %	0.23	0	0.56	0	0.31	0.31	0	11.87	0.42
Poland									
EAD net	1,565	80	1,248	7	5,288	1	243	333	8,765
Average LGD in %	50.00	35.35	40.79	33.49	29.76	41.59	58.47	56.76	36.82
Average PD in %	0.05	0.32	7.67	2.30	1.92	2.91	5.72	12.31	2.89
Portugal									
EAD net	5	69	540	7	1,360	0	104	467	2,551
Average LGD in %	50.00	41.70	37.37	13.50	9.40	42.34	22.86	17.45	18.30
Average PD in %	0.64	2.64	7.18	9.83	5.59	0.46	15.10	11.96	7.41
Qatar									
EAD net	459	0	521	0	2	0	0	0	982
Average LGD in %	50.00	0	27.83	0	21.39	41.90	0	33.23	38.19
Average PD in %	0	0	1.02	0	1.40	0.14	0	3.69	0.54
Romania									
EAD net	0	2	21	0	3	0	0	28	55
Average LGD in %	0	19.98	49.57	0	8.16	43.72	0	84.29	63.25
Average PD in %	0	9.69	0.16	0	6.44	1.35	0	21.33	11.60
Russian Federation									
EAD net	256	0	836	0	39	2	0	25	1,158
Average LGD in %	50.00	0	43.95	0	20.76	29.34	47.44	8.49	43.71
Average PD in %	0.39	0	0.58	0	1.42	1.19	0.23	1.23	0.58

Dec 31, 2015

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
Saudi Arabia									
EAD net	235	906	2,198	0	3	0	0	2	3,344
Average LGD in %	49.88	32.98	26.64	0	26.84	37.43	0	12.77	29.99
Average PD in %	0	0.07	1.48	0	0.41	0.91	0	3.57	1.00
Singapore									
EAD net	1,244	142	6,682	0	15	1	0	2	8,086
Average LGD in %	50.00	41.49	22.08	0	16.17	40.32	39.10	7.71	26.70
Average PD in %	0	0.04	1.73	0	0.83	0.53	0.14	0.66	1.44
Slovakia									
EAD net	0	0	0	0	0	0	0	0	0
Average LGD in %	0	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0	0
South Africa									
EAD net	30	224	311	0	6	1	0	7	579
Average LGD in %	50.00	45.25	49.71	5.40	13.84	37.00	0	28.27	47.32
Average PD in %	0.09	0.12	2.40	0.09	4.85	0.61	0	0.61	1.40
South Korea									
EAD net	1,698	11	3,660	0	2	0	0	0	5,371
Average LGD in %	52.51	49.62	41.56	0	16.56	44.17	0	51.21	45.03
Average PD in %	0	0.64	0.27	0	1.76	0.82	0	6.47	0.19
Spain									
EAD net	974	461	5,618	512	7,149	4	1,177	1,252	17,147
Average LGD in %	50.12	38.48	36.58	14.07	13.38	44.73	53.63	61.26	30.03
Average PD in %	0.91	0.34	14.76	9.39	4.05	0.79	8.00	16.76	8.64
Sri Lanka									
EAD net	56	0	112	0	0	0	0	4	172
Average LGD in %	50.00	0	46.97	0	23.40	41.78	0	86.03	48.76
Average PD in %	2.92	0	1.47	0	0.39	0.66	0	15.79	2.24
Sweden									
EAD net	2	953	989	0	15	1	0	2	1,962
Average LGD in %	30.00	38.05	37.87	0	22.53	42.58	81.51	24.61	37.83
Average PD in %	0.03	0.07	0.69	0	1.31	2.22	0.23	12.07	0.40
Switzerland									
EAD net	10,104	2,235	10,669	5	189	10	2	49	23,262
Average LGD in %	49.85	31.30	21.37	5.08	13.29	42.10	16.85	26.08	34.65
Average PD in %	0	0.11	1.24	0.71	2.53	0.71	0.73	6.23	0.61
Taiwan									
EAD net	744	0	1,251	0	0	0	0	6	2,002
Average LGD in %	30.67	0	38.06	0	8.00	40.43	0	2.33	35.20
Average PD in %	0	0	0.29	0	0.23	0.26	0	0.21	0.18
Thailand									
EAD net	710	0	1,398	0	2	0	0	1	2,111
Average LGD in %	50.00	0	35.65	0	15.91	40.94	0	17.27	40.46
Average PD in %	0.09	0	0.54	0	0.97	0.30	0	4.30	0.39
Turkey									
EAD net	158	0	2,981	0	4	1	0	2	3,146
Average LGD in %	50.00	0	19.56	5.20	16.64	43.33	0	49.40	21.11
Average PD in %	0.39	0	1.39	0.14	18.29	3.71	0	13.41	1.37
Ukraine									
EAD net	36	0	133	0	6	0	0	2	177
Average LGD in %	50.00	0	37.85	0	13.02	41.42	0	83.73	40.10
Average PD in %	13.00	0	15.71	0	0.29	4.12	0	14.33	14.63

Dec 31, 2015									
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
United Arab Emirates									
EAD net	172	0	2,266	1	16	1	0	15	2,470
Average LGD in %	50.00	0	35.53	21.50	20.55	43.39	0	32.62	36.42
Average PD in %	0	0	3.04	0.45	0.94	0.48	0	0.48	2.80
United Kingdom									
EAD net	435	3,456	19,876	4	210	4	0	662	24,647
Average LGD in %	50.00	42.13	32.23	6.30	18.40	39.76	15.57	14.33	33.32
Average PD in %	0	0.54	0.93	0.44	10.44	1.04	1.52	94.02	3.45
United States of America									
EAD net	50,393	13,026	97,156	0	77	4	1	1,218	161,875
Average LGD in %	48.35	37.26	25.43	16.47	24.20	44.28	46.64	46.88	33.68
Average PD in %	0	0.23	2.36	1.18	3.02	0.59	17.31	0.29	1.44
Uruguay									
EAD net	0	0	20	0	0	0	0	2	22
Average LGD in %	50.00	0	11.86	0	10.44	42.96	0	53.01	16.01
Average PD in %	0.23	0	7.97	0	0.59	0.16	0	0.49	7.05
Venezuela									
EAD net	114	0	54	0	4	0	0	10	181
Average LGD in %	2.27	0	10.11	0	13.87	34.25	43.40	19.62	5.78
Average PD in %	13.00	0	7.99	0	1.70	0.32	0.15	3.79	10.78
Vietnam									
EAD net	39	0	128	0	2	0	0	0	169
Average LGD in %	50.00	0	44.86	0	20.73	44.39	0	36.49	45.80
Average PD in %	1.07	0	2.68	0	0.18	0.66	0	3.65	2.28
Other									
EAD net	4,753	708	7,480	0	58	5	1	169	13,175
Average LGD in %	44.26	37.95	23.15	0	15.13	39.88	37.59	35.31	31.68
Average PD in %	0.25	8.93	5.32	0	5.88	2.05	1.54	10.11	3.75
thereof:									
International Organizations									
EAD net	3,000	313	96	0	0	0	0	0	3,409
Average LGD in %	48.00	52.27	45.00	0	0	0	0	84.11	48.31
Average PD in %	0.01	0.01	0.10	0	0	0	0	94.11	0.01
Total	99,809	61,435	314,225	13,479	146,980	4,194	6,965	27,884	674,971

The overall increase is predominantly driven by higher exposures in interest earning deposits with central banks in the United States of America in the exposure class "Central governments and central banks". The increase in Saudi Arabia in the exposure class "Corporates" is to high extent resulting from changes in the application of netting rules for Security Financing transactions. The decrease in Switzerland and the exposure class "Central governments and central banks" is predominantly driven by lower interest earning deposits with the Swiss National Bank.

Foundation Internal Ratings – Model Validation

We regularly validate our rating methodologies and credit risk parameters at Postbank. Whereas the rating methodology validation focuses on the discriminatory power of the models, the risk parameter validation for PD analyzes its predictive power when compared against historical default experiences.

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

	2016		2015	
	Count	EAD in %	Count	EAD in %
Appropriate	1	100.0	1	100.0
Overly conservative	0	0.0	0	0.0
Progressive	0	0.0	0	0.0
Total	1	100.0	1	100.0
Thereof already recalibrated and introduced	in 2016		in 2015	
Overly conservative	0	0.0	0	0.0
Progressive	0	0.0	0	0.0
Total	0	0.0	0	0.0

Above table summarizes the outcome of the model validations for the risk parameter PD used in our foundation IRBA for Postbank. 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, 2016 and as of December 31, 2015. The validation classifies the PD parameter settings for the foundation IRBA relevant rating system of Postbank as appropriate.

The following table shows our undrawn commitment exposure treated within the advanced IRBA. It is broken down by regulatory exposure class and also provides the corresponding exposure-weighted credit conversion factors and resulting EADs. 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.

Undrawn commitment exposure within the advanced IRBA by regulatory exposure class

in € m. unless stated otherwise	Dec 31, 2016			Dec 31, 2015		
	Undrawn commitments	Weighted Credit Conversion Factor (CCF) in %	Exposure value for undrawn commitments (EAD)	Undrawn commitments	Weighted Credit Conversion Factor (CCF) in %	Exposure value for undrawn commitments (EAD)
Central governments and central banks	909	94	854	1,526	93	1,412
Institutions	3,071	38	1,162	2,038	36	734
Corporates	195,885	30	59,284	201,370	31	62,871
Retail	20,833	65	13,459	20,373	64	13,051
thereof:						
Secured by real estate SME	280	53	148	504	52	264
Secured by real estate non-SME	6,994	85	5,943	6,213	81	5,027
Qualifying revolving	5,405	64	3,470	5,507	65	3,599
Other SME	3,463	39	1,334	4,317	46	1,994
Other non-SME	4,691	55	2,566	3,832	57	2,167
Total EAD of undrawn commitments in the advanced IRBA	220,698	34	74,759	225,307	35	78,068

A year-on-year comparison shows a slight decrease mainly driven by the corporates exposure resulting from reductions in business volumes.

Exposures with regulatory defined risk weights

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

The table below shows our equity exposures under the simple risk weight approach.

EAD of equity investments by risk weight

in €m.		Dec 31, 2016	Dec 31, 2015
Risk Position	Risk Weight		
Private equity exposures in sufficiently diversified portfolios	190 %	120	137
Exchange traded equity exposures	290 %	153	104
Other equity exposures	370 %	1,114	2,668
Total EAD of equity investments (IRBA simple risk-weight approach)		1,387	2,909

The decrease in other equity exposures predominantly reflects the sale of our Abbey Life stake.

The following table presents the exposures assigned to the exposure class “other non-credit obligation assets”, to financial sector entities (FSE) and to deferred tax assets (DTA). FSE represent positions of significant investments in CET 1 instruments of financial sector entities which are subject to the threshold exemptions as outlined in Article 48 CRR. DTA are 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.

EAD of other non-credit obligation assets, DTA and FSE by risk weight

in €m.		Dec 31, 2016	Dec 31, 2015
Risk Position	Risk Weight		
Other non-credit obligation assets - cash	0 %	2,526	2,126
Other non-credit obligation assets - other	100 %	3,422	3,427
DTA and FSE	250 %	5,227	6,882
Total EAD other non-credit obligation assets, DTA and FSE		11,175	12,435

The decrease in DTA and FSE predominantly reflects the sale of our Hua Xia stake.

Foundation IRBA Exposure

Within the Postbank portfolios we assign our exposures to the relevant regulatory exposure class by taking into account factors like customer-specific characteristics and the rating system used. The following tables also consider Postbank's counterparty credit risk position resulting from derivatives and SFTs as far as they are assigned to the foundation IRBA.

The tables below show our foundation IRBA exposures for institutions and corporates, distributed on our internal rating scale, showing also the PD range for each grade. For yearend 2016 and 2015 we do not report any exposure for central governments and central banks. The internal rating grades take into account the respective external Standard & Poor's rating grade equivalents. The EAD net is presented in conjunction with risk-weighted assets calculated and the average RW. The information is shown after credit risk mitigation obtained in the form of financial, physical and other collateral as well as guarantees and credit derivatives.

EAD for Foundation IRBA credit exposures by PD grade for institutions

in € m.

(unless stated otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	RWA	Average RW in %
iAAA	0	0	0	0	0.00	0	0.00
iAA+	0	0	0	0	0.00	0	0.00
iAA	0	0	0	0	0.03	0	19.05
iAA-	0	0	0	0	0.00	0	0.00
iA+	0	0	0	0	0.00	0	0.00
iA	0	0	0	0	0.06	0	27.29
iA-	0	0	0	0	0.11	0	41.10
iBBB+	0	0	0	0	0.15	0	65.95
iBBB	0	0	0	0	0.23	0	78.33
iBBB-	0	0	0	0	0.38	0	93.06
iBB+	0	0	0	0	0.69	0	104.94
iBB	0	0	0	0	0.00	0	0.00
iBB-	0	0	0	0	0.00	0	0.00
iB+	0	0	0	0	0.00	0	0.00
iB	0	0	0	0	0.00	0	0.00
iB-	0	0	0	0	0.00	0	0.00
iCCC+	0	0	0	3	0.00	0	0.00
iCCC	2	2	0	0	20.00	6	286.68
iCCC-	0	0	0	0	0.00	0	0.00
Total excluding default	2	2	0	4	16.35	6	245.00
Default	0	0	0	0	0.00	0	N/M
Total including default	2	2	0	4	16.35	6	245.00

N/M – Not meaningful

in € m.
(unless stated otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	RWA	Average RW in %
iAAA	0	0	0	0	0.00	0	0.00
iAA+	0	0	0	0	0.00	0	0.00
iAA	0	0	0	0	0.00	0	0.00
iAA-	0	0	0	0	0.00	0	0.00
iA+	0	0	0	0	0.00	0	0.00
iA	0	0	0	0	0.00	0	0.00
iA-	0	0	0	0	0.00	0	0.00
iBBB+	0	0	0	0	0.00	0	0.00
iBBB	0	0	0	0	0.00	0	0.00
iBBB-	0	0	0	0	0.00	0	0.00
iBB+	0	0	0	0	0.00	0	0.00
iBB	0	0	0	0	0.00	0	0.00
iBB-	0	0	0	0	0.00	0	0.00
iB+	0	0	0	0	0.00	0	0.00
iB	0	0	0	0	0.00	0	0.00
iB-	0	0	0	0	0.00	0	0.00
iCCC+	0	0	0	0	0.00	0	0.00
iCCC	2	2	0	0	18.00	4	246.68
iCCC-	0	0	0	0	0.00	0	0.00
Total excluding default	2	2	0	1	18.00	4	246.68
Default	0	0	0	0	0.00	0	N/M
Total including default	2	2	0	1	18.00	4	246.68

N/M – Not meaningful

¹ Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

EAD net for Foundation IRBA credit exposures by PD grade for corporates

in € m.
(unless stated otherwise)

Dec 31, 2016

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments	Average PD in %	RWA	Average RW in %
iAAA	0	0	0	0	0.00	0	0.00
iAA+	0	0	0	0	0.00	0	0.00
iAA	2,065	2,065	0	925	0.03	217	10.50
iAA-	2	594	0	3	0.04	55	9.23
iA+	0	0	0	0	0.00	0	0.00
iA	41	40	0	33	0.06	7	16.89
iA-	293	278	3	121	0.09	62	22.18
iBBB+	1,112	992	7	341	0.15	256	25.76
iBBB	916	868	29	596	0.23	383	44.10
iBBB-	1,098	941	22	506	0.38	436	46.35
iBB+	740	595	59	260	0.69	371	62.42
iBB	227	174	3	110	1.23	102	58.49
iBB-	97	70	0	61	2.06	56	80.53
iB+	0	0	0	0	0.00	0	0.00
iB	12	10	0	9	3.78	13	124.34
iB-	25	22	1	11	7.26	34	155.35
iCCC+	10	9	0	2	12.76	21	221.22
iCCC	93	92	0	131	20.00	234	254.33
iCCC-	1	1	0	0	45.00	3	286.69
Total excluding default	6,732	6,751	124	3,108	0.56	2,248	33.31
Default	49	49	0	7	100.00	0	N/M
Total including default	6,782	6,800	124	3,116	1.29	2,248	33.06

N/M – Not meaningful

in € m.

(unless stated otherwise)

Dec 31, 2015

Internal rating	EAD gross	EAD net	EAD net thereof counterparty credit risk	Undrawn commitments ¹	Average PD in %	RWA	Average RW in %
iAAA	0	0	0	0	0.00	0	0.00
iAA+	0	0	0	0	0.00	0	0.00
iAA	412	2,018	0	936	0.03	206	10.19
iAA-	2	713	0	5	0.04	84	11.78
iA+	0	0	0	0	0.00	0	0.00
iA	46	42	0	32	0.06	7	16.63
iA-	185	196	0	102	0.09	34	17.56
iBBB+	1,054	767	8	359	0.15	194	25.30
iBBB	1,441	995	30	595	0.23	411	41.28
iBBB-	996	644	23	385	0.38	364	56.55
iBB+	1,073	565	52	249	0.69	356	63.11
iBB	623	189	6	129	1.23	124	65.87
iBB-	258	85	3	61	2.06	68	79.90
iB+	7	0	0	0	0.00	0	0.00
iB	80	31	1	36	3.78	36	115.35
iB-	58	40	8	6	7.26	55	138.55
iCCC+	3	0	0	0	12.76	0	60.70
iCCC	31	30	2	56	19.26	63	211.78
iCCC-	40	40	0	0	61.25	27	66.33
Total excluding default	6,308	6,355	134	2,950	0.78	2,030	31.43
Default	66	58	1	11	100.00	0	N/M
Total including default	6,375	6,413	134	2,962	1.68	2,030	31.65

N/M – Not meaningful

¹ Comparatives have been restated to reflect Postbanks undrawn commitments pre credit conversion factors (CCF).

The table below shows our Foundation IRBA exposure 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 and exposure volume is equal to or higher than €0.5 million. 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 (including derivatives and SFTs)

in € m. (unless stated otherwise)	Dec 31, 2016				Dec 31, 2015			
	Central governments and central banks	Institutions	Corporates	Total	Central governments and central banks	Institutions	Corporates	Total
Argentina								
EAD net	0	0	10	10	0	0	10	10
Average PD in %	0	0	17.27	17.27	0	0	11.08	11.08
Australia								
EAD net	0	0	5	5	0	0	4	4
Average PD in %	0	0	0.23	0.23	0	0	0.20	0.20
Austria								
EAD net	0	0	261	261	0	0	243	243
Average PD in %	0	0	0.15	0.15	0	0	0.18	0.18
Belgium								
EAD net	0	0	83	83	0	0	95	95
Average PD in %	0	0	0.14	0.14	0	0	0.13	0.13
Brazil								
EAD net	0	0	11	11	0	0	11	11
Average PD in %	0	0	9.94	9.94	0	0	4.27	4.27
Canada								
EAD net	0	0	4	4	0	0	1	1
Average PD in %	0	0	0.35	0.35	0	0	0.35	0.35
Chile								
EAD net	0	0	5	5	0	0	3	3
Average PD in %	0	0	8.20	8.20	0	0	1.40	1.40
China								
EAD net	0	0	7	7	0	0	5	5
Average PD in %	0	0	4.57	4.57	0	0	0.63	0.63
Colombia								
EAD net	0	0	3	3	0	0	4	4
Average PD in %	0	0	4.30	4.30	0	0	0.14	0.14
Czech Republic								
EAD net	0	0	18	18	0	0	25	25
Average PD in %	0	0	0.21	0.21	0	0	0.16	0.16
Denmark								
EAD net	0	0	17	17	0	0	19	19
Average PD in %	0	0	0.14	0.14	0	0	0.40	0.40
Finland								
EAD net	0	0	7	7	0	0	12	12
Average PD in %	0	0	0.11	0.11	0	0	0.10	0.10
France								
EAD net	0	0	197	197	0	0	187	187
Average PD in %	0	0	0.19	0.19	0	0	0.18	0.18
Germany								
EAD net	0	2	5,196	5,198	0	2	4,866	4,868
Average PD in %	0	16.36	1.39	1.40	0	18.00	1.57	1.59
Gibraltar								
EAD net	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0
Greece								
EAD net	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0
Hong Kong								
EAD net	0	0	3	3	0	0	4	4
Average PD in %	0	0	0.27	0.27	0	0	0.16	0.16
Hungary								
EAD net	0	0	41	41	0	0	19	19
Average PD in %	0	0	0.16	0.16	0	0	0.18	0.18

in € m. (unless stated otherwise)	Dec 31, 2016				Dec 31, 2015			
	Central governments and central banks	Institutions	Corporates	Total	Central governments and central banks	Institutions	Corporates	Total
Romania								
EAD net	0	0	11	11	0	0	0	0
Average PD in %	0	0	0.19	0.19	0	0	0	0
Singapore								
EAD net	0	0	3	3	0	0	2	2
Average PD in %	0	0	0.28	0.28	0	0	0.18	0.18
Slovakia								
EAD net	0	0	14	14	0	0	12	12
Average PD in %	0	0	0.16	0.16	0	0	0.19	0.19
South Africa								
EAD net	0	0	5	5	0	0	2	2
Average PD in %	0	0	0.19	0.19	0	0	0.17	0.17
South Korea								
EAD net	0	0	6	6	0	0	3	3
Average PD in %	0	0	0.32	0.32	0	0	0.26	0.26
Spain								
EAD net	0	0	51	51	0	0	86	86
Average PD in %	0	0	0.24	0.24	0	0	0.18	0.18
Sweden								
EAD net	0	0	22	22	0	0	27	27
Average PD in %	0	0	1.38	1.38	0	0	0.13	0.13
Switzerland								
EAD net	0	0	88	88	0	0	64	64
Average PD in %	0	0	0.73	0.73	0	0	0.28	0.28
Taiwan								
EAD net	0	0	2	2	0	0	1	1
Average PD in %	0	0	0.34	0.34	0	0	0.14	0.14
Thailand								
EAD net	0	0	2	2	0	0	2	2
Average PD in %	0	0	0.22	0.22	0	0	0.23	0.23
Turkey								
EAD net	0	0	5	5	0	0	5	5
Average PD in %	0	0	0.42	0.42	0	0	0.38	0.38
United Arab Emirates								
EAD net	0	0	1	1	0	0	1	1
Average PD in %	0	0	0.15	0.15	0	0	0.21	0.21
United Kingdom								
EAD net	0	0	194	194	0	0	198	198
Average PD in %	0	0	0.36	0.36	0	0	0.32	0.32
United States of America								
EAD net	0	0	53	53	0	0	72	72
Average PD in %	0	0	0.45	0.45	0	0	0.31	0.31
Uruguay								
EAD net	0	0	4	4	0	0	4	4
Average PD in %	0	0	30.80	30.80	0	0	35.21	35.21
Other								
EAD	0	0	52	53	0	0	35	35
Average PD in %	0	0	4.53	4.44	0	0	5.45	5.45
thereof:								
International Organizations								
EAD	0	0	0	0	0	0	0	0
Average PD in %	0	0	0	0	0	0	0	0
Total	0	2	6,800	6,803	0	2	6,413	6,415

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

Exposure for specialized lending by risk weight

in € m.			Dec 31, 2016	Dec 31, 2015
Risk weight category	Remaining maturity	Risk weight		
1 (strong)	< 2.5 years	50 %	119	375
1 (strong)	≥ 2.5 years	70 %	2,496	2,470
2 (good)	< 2.5 years	70 %	208	134
2 (good)	≥ 2.5 years	90 %	1,261	802
3 (satisfactory)	< 2.5 years	115 %	124	265
3 (satisfactory)	≥ 2.5 years	115 %	78	157
4 (weak)	< 2.5 years	250 %	10	2
4 (weak)	≥ 2.5 years	250 %	30	9
5 (defaulted)	< 2.5 years	0 %	29	43
5 (defaulted)	≥ 2.5 years	0 %	2	49
Total EAD of specialized lending			4,358	4,305

Standardized Approach exposure by risk weight before and after credit mitigation

The table below shows exposure values in the standardized approach broken down by risk weight before and after credit risk mitigation obtained in the form of eligible financial collateral, guarantees and credit derivatives. Securitization positions in the regulatory banking book and Postbank's CIU exposures assigned to the standardized approach are excluded. Postbank CIUs exposure is displayed in the table "EAD of CIUs of Postbank in the Standardized Approach by Risk Weight".

Exposure values in the standardized approach by risk weight

in € m.	Risk weight	Dec 31, 2016		Dec 31, 2015	
		Before credit risk mitigation	After credit risk mitigation	Before credit risk mitigation	After credit risk mitigation
	0 %	142,702	142,776	112,461	113,021
	2 %	22,806	22,486	27,466	27,212
	4 %	0	0	0	0
	10 %	0	0	0	0
	20 %	783	809	1,603	1,656
	35 %	2,711	2,711	3,959	3,958
	50 %	746	707	1,904	1,847
	70 %	0	0	0	0
	75 %	4,718	4,669	7,179	6,442
	100 %	13,703	10,227	17,420	13,016
	150 %	1,118	1,085	1,959	1,869
Total EAD in the standardized approach		189,287	185,470	173,949	169,021

The slight increase in EAD is predominantly driven by additional exposure in interest earning deposits with central banks partially offset by reductions across the remaining risk weights reflecting our de-risking activities.

Regulatory Application of Credit Risk Mitigation Techniques

The following section summarizes the value of credit risk mitigation exposures in form of financial and personal collateral. The tables are shown for the advanced IRBA, the foundation IRBA and the standardized approach. Details regarding the general approach for applying regulatory credit risk mitigations are outlined in the section "risk quantification and measurement".

The table below shows the advanced IRBA exposures before credit risk mitigation in conjunction with the proportional amounts for eligible advanced IRBA collateral as well as guarantees and credit derivatives.

Collateralized credit risk exposure in the Advanced IRBA by exposure class

in € m.	Dec 31, 2016				Dec 31, 2015			
	Total EAD	Eligible advanced IRBA collateral	Guarantees and credit derivatives	Total EAD collateralized ¹	Total EAD	Eligible advanced IRBA collateral	Guarantees and credit derivatives	Total EAD collateralized ¹
Central governments and central banks	134,368	1,012	2,338	3,350	93,253	1,440	2,498	3,938
Institutions	61,056	10,895	1,340	12,236	59,744	12,497	1,986	14,483
Corporates	327,795	82,459	24,918	107,377	323,512	78,121	23,953	102,074
thereof:								
SMEs	12,629	4,198	928	5,126	10,093	3,230	624	3,854
Specialized Lending	6,376	5,526	0	5,526	5,363	4,590	0	4,590
Other	308,789	72,735	23,990	96,725	308,057	70,301	23,329	93,630
Retail	200,686	139,820	1,138	140,957	198,376	138,655	824	139,479
thereof:								
Secured by real estate SME	9,546	7,275	95	7,371	13,542	9,952	63	10,015
Secured by real estate non-SME	152,590	127,693	146	127,838	147,093	123,643	112	123,755
Qualifying revolving	4,040	16	0	16	4,194	100	0	100
Other SME	5,993	1,336	682	2,017	7,428	1,691	482	2,173
Other non-SME	28,517	3,500	215	3,715	26,118	3,269	167	3,436
Total	723,904²	234,186	29,734	263,920	674,885²	230,713	29,262	259,975

¹ Excludes collateralization which is reflected in the EPE measure.

² Includes exposure subject to dilution risk of €2.5 billion per year end 2016 and €2.8 billion per year end 2015.

The increase in EAD is predominantly driven by Central governments and central banks. This reflects to high extent higher volumes in interest earning deposits with the Federal Reserve Bank of New York.

The following table provides the Foundation IRBA exposures before credit risk mitigation in conjunction with the proportional amounts for financial and other collateral as well as guarantees and credit derivatives.

Collateralized credit risk exposure in the Foundation IRBA by exposure class

in € m.	Dec 31, 2016				
	Total EAD	Financial collateral	Other collateral	Guarantees and credit derivatives	Total EAD collateralized
Central governments and central banks	0	0	0	0	0
Institutions	2	0	0	0	0
Corporates	6,782	0	0	573	573
thereof:					
SMEs	227	0	0	3	3
Specialized Lending	0	0	0	0	0
Other	6,555	0	0	571	571
Total	6,784¹	0	0	573	573

¹ Includes exposure subject to dilution risk of €2.2 billion per year end 2016.

in € m.	Dec 31, 2015				
	Total EAD	Financial collateral	Other collateral	Guarantees and credit derivatives	Total EAD collateralized
Central governments and central banks	0	0	0	0	0
Institutions	2	0	0	0	0
Corporates	6,375	0	0	693	693
thereof:					
SMEs	273	0	0	50	50
Specialized Lending	0	0	0	0	0
Other	6,102	0	0	643	643
Total	6,377¹	0	0	693	693

¹ Includes exposure subject to dilution risk of €2.4 billion per year end 2015.

The table below shows the standard approach exposures, financial collateral and guarantees and credit derivatives by exposure class.

Exposure values in the standardized approach by exposure class

in € m.	Dec 31, 2016				Dec 31, 2015			
	Total EAD	Financial collateral	Guarantees and credit derivatives	Total EAD collateralized	Total EAD	Financial collateral	Guarantees and credit derivatives	Total EAD collateralized
Central governments or central banks	112,836	1	0	1	71,726	0	226	226
Regional governments and local authorities	14,111	3	22	25	18,639	2	6	8
Public sector entities	7,687	0	0	0	12,387	0	329	329
Multilateral development banks	6,331	0	0	0	7,111	0	0	0
International organizations	1,595	0	0	0	3,609	0	0	0
Institutions	22,526	368	9	377	27,982	271	45	316
Corporates	11,734	3,280	93	3,372	13,989	3,685	63	3,747
Retail	4,718	35	11	45	7,179	107	0	107
Secured by mortgages on immovable property	3,312	5	0	5	5,837	77	0	77
Exposures in default	1,544	21	0	21	2,853	115	0	115
Items associated with particular high risk	46	5	0	5	213	4	0	4
Covered bonds	0	0	0	0	0	0	0	0
Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	0	0
Collective investment undertakings (CIU)	0	0	0	0	0	0	0	0
Equity	1,057	0	0	0	1,541	0	0	0
Other items	1,791	0	0	0	884	0	0	0
Total	189,287	3,716	134	3,850	173,949	4,259	669	4,928

The increase in EAD is predominantly resulting from higher positions in interest earning deposits with central banks. That is partially offset by reductions across the remaining exposure classes reflecting our de-risking activities.

Counterparty Credit Risk

Counterparty Credit Risk (CCR) is defined as the risk that the counterparty could default before the final settlement of the cash flows of derivatives or securities financing transactions. We calculate the exposure to CCR using the internal model method (IMM) and the mark-to-market method.

The following table presents our CCR exposure by product type and calculation method applied. Under the mark to market method the positive market values before netting and collateral, the potential future exposure and the exposure at default are shown. Under the IMM only the exposure at default is presented. Given the nature of the internal model the simulation process of futures market values across all asset classes is including the impact from regulatory netting and collateralization.

Counterparty credit risk exposures by calculation method

	Dec 31, 2016				
in € m.	Gross positive mark-to-market of contracts	Potential Future Credit Exposure	Netting benefits	Collateral held	Net credit exposure
Mark-to-Market Method	16,595	16,913	(17,080)	3,541	52,822
Interest rate contracts	9,583	4,302	(8,856)	415	5,029
Currency contracts	1,784	3,917	(2,110)	726	3,592
Equity contracts	2,502	5,184	(4,413)	731	3,274
Commodity contracts	1,048	1,585	(321)	1,091	2,313
Credit derivatives	1,677	1,924	(1,381)	578	2,220
Securities financing transactions	N/M	N/M	N/M	N/M	36,394
Internal Model Method	N/M	N/M	N/M	N/M	113,901
Total	16,595	16,913	(17,080)	3,541	166,723

N/M – Not meaningful

	Dec 31, 2015				
in € m.	Gross positive mark-to-market of contracts	Potential Future Credit Exposure	Netting benefits	Collateral held	Net credit exposure
Mark-to-Market Method	21,786	15,246	(17,478)	2,748	46,521
Interest rate contracts	13,489	2,839	(12,205)	229	4,122
Currency contracts	1,740	1,933	(1,777)	361	1,896
Equity contracts	3,778	6,616	(1,553)	533	8,841
Commodity contracts	1,387	1,605	(867)	902	2,125
Credit derivatives	1,391	2,253	(1,075)	723	2,569
Securities financing transactions	N/M	N/M	N/M	N/M	26,966
Internal Model Method	N/M	N/M	N/M	N/M	108,646
Total	21,786	15,246	(17,478)	2,748	155,166

N/M – Not meaningful

The overall increase predominantly reflects a change within securities financing transactions as a result of a different application of netting for a specific portfolio. Market movements resulted in an increase in interest rate and currency contracts and a decrease in equity contracts.

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 “used for own credit portfolio” and the part held in the regulatory trading book, referred to as “acting as intermediary”.

Nominal volumes of credit derivative exposure

in € m.	Dec 31, 2016				Total ¹
	Used for own credit portfolio		Acting as intermediary		
	Protection bought	Protection sold	Protection bought	Protection sold	
Credit default swaps – single name	11,391	524	326,748	317,440	656,103
Credit default swaps – multi name	0	0	454,456	442,431	896,887
Total return swaps	0	465	4,205	2,586	7,257
Total notional amount of credit derivatives	11,391	989	785,409	762,458	1,560,247

¹ Includes credit default swaps on indices and nth-to-default credit default swaps.

in € m.	Dec 31, 2015				Total ¹
	Used for own credit portfolio		Acting as intermediary		
	Protection bought	Protection sold	Protection bought	Protection sold	
Credit default swaps – single name	3,574	387	383,293	365,940	753,194
Credit default swaps – multi name	0	0	324,648	311,626	636,273
Total return swaps	0	45	5,132	3,819	8,996
Total notional amount of credit derivatives	3,574	432	713,073	681,385	1,398,463

¹ Includes credit default swaps on indices and nth-to-default credit default swaps.

The notional value of credit derivatives qualifying as hedges for regulatory purposes in the regulatory banking book amounts to € 13.4 billion per December 2016 (€ 21.3 billion per December 2015).

The overall increase in nominal volumes reflects the extended market activities of our business as well as market conditions. This is accompanied by an ongoing change in our business strategy where we reduce our volumes in single name products and shift this on an increasing level into the multi name business.

The increase in the protection bought positions for our own credit portfolio reflects increased protection activities which is also eligible for regulatory purposes.

Economic capital usage for credit risk

Economic Capital Usage for Credit Risk per Business Area

in € m.	Dec 31, 2016	Dec 31, 2015	2016 increase (decrease) from 2015	
			in € m.	in %
Global Markets	4,984	4,838	146	3
Corporate & Investment Banking	3,202	3,899	(697)	(18)
Private, Wealth and Commercial Clients	1,726	1,678	48	3
Deutsche Asset Management	62	90	(27)	(31)
Postbank	2,582	2,601	(19)	(1)
Non-Core Operations Unit	108	537	(429)	(80)
Consolidation & Adjustments and Other	442	42	399	939
Total	13,105	13,685	(579)	(4)

The economic capital usage for credit risk decreased to € 13.1 billion as of December 31, 2016, € 579 million or 4 % lower compared to year-end 2015. The economic capital usage for credit risk decreased mainly due to lower exposure.

Securitization Details

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 MRSA are included in this chapter, while details of the trading book securitization positions covered under the Comprehensive Risk Measure (“CRM”) are described in chapter “Trading Market Risk”.

Outstanding Exposures Securitized

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 €59.3 billion total outstanding securitized exposure reported as of December 31, 2016 in the table below as originator, the amount retained was €43.9 billion reflecting an increase in both outstanding securitized as well as retained exposures which for December 31, 2015 were €55.3 billion and €40.1 billion respectively.

For sponsor relationships, the total outstanding exposure securitized reported in the table below represents the principal notional amount of outstanding exposures of the entities issuing the securities and other receivables. As of December 31, 2016, our retained or re-purchased exposure of the €9.0 billion total outstanding exposure securitized shown in the sponsor columns including multi-seller transactions was €910 million. The remaining exposure is held by third parties. As of December 31, 2015, our total outstanding exposure securitized resulting from sponsoring activities amounted to €7.1 billion. This included exposure from multi-seller transactions in the amount of €4.3 billion.

Outstanding Exposures Securitized by Exposure Type (Overall Pool Size) within the Banking Book

in € m.	Dec 31, 2016				Dec 31, 2015			
	Originator		Sponsor ¹		Originator		Sponsor ¹	
	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic
Residential mortgages	4,940	0	680	0	8,157	0	670	69
Commercial mortgages	6,930	0	6,816	0	7,848	0	4,408	0
Credit card receivables	0	0	0	0	0	0	0	0
Leasing	123	0	349	0	93	0	0	0
Loans to corporates or SMEs (treated as corporates) ²	40	47,280	1,118	0	70	39,156	1,922	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	0	0	0	0	0	0	0
Total outstanding exposures securitized⁴	12,032	47,280	8,963	0	16,167	39,156	7,000	69

¹ As of December 31, 2016 included under sponsor is the amount €6.8 billion of multi-seller related securitized exposures, of which we have originated €3.5 billion, and therefore have also included this amount under originator. For December 31, 2015 the amounts were €4.3 billion and €2.6 billion respectively.

² SMEs are small- or medium-sized entities.

³ For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table “Banking Book Securitization Positions Retained or Purchased by Risk Weight Band”.

The table below provides the total outstanding exposure securitized in relation to securitization positions held in our regulatory trading book separately for originator and sponsor activities and further broken down into traditional and synthetic transactions. Short synthetic single tranche CDOs have been reflected as originator positions for which the synthetic pool size was determined as the maximum pool size of the position-sets referencing a given synthetic pool. 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. In accordance with the general plan to wind down the NCOU by year end 2016 the outstanding exposures securitized from synthetic securitizations decreased by €85.8 billion.

Outstanding Exposures Securitized by Exposure Type (Overall Pool Size) within the Trading Book

in € m.	Dec 31, 2016				Dec 31, 2015			
	Originator		Sponsor ¹		Originator		Sponsor ¹	
	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic	Traditional	Synthetic
Residential mortgages	1,478	0	6,124	0	6,743	0	7,671	0
Commercial mortgages	48,942	0	62,414	0	41,217	6,645	46,288	0
Credit card receivables	0	0	0	0	0	0	0	0
Leasing	0	0	0	0	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ²	56	7,231	0	0	58	86,411	0	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	838	0	0	0	3,653	0	2,003	0
Total outstanding exposures securitized³	51,313	7,231	68,538	0	51,671	93,056	55,962	0

¹ As of December 31, 2016 included under sponsor is the amount €62.4 billion of multi-seller related securitized exposures, of which we have originated €26.5 billion, and therefore have also included this amount under originator. For December 31, 2015 the amounts were €49.3 billion and €20.7 billion respectively.

² SMEs are small- or medium-sized entities.

³ For a regulatory assessment of our exposure to market risk in relation to securitization activity in the trading book see table "Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to the MRSA". Additionally the table includes securitized exposure as originator amounting to €7.6 billion and as sponsor amounting to €7.0 billion already reflected in table "Outstanding Exposures Securitized by Exposure Type (Overall Pool Size) within the Banking Book".

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 2016 and 2015 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, 2016	2016	Dec 31, 2015	2015
	Impaired/ past due ¹	Losses	Impaired/ past due ¹	Losses
Residential mortgages	1,085	3	1,437	3
Commercial mortgages	5	10	0	0
Credit card receivables	0	0	0	0
Leasing	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ²	46	0	32	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
Total impaired and past due exposures securitized and losses recognized³	1,136	13	1,469	3

¹ Includes the impaired and past due exposures in relation to the overall pool of multi-seller securitizations which could reflect more than our own originated portion.

² SMEs are small- or medium-sized entities.

³ For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table "Banking Book Securitization Positions Retained or Purchased by Risk Weight Band".

The total impaired or past due exposure securitized decreased by €333 million in 2016. The reduction was mainly attributed to the exposure types "Residential mortgages". Losses recorded by us in 2016 increased to €13 million compared to €3 million in 2015.

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, 2016		Dec 31, 2015	
	Banking Book	Trading Book	Banking Book	Trading Book
Residential mortgages	0	0	0	0
Commercial mortgages	76	1,273	0	2,236
Credit card receivables	0	0	0	0
Leasing	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ¹	0	0	0	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	2,500	0	0
Outstanding exposures awaiting securitization	76	3,773	0	2,236

¹ SMEs are small- or medium-sized entities.

As of December 31, 2016 we held commercial mortgages in the amount of €1.3 billion and derivative exposures amounting to €2.5 billion in the trading book with the intention to securitize them.

Securitization Positions Retained or Purchased

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 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	thereof $\geq 1,250\%$ risk weighted	Capital requirements	On-balance securitization positions	Off-balance, derivative and SFT securitization positions	Regulatory exposure value	thereof $\geq 1,250\%$ risk weighted	Capital requirements
Residential mortgages	5,812	631	6,443	104	184	1,552	209	1,761	194	72
Commercial mortgages	1,190	725	1,915	60	98	975	1,676	2,650	46	75
Credit card receivables	175	662	838	0	18	51	44	95	0	1
Leasing	3,994	692	4,687	7	54	21	0	21	0	1
Loans to corporates or SMEs (treated as corporates) ¹	49,733	1,922	51,655	10	587	1,135	206	1,342	231	95
Consumer loans	7,610	1,114	8,724	0	134	484	0	484	1	14
Trade receivables	0	0	0	0	0	7	0	7	0	0
Covered bonds	0	0	0	0	0	13	0	13	0	0
Other liabilities	0	0	0	0	0	0	0	0	0	0
Other assets	2,140	234	2,374	10	35	190	11	201	20	15
Total securitization positions retained or purchased²	70,655	5,981	76,636	192	1,110	4,428	2,146	6,574	491	272

¹ SMEs are small- or medium-sized entities.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activities see table "Banking Book Securitization Positions Retained or Purchased by Risk Weight Band" and for our exposure to market risk in relation to securitization activities see table "Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to MRSA".

in €m.	Banking Book					Trading Book				
	On-balance securitization positions	Off-balance, derivative and SFT securitization positions	Regulatory exposure value	thereof 1,250 % risk weighted	Capital requirements	On-balance securitization positions	Off-balance, derivative and SFT securitization positions	Regulatory exposure value	thereof 1,250 % risk weighted	Capital requirements
Residential mortgages	6,481	1,011	7,492	199	335	2,125	252	2,378	355	230
Commercial mortgages	1,882	597	2,479	91	123	1,484	3,767	5,251	194	234
Credit card receivables	184	0	184	0	3	22	33	55	0	0
Leasing	5,156	492	5,648	1	89	58	0	58	0	3
Loans to corporates or SMEs (treated as corporates) ¹	45,218	1,825	47,043	27	498	1,683	13,857	15,540	2,064	163
Consumer loans	9,376	1,098	10,474	0	151	480	7	488	3	12
Trade receivables	0	92	92	0	1	17	0	17	0	1
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	2,296	49	2,345	71	55	897	350	1,248	223	162
Total securitization positions retained or purchased²	70,592	5,163	75,755	390	1,254	6,767	18,267	25,034	2,838	805

¹ SMEs are small- or medium-sized entities.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activities see table "Banking Book Securitization Positions Retained or Purchased by Risk Weight Band" and for our exposure to market risk in relation to securitization activities see table "Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to MRSA".

Total retained or purchased securitization positions in the banking book increased by €881 million throughout the year 2016. The increase is driven by our originator activities related to the exposure type "Loans to corporates or SMEs". This effect was to a large extent offset by the decrease within the exposure types "Consumer loans" and "Leasing" due to the de-risking activities in our NCOU.

Within the trading book, the securitization exposure decreased by €18.5 billion or 74 % mainly for the exposure type "Loans to corporates or SMEs" predominantly due to matured or wound down synthetic single tranche CDOs. Due to the overall exposure decrease and our active de-risking strategy the capital requirement declined by €533 million in 2016.

Securitization Positions Retained or Purchased by Region (Exposure Amount)

in €m.	Dec 31, 2016		Dec 31, 2015	
	Banking Book	Trading Book	Banking Book	Trading Book
Europe	25,492	1,438	25,120	7,136
Americas	45,241	3,827	45,100	16,007
Asia/Pacific	5,756	701	5,462	1,310
Other	147	608	72	581
Total securitization positions retained or purchased¹	76,636	6,574	75,755	25,034

¹ For a regulatory assessment of our exposure to credit risk in relation to securitization activities see table "Banking Book Securitization Positions Retained or Purchased by Risk Weight Band" and for our exposure to market risk in relation to securitization activities see table "Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to MRSA".

The amounts shown in the table above are based on the country of domicile of the obligors of the exposures securitized. The exposure increase in the banking book for the regions “Americas”, “Europe” and “Asia/Pacific” are a result of our originator activities. The exposure reduction in the trading book within the regions “Europe” and “Americas” is driven by the aforementioned regulatory exposure decline of synthetic single tranche CDOs.

Types of Special Purposes Entities used by Deutsche Bank as Sponsor of Securitizations

In 2015 we ceased to act as a sponsor of asset backed commercial paper (“ABCP”) programs which we did not revive in 2016.

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.

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 (77 %) of our €1.2 billion sponsor positions consists of senior securitization facilities backed by corporate loans.

Our division Deutsche Asset Management (“Deutsche AM”) provides asset management services to undertakings for collective investments, including mutual funds and alternative investment funds, and private individuals offering access to traditional and alternative investments across all major asset classes, including securitization positions. Less than 3 % of those positions consisted of tranches in securitization transactions where Deutsche Bank acts as originator or sponsor.

Banking Book Securitization Exposure

Banking Book Securitization Positions Retained or Purchased by Risk Weight Band

in € m.	Dec 31, 2016			Dec 31, 2015		
	Exposure amount	Capital requirements IRBA ¹	Capital requirements standardized approach	Exposure amount	Capital requirements IRBA ¹	Capital requirements standardized approach
≤ 10 %	68,693	631	0	65,061	343	0
> 10 ≤ 20 %	3,069	24	12	4,322	34	17
> 20 ≤ 50 %	1,807	28	25	2,714	176	30
> 50 ≤ 100 %	2,184	46	77	2,645	108	58
> 100 ≤ 350 %	496	15	1	295	46	1
> 350 ≤ 650 %	126	52	0	159	51	0
> 650 < 1,250 %	68	54	0	170	128	0
≥ 1,250 % ≤ 1,325 %	192	141	4	390	250	13
Total securitization positions retained or purchased	76,636	991	119	75,755	1,136	118

¹ After considering value adjustments according to Article 266 (1,2) CRR. Including capital requirements for maturity mismatch of synthetic securitizations by risk weight band defined as notional weighted average risk weight of the underlying pool.

Although the overall banking book exposure increased by 1.2 % to €76.6 billion, the capital requirements decreased by 11.5 % to €1.1 billion. This is due to the fact that the major exposure increase (€3.6 billion), driven by the new originator activities was subject to the ≤ 10 % risk weight bucket. This effect was partially offset by de-risking activities within our NCOU resulting in €102 million and €198 million exposure reductions subject to the > 650 < 1,250 % and the ≥ 1,250 ≤ 1,325 % buckets respectively.

The largest portion (91.3 %) of IRBA eligible banking book securitization exposures are treated according to the Supervisory Formula Approach ("SFA"). For the remaining IRBA eligible banking book exposures (8.7 %) we use the Ratings Based Approach ("RBA").

Banking Book Securitization Positions Retained or Purchased by Risk Weight Bands subject to the IRBA-Rating Based Approach (RBA)

in € m.	Dec 31, 2016				Dec 31, 2015			
	Exposure amount		Capital requirements, IRBA-RBA ¹		Exposure amount		Capital requirements, IRBA-RBA ¹	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation ²	Re- Securitization
≤ 10 %	2,299	0	14	0	3,625	0	23	0
> 10 ≤ 20 %	1,873	0	19	0	2,203	0	22	0
> 20 ≤ 50 %	634	46	12	1	812	698	142	22
> 50 ≤ 100 %	961	0	44	0	1,445	18	90	1
> 100 ≤ 350 %	454	7	12	1	170	33	28	3
> 350 ≤ 650 %	6	0	2	0	16	10	6	3
> 650 < 1,250 %	7	0	4	0	69	17	38	9
≥ 1,250 % ≤ 1,325 %	180	6	132	6	302	18	192	18
Total securitization positions retained or purchased	6,414	59	239	9	8,642	794	541	56

¹ After considering value adjustments according to Article 266 (1,2) CRR.

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

Exposures subject to the securitization IRBA-RBA decreased by €2.2 billion mainly driven by a decline of book values. Our re-securitization exposure reduced by €735 million, predominantly due to the sale of a significant transaction which accounted to 39 % of the total re-securitization portfolio.

Banking Book Securitization Positions Retained or Purchased by Risk Weight Band subject to the IRBA-Supervisory Formula Approach (SFA)

in € m.	Dec 31, 2016				Dec 31, 2015			
	Exposure amount		Capital requirements, IRBA-SFA ¹		Exposure amount		Capital requirements, IRBA-SFA ¹	
	Securiti- zation	Re- Securitization	Securiti- zation ²	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	66,394	0	617	0	61,435	0	320	0
> 10 ≤ 20 %	415	0	5	0	1,006	55	11	1
> 20 ≤ 50 %	509	0	15	0	464	0	11	0
> 50 ≤ 100 %	47	0	2	0	299	0	17	0
> 100 ≤ 350 %	26	0	3	0	83	0	15	0
> 350 ≤ 650 %	120	0	49	0	133	0	43	0
> 650 < 1,250 %	61	0	50	0	84	0	81	0
1,250 %	2	0	2	0	37	0	40	0
Total securitization positions retained or purchased	67,575	0	743	0	63,541	55	538	1

¹ After considering value adjustments according to Article 266 (1,2) CRR.

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

Banking Book exposure subject to the IRBA-Supervisory Formula Approach overall increased to €67.6 billion in 2016, mainly driven by new originator activities.

The Credit Risk Standardized Approach ("CRSA") is used for securitization positions where the underlying portfolio predominantly consists of credit risk exposures, which would qualify for application of the CRSA if these exposures would be directly held by us.

Banking Book Securitization Positions Retained or Purchased by Risk Weight Band subject to the Credit Risk Standardized Approach (CRSA)

in € m.	Dec 31, 2016				Dec 31, 2015			
	Exposure amount		Capital requirements, SA		Exposure amount		Capital requirements, SA	
	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization	Securiti- zation	Re- Securitization
≤ 10 %	0	0	0	0	0	0	0	0
> 10 ≤ 20 %	781	0	12	0	1,058	0	17	0
> 20 ≤ 50 %	619	0	25	0	740	0	30	0
> 50 ≤ 100 %	1,176	0	77	0	882	0	58	0
> 100 ≤ 350 %	9	0	1	0	9	0	1	0
> 350 ≤ 650 %	0	0	0	0	0	0	0	0
> 650 < 1,250 %	0	0	0	0	0	0	0	0
1,250 %	4	0	4	0	34	0	13	0
Total securitization positions retained or purchased	2,588	0	119	0	2,724	0	118	0

Exposure subject to CRSA decreased by € 135 million, mainly driven by de-risking activities in our NCOU.

Trading Book Securitization Exposure

For trading book securitization positions not covered under the Comprehensive Risk Measure (“CRM”), 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 “Regulatory Securitization Framework” as well as in section “Trading Market Risk”.

Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to the Market Risk Standardized Approach (MRSA)

in € m.	Dec 31, 2016				Dec 31, 2015			
	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 %	618	0	3	0	11,746	0	18	0
> 10 ≤ 20 %	3,977	0	40	0	6,009	0	69	0
> 20 ≤ 50 %	651	155	20	5	799	179	24	5
> 50 ≤ 100 %	480	31	33	2	1,166	122	74	8
> 100 ≤ 350 %	45	26	7	5	686	62	25	9
> 350 ≤ 650 %	92	6	23	3	1,054	13	35	4
> 650 < 1,250 %	0	0	0	0	360	0	5	0
1,250 %	461	31	111	20	2,656	182	348	182
Total securitization positions retained or purchased	6,325	249	238	34	24,476	558	595	209

On a year to year comparison the capital requirement of trading book securitization positions decreased mainly in the risk weight bucket 1,250 % due to the reduced NCOU portfolio. Positions contributing to the exposure amount but subject to an own funds requirements cap according to Article 335 CRR are present in all risk weight buckets.

Re-securitization Positions

Trading book re-securitization exposure is reduced by 30 % as a result of hedging being recognized according to Articles 327-332 CRR. The decrease both in the banking book and trading book re-securitization is mainly driven by de-risking activities in our NCOU.

Re-Securitization Positions Retained or Purchased (Exposure Amount)

in € m.	Dec 31, 2016				Dec 31, 2015			
	Banking Book		Trading Book		Banking Book		Trading Book	
	Before hedging/insurances	After hedging/insurances						
Re-Securitization Positions	59	59	356	249	849	849	1,255	558

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.

Securitization Activities

The 2016 year-end amounts in the tables below show a decrease of our securitization activity in the banking book compared with 2015. This reduced activity predominately concerned the exposure type "Loans to corporates or SMEs" dominated by the synthetic transactions executed by the Credit Portfolio Strategies Group ("CPSG"). Securitization activities in the trading book rose slightly by 4 % to € 10.3 billion driven by a stronger demand for US CMBS.

Securitization Activity – Total Outstanding Exposures Securitized (i.e., the underlying pools) by Exposure Type within the Banking Book

in € m.	Dec 31, 2016		Originator 2016	Sponsor Dec 31, 2016	
	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	Traditional	Synthetic
Residential mortgages	0	0	0	0	0
Commercial mortgages	0	0	0	0	0
Credit card receivables	0	0	0	0	0
Leasing	88	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ¹	0	7,610	0	95	0
Consumer loans	0	0	0	0	0
Trade receivables	0	0	0	0	0
Covered Bonds	0	0	0	0	0
Other liabilities	0	0	0	0	0
Other assets	0	0	0	0	0
Total Outstanding Exposures Securitized²	88	7,610	0	95	0

¹ SMEs are small- or medium-sized entities.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table "Banking Book Securitization Positions Retained or Purchased by Risk Weight Band".

in € m.	Dec 31, 2015		Originator 2015	Sponsor Dec 31, 2015	
	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	Traditional	Synthetic
Residential mortgages	0	0	0	0	0
Commercial mortgages	488	0	7	0	0
Credit card receivables	0	0	0	0	0
Leasing	0	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ¹	0	14,640	0	772	0
Consumer loans	0	0	0	0	0
Trade receivables	0	0	0	0	0
Covered Bonds	0	0	0	0	0
Other liabilities	0	0	0	0	0
Other assets	0	0	0	0	0
Total Outstanding Exposures Securitized²	488	14,640	7	772	0

¹ SMEs are small- or medium-sized entities.

² For a regulatory assessment of our exposure to credit risk in relation to securitization activity in the banking book see table "Banking Book Securitization Positions Retained or Purchased by Risk Weight Band".

The lower exposure originated via synthetic securitizations in 2016 compared to 2015 in the banking book is mainly driven by decreased market activity within "Loans to corporate and SMEs" securitizations resulting from a general market deterioration in this segment.

Securitization Activity – Total Outstanding Exposures Securitized by Exposure Type within the Trading Book

	Originator			Sponsor ¹	
	Dec 31, 2016		2016	Dec 31, 2016	
in € m.	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	Traditional	Synthetic
Residential mortgages	0	0	0	811	0
Commercial mortgages	10,272	0	98	15,286	0
Credit card receivables	0	0	0	0	0
Leasing	0	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ²	0	0	0	0	0
Consumer loans	0	0	0	0	0
Trade receivables	0	0	0	0	0
Covered Bonds	0	0	0	0	0
Other liabilities	0	0	0	0	0
Other assets	0	0	0	0	0
Total Outstanding Exposures Securitized³	10,272	0	98	16,097	0

¹ Included under sponsor is the amount € 15.3 billion exposures securitized, of which we originated € 7.5 billion, also included under originator.

² SMEs are small- or medium-sized entities.

³ For a regulatory assessment of our exposure to market risk in relation to securitization activity in the trading book see table "Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to the MRSA".

	Originator			Sponsor ¹	
	Dec 31, 2015		2015	Dec 31, 2015	
in € m.	Traditional	Synthetic	Realized gains (losses) from sales/ liquidations	Traditional	Synthetic
Residential mortgages	0	0	0	1,572	0
Commercial mortgages	8,287	0	73	15,106	0
Credit card receivables	0	0	0	0	0
Leasing	0	0	0	0	0
Loans to corporates or SMEs (treated as corporates) ²	0	0	0	0	0
Consumer loans	0	0	0	0	0
Trade receivables	0	0	0	0	0
Covered Bonds	0	0	0	0	0
Other liabilities	0	0	0	0	0
Other assets	1,631	0	0	0	0
Total Outstanding Exposures Securitized³	9,918	0	73	16,678	0

¹ Included under sponsor is the amount € 15.1 billion exposures securitized, of which we originated € 6.3 billion, also included under originator.

² SMEs are small- or medium-sized entities.

³ For a regulatory assessment of our exposure to market risk in relation to securitization activity in the trading book see table "Trading Book Securitization Positions Retained or Purchased by Risk Weight Band subject to the MRSA".

Market Risk Exposure

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 centre 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 Financial Report Note 14 “Financial Instruments carried at Fair Value”.

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 central function in Finance described above.

Balance Sheet and Trading Book Assets and Liabilities

The tables below present trading or banking book splits for assets and liabilities of our balance sheet from a regulatory point of view.

Regulatory Trading Book Assets and Liabilities as part of the Balance Sheet

in € m.	Dec 31, 2016			Dec 31, 2015		
	Balance Sheet	Trading Book	Banking Book ¹	Balance Sheet	Trading Book	Banking Book ¹
Assets						
Cash and central bank balances	181,364	948	180,416	96,940	2,177	94,763
Interbank balances (w/o central banks)	11,606	1,511	10,095	12,842	2,575	10,267
Central banks funds sold and securities purchased under resale agreements ²	16,287	819	15,468	22,456	3,588	18,868
Securities borrowed	20,081	19,580	501	33,557	33,250	307
Financial assets at fair value through profit or loss						
Trading Assets ³	743,781	696,238	47,543	820,883	770,642	50,240
Positive market values from derivative financial instruments	171,044	149,566	21,478	196,035	177,417	18,618
Financial assets designated at fair value through profit or loss	485,150	482,375	2,775	515,594	512,344	3,251
Financial assets available for sale	87,587	64,297	23,289	109,253	80,882	28,371
Equity method investments	56,228	26	56,202	73,583	47	73,536
Loans	1,027	3	1,024	1,013	0	1,013
Securities held to maturity	408,909	12,969	395,940	427,749	13,555	414,194
Property and equipment	3,206	0	3,206	0	0	0
Goodwill and other intangible assets	2,804	0	2,804	2,846	0	2,846
Other assets ⁴	8,982	0	8,982	10,078	0	10,078
Assets for current tax	126,045	57,597	68,448	118,137	45,156	72,981
Deferred tax assets	1,559	0	1,559	1,285	0	1,285
Deferred tax assets	8,666	0	8,666	7,762	0	7,762
Total Assets	1,590,546	789,691	800,855	1,629,130	870,990	758,140

¹ Includes exposure in relation to non regulatory consolidated entities.

² Includes as of December 31, 2016 and as of December 31, 2015 only securities purchased under resale agreements.

³ The regulatory banking book primarily includes debt securities as part of our liquidity portfolio as well as traded loans which do not fulfill the criteria for being allocated to the regulatory trading book.

⁴ Regulatory trading book positions mainly include brokerage receivables and derivatives qualifying for hedge accounting.

in € m.	Dec 31, 2016			Dec 31, 2015		
	Balance Sheet	Trading Book	Banking Book	Balance Sheet	Trading Book	Banking Book
Financial liabilities at fair value through profit or loss						
Trading liabilities	581,971	572,705	9,265	599,754	592,020	7,733
Negative market values from derivative financial instruments	57,029	54,137	2,891	52,304	51,614	690
Financial liabilities designated at fair value through profit or loss	463,858	462,207	1,651	494,076	491,574	2,502
Investment contract liabilities	60,492	55,769	4,723	44,852	40,310	4,541
Remaining Liabilities	592	592	0	8,522	8,522	0
Remaining Liabilities	943,756	127,216	816,540	961,752	199,085	762,667
Total Liabilities	1,525,727	699,921	825,805	1,561,506	791,105	770,400

The vast majority of our trading book assets on our balance sheet are financial assets at fair value through profit or loss. The total decrease in balance sheet assets of €38.6 billion compared to year-end 2015 was mainly driven by an decrease in financial assets at fair value through profit or loss and Loans, partially offset by an increase in cash and central bank balances.

Within liabilities the vast majority of our trading book is comprised of financial liabilities at fair value through profit or loss. The total decrease in balance sheet liabilities of €35.8 billion compared to year-end 2015 was mainly driven by an decrease in negative market values from derivative financial instruments, partially offset by an increase in financial liabilities designated at fair value through profit or loss.

Market Risk internal models approach (IMA)

Market Risk under the internal models approach (IMA)

in € m.	Dec 31, 2016	
	RWA	Capital Re-quiremen
1 VaR (higher of values a and b)	5,957	477
(a) Previous day's VaR (Article 365(1) (VaRt-1))		127
(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)		477
2 SVaR (higher of values a and b)	14,271	1,142
(a) Latest SVaR (Article 365(2) (sVaRt-1))		273
(b) Average of the SVaR (Article 365(2) during the preceding sixty business days (sVaRavg) x multiplication factor (ms) (Article 366)		1,142
3 Incremental risk charge -IRC (higher of values a and b)	8,662	693
(a) Most recent IRC value (incremental default and migration risks in accordance with Articles 370 and 371 of the CRR)		576
(b) Average of the IRC number over the preceding 12 weeks		693
4 Comprehensive Risk Measure – CRM (higher of values a, b and c)	273	22
(a) Most recent risk number for the correlation trading portfolio (Article 377 of the CRR)		18
(b) Average of the risk number for the correlation trading portfolio over the preceding 12-weeks		22
(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)		7
5 Total	29,163	2,333

Value-at-Risk Results

Value-at-Risk Metrics of Trading Units of Deutsche Bank Group (excluding Postbank)

The tables and graph below present the value-at-risk metrics calculated with a 99 % confidence level and a one-day holding period for our trading units. They exclude contributions from Postbank trading book which are calculated on a stand-alone basis.

Value-at-Risk of our Trading Units by Risk Type

in € m.	Total		Diversification effect		Interest rate risk		Credit spread risk		Equity price risk		Foreign exchange risk ¹		Commodity price risk	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Average	32.0	43.3	(35.0)	(40.9)	19.7	20.3	26.6	30.9	9.3	16.6	10.7	15.0	0.7	1.3
Maximum	59.4	65.6	(57.6)	(59.2)	29.5	30.2	32.5	40.3	52.4	28.3	16.7	25.0	3.3	4.0
Minimum	20.4	28.7	(25.6)	(31.0)	14.8	16.2	22.3	24.0	4.4	9.2	3.6	6.0	0.2	0.5
Period-end	30.1	33.3	(36.9)	(38.8)	19.9	18.3	24.3	26.2	10.0	11.7	12.6	15.1	0.2	0.9

¹ Includes value-at-risk from gold and other precious metal positions.

The average value-at-risk over 2016 was €32.0 million, which is a decrease of €11.2 million compared with the full year 2015. The reduction in the average was driven by decreases across the credit spread, foreign exchange and equity asset classes as a result of a decrease in directional exposure on average compared to the full year 2015. The spike in value-at-risk in December 2016 was driven by activity on the trading books for a short period of time during the facilitation of client transactions.

Regulatory Trading Market Risk Measures (excluding Postbank)

The table below presents the stressed value-at-risk metrics calculated with a 99 % confidence level and a one-day holding period for our trading units. It excludes contributions from Postbank's trading book which are calculated on a stand-alone basis

Average, Maximum and Minimum Stressed Value-at-Risk by Risk Type

in € m.	Total		Diversification effect		Interest rate risk		Credit spread risk		Equity price risk		Foreign exchange risk ¹		Commodity price risk	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Average	85.2	105.1	(78.2)	(114.5)	51.9	60.7	74.9	106.7	20.6	22.8	14.8	26.7	1.3	2.5
Maximum	143.7	135.7	(150.0)	(186.7)	82.5	84.2	99.3	154.5	144.5	68.7	30.4	59.8	3.9	7.6
Minimum	60.4	82.4	(53.4)	(71.7)	37.4	45.1	59.0	82.6	2.4	0.1	3.4	5.7	0.4	0.7
Period-end	75.8	106.3	(91.3)	(98.0)	51.9	45.5	63.0	90.9	29.6	44.1	22.1	22.6	0.5	1.2

¹ Includes value-at-risk from gold and other precious metal positions.

The average stressed value-at-risk was €85.2 million over 2016, a decrease of €19.9 million compared with the full year 2015. The reduction in the average was driven by decreases coming from across the credit spread, foreign exchange and equity asset classes as a result of a decrease in directional exposure on average compared to the full year 2015. Additionally interest rate stressed value-at-risk has decreased on average over 2016 due to changes in the composition of the portfolio. Similar to value-at-risk there was a spike in December 2016 due to the facilitation of client transactions.

For regulatory reporting purposes, the incremental risk charge for the respective reporting dates represents the higher of the spot value at the reporting dates, and their preceding 12-week average calculation

Average, Maximum and Minimum Incremental Risk Charge of Trading Units (with a 99.9 % confidence level and one-year capital horizon)^{1,2,3}

in € m.	Total		Non-Core Operations Unit		Global Credit Trading		Core Rates		Fixed Income & Currencies APAC		Emerging Markets - Debt		Other	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Average	840.2	975.0	52.0	17.5	393.0	539.3	200.4	106.0	188.6	160.0	116.8	235.0	(110.5)	(82.0)
Maximum	944.4	1,020.8	57.3	85.0	405.8	693.0	229.6	179.0	243.0	351.0	128.0	300.0	(65.6)	(52.0)
Minimum	693.0	843.8	44.5	(4.8)	368.0	435.0	173.7	50.0	119.6	113.0	111.6	144.0	(141.8)	(128.0)
Period-end	693.0	890.0	51.8	(1.0)	368.0	489.0	173.7	86.0	119.6	123.0	121.8	259.0	(141.8)	(65.0)

¹ Amounts show the bands within which the values fluctuated during the 12-weeks preceding December 31, 2016 and December 31, 2015, respectively.

² Business line breakdowns have been updated for 2016 reporting to better reflect the current business structure.

³ All liquidity horizons are set to 12 months.

The incremental risk charge as at the end of 2016 was €693 million a decrease of €197 million (22 %) compared with year end 2015. The 12-week average of the incremental risk charge as at the end of 2016 was €840 million and thus €135 million (14 %) lower compared with the average for the 12-week period ended December 31, 2015. The decreased average incremental risk charge is driven by a decrease in credit exposures in global credit trading when compared to the full year 2015.

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

Average, Maximum and Minimum Comprehensive Risk Measure of Trading Units (with a 99.9 % confidence level and one-year capital horizon)^{1,2,3}

in € m.	2016	2015
Average	31.3	188.4
Maximum	39.8	197.3
Minimum	21.9	180.3
Period-end	17.9	190.2

¹ Regulatory Comprehensive Risk Measure calculated for the 12-week period ending December 31.

² Period end is based on the internal model spot value.

³ All liquidity horizons are set to 12 months.

The comprehensive risk measure as at the end of 2016 was €18 million and decreased by €172 million (91 %) compared with year end 2015. The 12-week average of our comprehensive risk measure as at the end of 2016 was €31 million and thus €157 million (83 %) lower compared with the average for the 12-week period ended December 31, 2015. The reduction was due to continued de-risking on the correlation trading portfolio.

Market Risk Standardized Approach

As of December 31, 2016, the securitization positions, for which the specific interest rate risk is calculated using the market risk standardized approach, generated capital requirements of €278.4 million corresponding to risk weighted-assets of €3.5 billion. As of December 31, 2015 these positions generated capital requirements of €811 million corresponding to risk weighted-assets of €10.1 billion. The reduction is due to continued de-risking of securitization exposures.

For nth-to-default credit default swaps the capital requirement increased to €6.4 million corresponding to risk weighted-assets of €80 million compared with €6 million and €78 million as of December 31, 2015.

Additionally, the capital requirement for investment funds under the market risk standardized approach was €39 million corresponding to risk weighted-assets of €487 million as of December 31, 2016, compared with €70 million and €873 million as of December 31, 2015.

The capital requirement for longevity risk under the market risk standardized approach was €46 million for NCOU and PIRM corresponding to risk weighted-assets of €570 million as of December 31, 2016, compared with €36 million and €451 million as of December 31, 2015.

Own funds requirements under the standardized approach for market risk

in €m.	Dec 31, 2016	
	RWA	Capital Re-quiremen
Outright products	1,119	90
Interest rate risk (general and specific) ¹	570	46
Equity risk (general and specific)	445	36
Foreign exchange risk	104	8
Commodity risk	0	0
Options	3,480	278
Simplified approach	0	0
Delta-plus method	0	0
Scenario approach	0	0
Securitization (specific risk)	3,480	278
Total	4,599	368

¹ Longevity Standardized component included.

Economic Capital Usage for our Trading Market Risk

The economic capital usage for trading market risk decreased to €4.2 billion as of December 31, 2016, compared with €4.6 billion at year-end 2015. The decrease is primarily driven by reductions in exposures in the Non-Core Operations Unit, the sale of Abbey Life and lower levels of inventory in securitization and corporate real estate business areas.

Postbank's contribution to the economic capital usage for our trading market risk was minimal.

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.

At December 31; 2016 the amount of the additional value adjustments was €1.4 billion.

Based on Article 159 CRR the total amount of general and specific credit risk adjustments and additional value adjustments for exposures that are treated under the Internal Ratings Based Approach for credit risk and that are in scope of the expected loss calculation may be subtracted from the total expected loss amount related to these exposures. Any remaining positive difference must be deducted from CET 1 capital pursuant to Article 36 (1) lit. d. CRR.

At December 31, 2016 the reduction of the expected loss from subtracting the additional value adjustments was €0.5 billion, which partly mitigated the negative impact of the additional value adjustments on our CET 1 capital.

Economic Capital Usage for our Nontrading Market Risk Portfolios per Business Area

Economic Capital Usage of Nontrading Portfolios by Business Division

in € m.	Dec 31, 2016	Dec 31, 2015	2016 increase (decrease) from 2015	
			in € m.	in %
Global Markets	802	239	563	N/M
Corporate & Investment Banking	233	218	14	7
Private, Wealth and Commercial Clients	358	2,557	(2,199)	(86)
Deutsche Asset Management	2,005	1,881	124	7
Postbank	1,494	1,815	(321)	(18)
Non-Core Operations Unit	148	416	(268)	(64)
Consolidation & Adjustments and Other	5,324	5,752	(428)	(7)
Total	10,364	12,878	(2,515)	(20)

Nontrading market risk economic capital usage totaled €10.4 billion as of December 31, 2016, which is €2.5 billion, or 20 %, below our economic capital usage at year-end 2015.

The increase in economic capital usage for nontrading market risk portfolios in Global Markets was mainly driven by capturing of additional credit spread risk. The decrease of economic capital usage for PW&CC was predominately driven by the sale of Hua Xia Bank Company Limited as well as by methodology enhancements with regard to modeling of non-maturity deposits. The economic capital usage decrease in Postbank was caused by a reduced exposure in the entity's investment bond portfolio and by methodology changes with regard to modeling of non-maturity deposits. The decrease of NCOU was driven by the sale of Maher Terminals USA and further de-risking initiatives within the portfolio. The decrease in economic capital usage in Consolidation & Adjustments was mainly driven by a reduced structural FX risk exposure.

Equity Investments

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 financial assets Available for Sale (AFS), Equity method investments or financial assets designated at fair value through profit or loss.

For details on our accounting and valuation policies related to AFS equity instruments and investments in associates and joint ventures please refer to Notes 1 "Significant Accounting Policies and Critical Accounting Estimates", 14 "Financial Instruments carried at Fair Value" and 18 "Equity Method Investments" of our Annual Report 2016.

Equity Investments Held

The tables 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:

- Equity investments held by entities, which are consolidated for IFRS purposes but not consolidated for regulatory purposes, are included in the tables.
- Collective investment undertakings, which are shown as IFRS, are treated differently for regulatory purposes and are not included in the tables.
- 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 accounted as nil for December 31, 2016, and €14 million as of December 31, 2015.
- Other positions like equity underlings' 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 €314 million as of December 31, 2016, and €233 million as of December 31, 2015.
- The regulatory equity position includes €530 million EAD as of December 31, 2016, and €1.9 billion EAD as of December 31, 2015, 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.

Equity Investments According to IFRS Classification

in € m.	Carrying value	
	Dec 31, 2016	Dec 31, 2015
Financial assets available for sale – equity instruments	1,405	1,689
Exchange-traded positions	405	293
Non-exchange-traded positions	1,000	1,396
Equity method investments	1,026	1,010
Exchange-traded positions	12	31
Non-exchange-traded positions	1,014	979
Financial assets designated at fair value through profit or loss – equity instruments	0	1
Exchange-traded positions	0	0
Non-exchange-traded positions	0	1
Total equity investments	2,431	2,700

Type and nature of these equity investments predominantly relate to investments as described in the “Investment Risk” section of the Risk Report in the Annual Report.

A slight difference between the carrying value of the investment positions and their fair value was only observable for the exchange-traded equity method investments, which had a carrying value of € 12 million and a fair value of € 18 million as of December 31, 2016 compared with € 31 million and a fair value of € 49 million as of December 31, 2015.

Realized Gains (Losses) in the Reporting Period and Unrealized Gains (Losses) at Year-end from Equity Investments

in € m.	2016	2015
	Gains and losses on disposal	691
Impairments	(2)	(611)
Pro-rata share of net income (loss)	183	708
Total realized gains (losses) from equity investments	873	268
	Dec 31, 2016	Dec 31, 2015
Unrealized revaluation gains (losses)	647	778
Difference between carrying value and fair value	5	19
Total unrealized gains (losses) from equity investments	652	797

For AFS equity investments, the components considered are realized gains and losses from sales and liquidations as well as unrealized revaluation gains and losses and impairments. 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 amounts and fair values. In this respect, the realized gains (losses) on disposals, the impairments and the pro-rata share of net income (loss) are referring to the reporting period 2016 and 2015 whereas the unrealized revaluation gains (losses) as well as the difference between the carrying values and the fair values for the at equity investments represent the amounts as of December 31, 2016, and December 31, 2015.

Operational Risk Exposure

Operational Risk – Risk Profile

Operational Risk Losses by Event Type (Profit and Loss view)

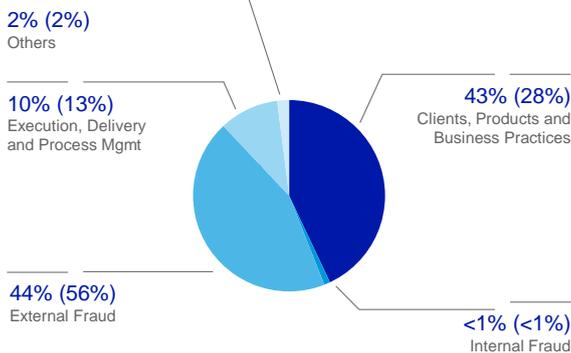
in € m.	2016	2015 ¹
Clients, Products and Business Practices	2,566	3,346
Internal Fraud	396	2,176
External Fraud	18	(197)
Execution, Delivery and Process Management	160	381
Others	23	20
Group	3,163	5,726

¹ Changed 2015 loss figures due to subsequent capture of losses and reclassification.

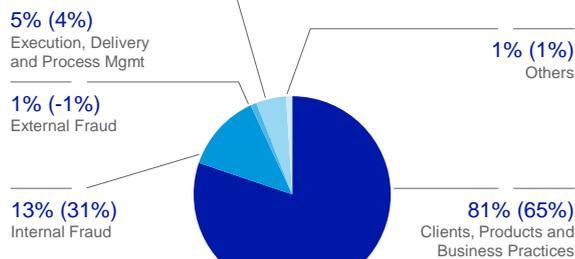
As of December 2016, profit and loss based operational losses decreased by €2.6 billion or 45 % compared to year-end 2015. The decrease was driven by the event types “Clients, Products and Business Practices” and “Internal Fraud”, due to settlements reached and increased litigation reserves for unsettled cases in 2015.

Operational Losses by Event Type occurred in the period 2016 (2010-2015)(1)

Frequency of Operational Losses (first posting date)



Distribution of Operational Losses (posting date)



¹ Percentages in brackets correspond to loss frequency respectively to loss amount for losses occurred in 2010-2015 period. Frequency and amounts can change subsequently.

The above left chart “Frequency of Operational Losses” summarizes operational risk events which occurred in 2016 compared to the five-year period 2011-2015 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 2002 with an additional profit/loss event recognized in 2016, 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 44 % and the event type “Clients, Product and Business Practices” with 43 % of all observed loss events. “Execution, Delivery and Process Management” contributes 10 %. Others are stable at 2 %. The event type “Internal Fraud” has a low frequency, resulting in less than 1 % of the loss events in the period 2016. This is unchanged compared to 2011-2015.

The above right chart “Distribution of Operational Losses” summarizes operational risk loss postings recognized in the profit/loss in 2016 compared to the five-year period 2011-2015. The event type “Clients, Product and Business Practices” dominates the operational loss distribution with a share of 81 % and is determined by outflows related to litigation, investigations and enforcement actions. “Internal Fraud” has the second highest share (13 %) which is related to regulatory events we have experienced in recent years. Finally, the event types “Execution, Delivery and Process Management” (5 %), “Others” (1 %) and “External Fraud” (1 %) can be considered minor, compared to other event types.

Economic Capital usage for Operational Risks

Economic Capital Usage for Operational Risk by Business Division

in € m.	Dec 31, 2016	Dec 31, 2015	2016 increase (decrease) from 2015	
			in € m.	in %
Global Markets	6,567	6,274	293	5
Corporate & Investment Banking	1,763	1,613	150	9
Private, Wealth and Commercial Clients	833	958	(125)	(13)
Deutsche Asset Management	561	282	279	99
Postbank	604	600	4	1
Non-Core Operations Unit	160	452	(292)	(65)
Consolidation & Adjustments and Other	0	64	(64)	(100)
Total economic capital usage for operational risk	10,488	10,243	245	2

The economic capital usage for operational risk as of December 31, 2016 was € 10.5 billion, € 0.2 billion or 2 % higher compared to year-end 2015. The overall increase was mainly driven by large operational risk events which are reflected in our AMA model, in particular through settlements of regulatory matters by financial institutions. The impact of the Bank's settlement with the Department of Justice in the United States to resolve civil claims in connection with the Bank's issuance and underwriting of residential mortgage-backed securities and related securitization activities between 2005 and 2007, which was announced on December 23, 2016, has been analyzed alongside other changes to our operational risk profile in 2016 to confirm the adequacy of our capital requirements.

We have successfully implemented a model change in the first quarter concerning the modeling of the frequency distribution underlying our AMA capital model replacing a previous capital add-on in the fourth quarter. Similarly in the fourth quarter, we have decommissioned an add-on in relation to IT risks after obtaining supervisory approval to use refined scenarios describing potential risks in our IT environment within our model.

Further impacts from the AMA model enhancements on the other operational risk RWA components are expected to materialize alongside the implementation of model changes recently approved by the Joint Supervisory Team.

Role of Corporate Insurance/Deukona

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 €330 million as of December 31, 2016 compared with €290 million as of December 31, 2015. 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.

Business Risk Exposure

Economic capital for business risk captures strategic risk, which also implicitly includes elements of refinancing and reputational risk, and a tax risk component.

Economic Capital Usage for Business Risk by Business Division

in € m.	Dec 31, 2016	Dec 31, 2015	2016 increase (decrease) from 2015	
			in € m.	in %
Global Markets	4,582	5,154	(572)	(11)
Corporate & Investment Banking	171	405	(234)	(58)
Private, Wealth and Commercial Clients	32	1	31	3,973
Deutsche Asset Management	100	0	100	0
Postbank	0	0	0	0
Non-Core Operations Unit	245	261	(16)	(6)
Consolidation & Adjustments and Other	(32)	110	(142)	(129)
Total	5,098	5,931	(832)	(14)

Economic capital usage for business risk as of December 31, 2016 was €5.1 billion, representing a €832 million (14 %) decrease compared to year-end 2015. It principally comprises strategic risk economic capital of €4.85 billion, with tax risk accounting for the remaining €245 million. As of December 31, 2016, strategic risk economic capital of €4.85 billion (excluding tax risk) was almost entirely allocated to Global Markets (€4.58 billion), while the tax risk component was allocated to Non-Core Operations Unit (€245 million). The decrease in 2016 was driven by strategic risk and resulted from a combination of planned restructuring costs and lower earnings expectations for 2016 compared to 2017. In line with earnings growth as per Deutsche Bank's Strategy 2020, future strategic risk economic capital is broadly expected to decrease.

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-months earnings forecasts. Key macro-economic or financial revenue drivers are included to model dependencies between business units.

Liquidity Risk Exposure

Liquidity Requirements under CRR

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 actual and contingent 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. The Liquidity Coverage Ratio is subject to a transitional phase-in period, which rising to 70 % from January 1 2016, 80 % in 2017 and 100 % in 2018.

Our LCR of 128 % as of December 31, 2016 has been calculated in accordance with the Commission Delegated Regulation (EU) 2015/61, (calculated in accordance with the EBA's Implementing Technical Standard on Supervisory Reporting with regard to the LCR).

LCR components

	Dec 31, 2016	Dec 31, 2015
	Liquidity Value (weighted)	Liquidity Value (weighted)
in €bn.		
High quality liquid assets	201	192
Gross inflows	93	111
Gross outflows	250	272
Net outflows	158	161
LCR ratio in %	128 %	119 %

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).

Although the NSFR is scheduled to become a minimum standard internationally, by January 1, 2018, the ratio is subject to national implementation. In the EU, on November 23, 2016, the Commission published a legislative proposal to amend the CRR. The proposal defines, inter alia, a mandatory quantitative NSFR requirement and which would apply two years after the proposal entry into force. The proposal remains subject to change in the EU legislative process. Therefore, for banks domiciled in the EU, the final definition of the ratio and associated implementation timeframe has not yet been confirmed.

Asset Encumbrance

On June 27, 2014 the EBA published guidelines on the disclosure of encumbered and unencumbered assets as mandated by Article 443 CRR. They represent a first step in determining a framework for asset encumbrance and will form the basis of the binding technical standards that the EBA will develop by 2016. We have used these guidelines to complete the following section.

Institutions are instructed to use median values of at least quarterly data on a rolling basis. Therefore we present 2016 and 2015 data based on the median values of the four quarters 2016 and 2015 respectively.

Encumbered assets primarily comprise those on- and off-balance sheet assets that are pledged as collateral against secured funding, collateral swaps, and other collateralized obligations. Additionally, in line with the EBA technical standards on regulatory asset encumbrance reporting, we consider assets placed with settlement systems, including default funds and initial margins as encumbered, as well as other assets pledged which cannot be freely withdrawn such as mandatory minimum reserves at central banks. We also include derivative margin receivable assets as encumbered under these EBA guidelines.

This section refers to asset encumbrance in the group of institutions consolidated for banking regulatory purposes pursuant to the German Banking Act. There under not included are insurance companies or companies outside the finance sector. Assets pledged by our insurance subsidiaries are included in Note 23 "Assets Pledged and Received as Collateral" of the Consolidated Financial Statements, and restricted assets held to satisfy obligations to insurance companies' policy holders are included within Note 40 "Information on Subsidiaries" of the Consolidated Financial Statements.

Encumbered and unencumbered assets

Assets

in € bn. On-balance sheet	Dec 31, 2016			
	Carrying amount of encumbered assets	Fair value of encumbered assets	Unencumbered assets	
			Carrying amount of unencumbered assets	Fair value of unencumbered assets
Debt securities	51.6	51.6	140.3	140.3
Equity instruments	40.5	40.5	29.2	29.2
Other assets:	137.6		1,319.1	
Total	229.6		1,488.6	

in € bn. On-balance sheet	Dec 31, 2015			
	Carrying amount of encumbered assets	Fair value of encumbered assets	Unencumbered assets	
			Carrying amount of unencumbered assets	Fair value of unencumbered assets
Debt securities	65.6	65.6	144.6	144.6
Equity instruments	50.9	50.9	23.2	23.2
Other assets:	113.4		1,302.9	
Total	229.8		1,470.7	

Collateral received

in € bn. Off-balance sheet	Dec 31, 2016	
	Fair value of collateral received	
	Encumbered	Available for encumbrance
Collateral received:	255.5	44.8
Debt securities	176.2	43.7
Equity instruments	79.2	1.1
Other collateral received	0.1	0
Own debt securities issued other than covered bonds and asset backed securities	0	0

in € bn. Off-balance sheet	Dec 31, 2015	
	Fair value of collateral received	
	Encumbered	Available for encumbrance
Collateral received:	245.7	47.5
Debt securities	148.8	45.4
Equity instruments	96.9	1.1
Other collateral received	0	1.0
Own debt securities issued other than covered bonds and asset backed securities	0	0

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 2016, on median basis, €229.6 billion of the Group's on-balance sheet assets were encumbered. These assets primarily related to firm financing of trading inventory and other securities, to funding (i.e., Pfandbriefe and covered bonds) secured against loan collateral and to cash collateral for derivative margin requirements.

For December 2016, on a median basis, the Group had received securities as collateral with a fair value of €300.3 billion, of which €255.5 billion were sold or on pledged. These pledges typically relate to trades to facilitate client activity, including prime brokerage, collateral posted in respect of Exchange Traded Funds and derivative margin requirements.

The above tables of encumbered assets include assets that are not encumbered at an individual entity level, but which may be subject to restrictions in terms of their transferability within the group. Such restrictions may be due to local connected lending requirements or similar regulatory restrictions. In this situation it is not feasible to identify individual balance sheet items that cannot be transferred. '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 AG.

Encumbered assets/collateral received and associated liabilities

	Dec 31, 2016	
in € bn.	Matching liabilities, contingent liabilities, securities lent	Carrying value of encumbered assets, fair value of encumbered collateral received and own debt securities issued
On-balance/off-balance sheet amount of selected financial liabilities and financial assets	461.4	486.6

	Dec 31, 2015	
in € bn.	Matching liabilities, contingent liabilities, securities lent	Carrying value of encumbered assets, fair value of encumbered collateral received and own debt securities issued
On-balance/off-balance sheet amount of selected financial liabilities and financial assets	429.6	472.5

The above table shows the total amount of encumbered on- and off-balance sheet assets against the corresponding liabilities, contingent liabilities or securities lent that have given rise to the encumbrance.

