COMMERZBANK
The bank at your side

Disclosure Report as at 31 December 2018

in accordance with the Capital Requirements Regulation (CRR)

Contents

Due to rounding, numbers and percentages presented throughout this report may not add up precisely to the totals provided.

Introduction

Commerzbank

Commerzbank is one of Germany's leading banks for private and corporate clients and an internationally active commercial bank. Domestically, it has one of the densest branch networks of any private-sector bank in Germany, with approximately 1,000 branches, serving a total of around 18.8 million private and small-business customers and over 70,000 corporate clients including multinational groups, financial service providers and institutional clients worldwide.

As part of its strategy, Commerzbank is focusing its business activities on the two core segments "Private and Small-Business Customers" and "Corporate Clients", offering a comprehensive portfolio of banking and capital market services. The run-off segment "Asset & Capital Recovery (ACR)" comprises – besides the Public Finance business – all non-strategic activities of commercial real estate and ship finance. Each segment is managed by a member of the Board of Managing Directors.

All staff and management functions are contained in Group Management: Group Audit, Group Communications, Group Compliance, Group Finance, Group Human Resources, Group Investor Relations, Group Legal, Group Tax, Group Treasury, Big Data & Advanced Analytics and the central risk functions. The support functions are provided by Group Services. These include Group Digital Transformation & Strategy, Group Banking Operations, Group Markets Operations, Group Information Technology, Group Organisation & Security and Group Delivery Centre. The staff, management and support functions are combined in the Others and Consolidation division for reporting purposes.

On the domestic market, Commerzbank Aktiengesellschaft is headquartered in Frankfurt am Main, from where it manages a nationwide branch network through which all customer groups are served. Its major German subsidiaries are comdirect bank AG and Commerz Real AG. Outside of Germany, the Bank has 6 material subsidiaries, 20 operational foreign branches and 31 representative offices in just under 50 countries and is represented in all major financial centres, such as London, New York, Tokyo, Hong Kong and Singapore. However, the focus of the Bank's international activities is on Europe.

A detailed description of Commerzbank Group is given in the Annual Report 2018.

Objective of the Disclosure Report

This report is intended to give the reader a detailed insight into Commerzbank's current risk profile and risk management. In particular, it contains information on:

- the Commerzbank Group's structure from both a regulatory and accounting perspective,
- the Group's capital structure,
- the Commerzbank Group's general risk management system and
- the risk management in respect of specific types of risk.

The report may also be seen as complementary to the Annual Report pursuant to the German Commercial Code (Handelsgesetzbuch – HGB), since in contrast to the Annual Report it focuses primarily on the supervisory perspective.

In this report Commerzbank Aktiengesellschaft as the ultimate parent company of the regulated banking group is complying with the disclosure requirements of Articles 431 – 455 of regulation (EU) No. 575/2013 – the Capital Requirements Regulation (CRR) and the guidelines on the disclosure requirements under Part Eight of Regulation (EU) No. 575/2013 - EBA/GL/2016/11 - as at 31 December 2018. The tables defined according to the EBA's guidelines and integrated into the report are indicated by the table names provided with the prefix EU.

Fulfilment of the CRR requirements within the Commerzbank Group is presented in detail in the „Overview: Compliance with the CRR requirements“ in the appendix (table ANH6).

Scope

This Disclosure Report is based on the group of companies consolidated for regulatory purposes. The companies consolidated for regulatory purposes only include those carrying out banking and other financial business. The consolidated group consists of a domestic parent company and its affiliated companies. The aim of regulatory consolidation is to prevent multiple use of capital that in fact exists only once by subsidiary companies in the financial sector. The companies consolidated under IFRS, by contrast, comprise all the companies controlled by the ultimate parent company.

In the context of the disclosure requirements (Article 431 (3) CRR), besides the Disclosure Report itself, all policies and processes have to be documented as a main component to fulfil the Pillar 3 requirements of the Basel framework. The appropriateness and practicality of the Bank's disclosure practice has to be reviewed on a regular basis. For this purpose, Commerzbank has defined guidelines for the Disclosure Report which regulate the overarching, strategic part of the instructions. The operative targets and responsibilities are additionally defined in separate documents.

With consolidated total assets that are regularly well in excess of €30bn, Commerzbank is one of the biggest financial institutions in Germany. Hence, independent of the criteria in Article 433 CRR, Commerzbank has implemented the reporting requirements during the period from Q2 2015 on and discloses the quarterly and semi-annually required information as appropriate.[1]

Waiver rule pursuant to Article 7 CRR

Under the waiver rule pursuant to Article 7 CRR in conjunction with section 2a (1) of the German Banking Act (KWG), subsidiary companies in a banking group may apply for exemption from the requirements of Article 6 (1) CRR (on capital, large exposures, exposures to transferred credit risk and disclosure) at single entity level. This is on condition, among other things, that both the parent company and subsidiary are licensed in the same member state and the subsidiary is included in the supervision on a consolidated basis of the parent company.

Exemption is also on condition that there is no current or foreseen material practical or legal impediment to the prompt transfer of own funds or the repayment of liabilities by the parent company, that the parent company guarantees the commitments entered into by the subsidiary, the risk evaluation, measurement and control procedures of the parent company cover the subsidiary, and the parent company holds more than 50% of the voting rights in the subsidiary or can appoint or remove a majority of the members of the management body and can therefore exercise a dominant influence over the subsidiary.[2]

In the case of institutions and parent companies that were already making use of a waiver before the CRR came into effect under the rules of the German Banking Act (KWG) applicable at the time, using the disclosure procedure then specified, exemption is deemed to have been granted under Article 7 CRR and the relevant standards under section 25a (1) sentence 3 KWG (see section 2a (5) KWG).

The waiver rule is used by comdirect bank AG. It is – for instance by virtue of the risk management carried out at Group level (in line with MaRisk) – integrated into the internal processes and risk management of Commerzbank Aktiengesellschaft as the ultimate parent company of the banking group. Among other things this applies to the risk evaluation, measurement and control procedures. Commerzbank Aktiengesellschaft holds 82.3% of the voting rights in comdirect bank AG and guarantees its commitments towards third parties (through letters of comfort).

According to Article 7 CRR in conjunction with section 2a (1) KWG, parent companies within the group of companies consolidated for regulatory purposes are also entitled to this exemption. The opportunity this offers for Commerzbank Aktiengesellschaft as the ultimate parent company of the Commerzbank Group to be exempted from the requirements at single entity level has been utilised since 2007. The conditions for claiming the waiver continue to apply.

Utilisation of the waiver rule was reported at the outset to BaFin and the Bundesbank with evidence of compliance with the requirements and is subsequently monitored and documented on occasion.

[1] See EBA/GL/2014/14, title V (18) and EBA/GL/2016/11 No. 46.
[2] Under Article 7 (1) d) CRR, a dominant influence means either having a majority of voting rights or having the right to appoint a majority of the members of the management body of the subsidiary.

Equity capital, capital requirement and risk-weighted assets

Capital structure

The main rules governing compliance with minimum regulatory capital ratios for solvency purposes in the EU are contained in the Capital Requirements Directive (CRD) IV, the Capital Requirements Regulation (CRR), a European regulation which, unlike the CRD IV Directive, has direct legal effect for all European banks, together with the SSM Regulation (Council Regulation No. 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions). This legislation is supplemented at national level in Germany by further provisions in the German Banking Act, the German Solvency Regulation and other regulations. In addition, Implementing Technical Standards (ITS) and Regulatory Technical Standards (RTS) provide explanations about particularly complex matters. The introduction of the new regulations in 2014 has strengthened the quality of regulatory capital compared with the previous regime, made capital requirements more stringent and set higher minimum requirements for banks' capital adequacy.

To avoid having all these requirements take effect on a single date, certain parts of the new rules are subject to defined phase-in rules. The phase-in for capital deductions ended at the beginning of the 2018 financial year. This means that the remaining phase-in now only takes place in Additional Tier 1 capital and Tier 2 capital, and gradually reduces the recognition of capital issues that are not CRR-compliant.

Common Equity Tier 1 (CET1) capital consists largely of subscribed capital plus reserves and non-controlling interests. Adjustments to this figure may be necessitated by any number of causes, for example goodwill, intangible assets, write-downs of assets (if assets are not valued cautiously enough in the regulator's view), shortfalls due to the comparison of expected losses with the provisions recognised for them and the correction of tax loss carryforwards. Adding Additional Tier 1 capital (AT1), which can contain subordinated debt instruments with certain conditions, produces Tier 1 capital. Tier 2 capital consists largely of subordinated debt instruments which are not eligible as Additional Tier 1 capital. The eligibility of these capital components has been reduced, as over the final five years of their life they may now only be amortised on a straight-line basis.

Commerzbank seeks to achieve the following objectives in managing its capital:

- adherence to the statutory minimum capital requirements at Group level and in all companies included in the regulatory Group,
- ensuring that the planned capital ratios are met, including the new ECB/EBA requirements,
- provision of sufficient reserves to guarantee the Bank's freedom of action at all times,
- strategic allocation of Tier 1 capital to business segments and divisions in order to exploit growth opportunities.

The financial crisis made the importance of adequate CET1 capital levels for banks become an issue of increasing public concern. At Commerzbank, Tier 1 capital has always been a key management target. The Bank's specifications for the capital ratios far exceed the minimum statutory requirements. The Bank's risk-bearing capacity and market expectations play an important role in determining the internal capital ratio targets. For this reason, Commerzbank has stipulated minimum ratios for regulatory capital. CET1 capital is allocated via a regular process that takes account of the Bank's strategic direction, profitable new business opportunities in the core business of each business segment as well as aspects of risk-bearing capacity.

Measures relating to the Bank's capital are approved by the full Board of Managing Directors, subject to the authorisation granted by the annual general meeting. During the past year, Commerzbank met the minimum statutory capital requirements as well as the requirements of the ECB and EBA at all times. In the pro forma calculation of fully phased-in implementation of the CRR requirements, the transitional regulations are completely disregarded. Commerzbank Group does not apply the transitional arrangements set out in article 473a CRR. Information on equity capital, capital ratios and the leverage ratio reflect the full impact of the IFRS 9 introduction.

The evaluations in the tables below comprehensively illustrate the total own funds available for the entire Commerzbank Group. These own funds are also the basis for the calculation of the equity capital adequacy as reported to the Bundesbank. Details of the issued capital instruments of Commerzbank Group according to Article 437 (1) b) and c) CRR are given on the Commerzbank website in the section Debt holder information/Capital instruments. Further information on our leverage ratio according to Article 451 CRR is given in Note (67) (Regulatory capital requirements) and Note (68) (Leverage ratio) in the Annual Report 2018, which is published on our website.

The composition of the regulatory capital and the capital ratios are as follows:

CAP1: Equity structure (basis: EU 1423/2013)

Line €m		A: Amount on the day of disclosure
Common Equity Tier 1 capital: instruments and reserves		
1	Capital instruments and the related share premium accounts	18,444
1a	thereof: subscribed capital	1,252
1b	thereof capital reserve	17,192
2	Retained earnings	9,253
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	–284
3a	Funds for general banking risk	0
4	Amount of qualifying items referred to in Art. 484 (3) and the related share premium accounts subject to phase out from CET1	0
5	Minority interests (amount allowed in consolidated CET1)	758
5a	Independently reviewed interim profits net of any foreseeable charge or dividend	595
6	**Common Equity Tier 1 (CET1) capital before regulatory adjustments**	**28,767**
Common Equity Tier 1 (CET1) capital: regulatory adjustments		
7	Additional value adjustments (negative amount)	–459
8	Intangible assets (net of related tax liability) (negative amount)	–2,835
10	Deferred tax assets subject to future profit ratio excluding those arising from temporary differences (net of related tax liability where the conditions in Art. 38 (3) are met) (negative amount)	–784
11	Fair value reserves related to gains or losses on cash flow hedges	15
12	Negative amounts resulting from the calculation of expected loss amounts	–205
13	Any increase in equity that results from securitised assets (negative amount)	0
14	Gains or losses on liabilities valued at fair value resulting from changes in own credit standing	–220
15	Defined benefit pension fund assets (negative amount)	–307
16	Direct and indirect holdings by an institution of own CET1 instruments (negative amount)	–11
17	Holdings of the CET1 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
18	Direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0
19	Direct, indirect and synthetic holdings by the institution of the CET1 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
20a	Exposure amount of the following items which qualify for a RW of 1250%, where the institution opts for the deduction alternative	–201
20b	thereof: qualifying holdings outside the financial sector (negative amount)	0
20c	thereof: securitisation positions (negative amount)	–199
20d	thereof: free deliveries (negative amount)	–1
21	Deferred tax assets subject to future profit ratio and arising from temporary differences (amount above 10% threshold, net of related tax liability where the conditions in Art. 38 (3) are met) (negative amount)	–453
22	Amount exceeding the 15% threshold (negative amount)	0
23	thereof: direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution has a significant investment in those entities	0
25	thereof: deferred tax assets subject to future profit ratio and arising from temporary differences	0
25a	Losses for the current financial year (negative amount)	0
25b	Foreseeable tax charges relating to CET1 items (negative amount)	0
27	Qualifying AT1 deductions that exceed the AT1 capital of the institution (negative amount)	0
27a	Other CET1 capital elements or deductions	–101
28	**Total regulatory adjustments to Common Equity Tier 1 (CET1) capital**	**–5,560**
29	**CET1 capital**	**23,206**

Line €m		A: Amount on the day of disclosure
Additional Tier 1 (AT1) capital: instruments		
30	Capital instruments and the related share premium accounts	0
31	thereof: classified as equity under applicable accounting standards	0
32	thereof: classified as liabilities under applicable accounting standards	0
33	Amount of qualifying items referred to in Art. 484 (4) and the related share premium accounts subject to phase out from AT1	904
34	Qualifying Tier 1 capital included in consolidated AT1 capital (including minority interests not included in line 5) issued by subsidiaries and held by third parties	0
35	thereof: instruments issued by subsidiaries subject to phase out	0
36	**Additional Tier 1 (AT1) capital before regulatory adjustments**	**904**
Additional Tier 1 (AT1) capital; regulatory adjustments		
37	Direct and indirect holdings by an institution of own AT1 instruments (negative amount)	0
38	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
39	Direct and indirect holdings of the AT1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above 10% threshold and net of eligible short positions) (negative amount)	0
40	Direct and indirect holdings by the institution of the AT1 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
42	Qualifying Tier 2 deductions that exceed the Tier 2 capital of the institution (negative amount)	0
43	**Total regulatory adjustments to Additional Tier 1 (AT1) capital**	**0**
44	**Additional Tier 1 (AT1) capital**	**904**
45	**Tier 1 capital (T1 = CET1 + AT1)**	**24,110**
Tier 2 capital: instruments and provisions		
46	Capital instruments and the related share premium accounts	4,946
47	Amount of qualifying items referred to in Art. 484 (5) and the related share premium accounts subject to phase out from Tier 2	242
48	Qualifying own funds instruments included in consolidated Tier 2 capital (including minority interests and AT1 instruments not included in rows 5 or 34) issued by subsidiaries and held by third parties	282
49	thereof: instruments issued by subsidiaries subject to phase out	0
50	Credit risk adjustments	0
51	**Tier 2 capital before regulatory adjustments**	**5,469**
Tier 2 capital: regulatory adjustments		
52	Direct and indirect holdings by an institution of own Tier 2 instruments and subordinated loans (negative amount)	–80
53	Holdings of the Tier 2 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
54	Direct and indirect holdings of the Tier 2 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)	0
55	Direct and indirect holdings of the Tier 2 instruments and subordinated loans 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
57	**Total regulatory adjustments to Tier 2 capital**	**–80**
58	**Tier 2 capital**	**5,389**
59	**Total capital (TC = Tier 1 + Tier 2)**	**29,499**
60	**Total risk-weighted assets**	**180,498**
Capital ratios and buffers		
61	Common Equity Tier 1 (as a percentage of total risk exposure amount)	12.9
62	Tier 1 (as a percentage of total risk exposure amount)	13.4

Line €m		A: Amount on the day of disclosure
63	Total capital (as a percentage of total risk exposure amount)	16.3
64	Institution specific buffer requirement (CET1 requirement in accordance with Art. 92 (1) (a) plus capital conservation and countercyclical buffer[1] requirements, plus systemic risk buffer, plus systemically important institution (G-SII or O-SII) buffer expressed as a percentage of risk exposure amount)	7.480
65	thereof: capital conservation buffer requirement	1.875
66	thereof: countercyclical buffer requirement	0.105
67	thereof: systemic risk buffer requirement	0
67a	thereof: Global Systemically Important Institution (G-SII) or Other Systemically Important Institution (O-SII) buffer	1.0
68	Common Equity Tier 1 available to meet buffers (as a percentage of risk exposure amount)	8.4
Amounts below the thresholds for deduction (before risk weighting)		
72	Direct and indirect holdings by the institution of capital instruments 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)	636
73	Direct and indirect holdings by the institution of the CET1 instruments of relevant financial sector entities where the institution has a significant investment in those entities (amount below 10% threshold and net of eligible short positions)	274
75	Deferred tax assets subject to future profit ratio, arising from temporary differences (amount below 10% threshold, net of related tax liability where the conditions in Art. 38 (3) are met)	2,366
Applicable caps on the inclusion of provisions in Tier 2		
76	Credit risk adjustments included in Tier 2 in respect of exposures under the standard approach (before application of cap)	0
77	Cap on inclusion of credit risk adjustments in Tier 2 under the standardised approach	289
78	Credit risk adjustments included in Tier 2 in respect of exposures subject to the internal ratings-based approach (before application of cap)	0
79	Cap on inclusion of credit risk adjustments allowable in Tier 2 related to exposures subject to internal ratings-based approach	716
Capital instruments subject to phase-out arrangements		
80	Current cap for CET1 instruments subject to phase-out arrangements	0
81	Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities)	0
82	Current cap on AT1 instruments subject to phase out arrangements	904
83	Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities)	–155
84	Current cap on Tier 2 instruments subject to phase out arrangements	304
85	Amount excluded from Tier 2 due to cap (excess over cap after redemptions and maturities)	0

[1] The geographical breakdown of credit exposures relevant for the calculation of the countercyclical capital buffer is shown in ANH2 in the appendix. It also derives the amount of institution-specific countercyclical capital buffer.

Connection between balance-sheet and regulatory positions

For Commerzbank as a banking group as defined in section 10a KWG and Article 11 CRR the capital relevant to the determination of regulatory capital is based on the consolidated financial statements under FINREP which is prepared based on the Group balance sheet according to IFRS. To reconcile the requirements for regulatory capital with the slightly different amounts reported in the financial statements, capital as determined under IFRS was adjusted with the aid of so-called prudential filters.

There was no under-capitalisation of subsidiaries subject to the deduction method during the period under review. Nor are there any obstacles to the transfer of own funds or the repayment of liabilities in accordance with Article 436 c) CRR between Commerzbank AG and the main subsidiaries in the reporting period.

With Basel 3, the Basel Committee on Banking Supervision published among other things comprehensive rules on the components of shareholders' equity and ratios as well as the management of liquidity risk. The Capital Requirements Directive and Regulation (CRD IV) package of measures, constituting the European implementation of Basel 3, has been in force since 1 January 2014, with the more stringent capital requirements being phased in up to 2019. Numerous supplementary regulations have since been published by the European Banking Authority (EBA) in particular, and these will now gradually enter into force; this will continue in subsequent years. Commerzbank has prepared itself for the more stringent capital adequacy requirements by taking a number of steps.

The reconciliation between the Group's equity reported in the balance sheet and the equity reported for regulatory purposes is shown in the tables CAP2 below.

In table EU LI1, there is in total an immaterial difference of €124.2m between the carrying values according to the group of consolidated companies reported in the balance sheet (column a) and the carrying values according to the regulatory group of consolidated companies (column b). This difference results from the different scopes of consolidation and consolidation methods for accounting and regulatory purposes. The companies where the consolidation methods for accounting and regulatory purposes differ are listed entity by entity in table EU LI3 in the Appendix.

TableEU LI2 shows the main reasons for the differences between the carrying values for financial reporting in the balance sheet and the regulatory risk exposure amounts (exposure in the standard approach and exposure at default in the IRB approach). The carrying values are reconciled to the regulatory risk exposure amounts. Row 1 of table EU LI2 comprises the carrying values of assets and row 2 the carrying values of liabilities for the regulatory group of companies in accordance with the allocation of table EU LI1. Column a of rows 1 and 2 corresponds to the total of column b in table EU LI1 less the total of column g in table EU LI1. Row 3 is the difference between row 1 and row 2.

The target figures to be reconciled (row 9) are the input values for the RWA calculation. The target figure includes both on-balance-sheet and off-balance-sheet positions. With the exception of netting, credit risk mitigation methods (CRM) are not taken into account in the target figure of on-balance-sheet positions. The target figure for market risk is at present not clearly defined in functional terms. In the internal model, risk parameters such as VaR, SVaR and IRC and the RWAs calculated from them are relevant. By contrast, exposure values are not considered separately here for the regulatory reporting. For this reason, a reconciliation of the values for market risk to the exposure taken into account for regulatory purposes has been dispensed within table EU LI2. As a result, no total has been calculated for rows 5 to 9 in column a.

Row 4 "Off-balance-sheet amounts" shows the off-balance-sheet amounts in total and before taking into account credit conversion factors (CCFs) in column a. In columns b (credit risk), d (securitisation risk) and e (market risk), the risk exposure values for the off-balance-sheet positions are calculated after taking into account the corresponding credit conversion factors (CCFs) and credit risk mitigation (CRM) methods to allow a comparison with COREP and with the other tables in the Disclosure Report.

Row 5 "Differences resulting from different netting rules, other than those already included in row 2" shows the effects from the different regulatory netting rules compared with those for accounting purposes, taking into account the netting effect in accordance with row 2. In terms of counterparty credit risk, effects result from derivatives and securities financing transactions (SFTs).

Row 6 "Differences in valuation" discloses the valutation differences between carrying values in the balance sheet and regulatory exposures after taking into account netting effects from row 5. The valuation differences in counterparty credit risk include regulatory add-ons for future risks due to considering wrong-way risk and relevant haircuts for collaterals.

Row 7 "Differences due to the consideration of allowances" shows the value adjustments to the IRBA positions for credit risk and securitisation risk. The carrying values on the balance sheet are net carrying values (after loan loss provisions). Under the IRB approach the risk exposure amount is in general the carrying values in the balance sheet; credit risk adjustments such as valuation allowances are not deducted. Value adjustments deducted from the carrying value of assets when drawing up the financial statements are added back as part of the reconciliation.

Other reconciliation effects not already included in reconciliation rows 5 to 7 are reported in row 8 "Others".

CAP2: Reconciliation of equity as reported in the balance sheet with regulatory capital (EU 1423/2013 / Art. 437 a CRR)

Position €m	Equity IFRS[1]	Equity FINREP[2]	Equity COREP (Phase in)[3]
Subscribed capital	1,252	1,252	1,252
Capital reserve	17,192	17,192	17,192
Retained earnings	9,383	9,446	9,446
Silent participations	0	0	0
Actuarial profits/losses current year	–286	–286	–286
Changes due to the revaluation of own credit risk	96	96	96
Revaluation reserve	–11	–12	–12
Valuation of cash flow hedges	–15	–15	–15
Currency translation reserve	–264	–259	–259
Distributable profit/loss from previous year (after suspension of retained earnings)	0	0	0
Distributable profit/loss from current year	865	846	846
Non-controlling interests	1,200	1,198	1,198
Equity as shown in balance sheet	**29,411**	**29,458**	**29,458**
Effects from debit valuation adjustments			–159
Correction of revaluation reserve			0
Correction to cash flow hedges reserve			15
Correction to phase-in (IAS 19)			0
Correction to non-controlling interests (minority)			–440
Goodwill			–1,507
Intangible assets			–1,328
Surplus in plan assets			–307
Deferred tax assets from loss carryforwards			–784
Shortfall due to expected loss			–205
Prudential valuation			–459
Own shares			–11
First loss positions from securitisations			–199
Advance payment risks			–1
Deduction of offset components of Additional Tier 1 capital (AT1)			0
Deferred tax assets from temporary differences which exceed the 10% threshold			–453
Others and rounding			–415
CET1			**23,206**
Hybrid capital	1,085	1,085	1,085
Not eligible issues			–12
Cap due to Art. 471 CRR			–155
Others, especially hedge accounting, interests, agio, disagio			–15
Additional Tier 1 before deductions			**904**
Deduction of offset components of Additional Tier 1 capital (AT1)			0
Additional Tier 1 after deductions			**904**
Subordinated capital	8,050	8,050	8,050
Decreased offsetting in the last 5 years of residual maturity			–2,371
Not eligible non-controlling interests			–225
Inclusion of capped AT1			155
Others, especially hedge accounting, interests, agio, disagio			–220
Tier 2 before deductions			**5,389**
Shortfall due to expected loss			0
Tier 2 after deductions			**5,389**
Own funds	**38,548**	**38,594**	**29,499**

[1] Equity as shown in balance sheet. [2] Financial reporting, equity as shown in balance sheet, regulatory group of consolidated companies.
[3] Common solvency ratio reporting, regulatory capital.

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

	a	b	c	d	e	f	g
€m	Carrying values as reported in published financial statements	Carrying values under the regulatory scope of consolidation	Carrying values of items				
			Subject to the credit risk framework	Subject to the CCR framework	Subject to the securitisation framework	Subject to the market risk framework	Not subject to capital requirements or subject to deductions from capital
Assets							
Cash on hand and cash on demand	53,914	53,914	53,914	0	0	23,348	0
Financial assets - Amortised Cost	279,137	279,414	253,024	15,701	10,579	74,966	110
Financial assets - Fair Value OCI	26,659	26,223	25,348	0	870	9,666	4
Financial Assets - Fair Value Option	0	0	0	0	0	0	0
Financial Assets - Mandatorily Fair Value P&L	34,073	34,109	4,225	26,754	3,045	33,725	85
Financial Assets - Held for Trading	42,501	42,501	0	38,067	66	37,332	5
Value adjustment on portfolio fair value hedges	199	199	199	0	0	0	0
Positive fair values of derivative hedging instruments	1,457	1,457	0	1,457	0	772	0
Holdings in companies accounted for using the equity method	173	173	173	0	0	0	0
Intangible assets	3,246	3,244	0	0	0	0	3,244
Fixed assets	1,547	1,547	1,547	0	0	0	0
Investment properties	13	13	13	0	0	0	0
Non-current assets held for sale and disposal groups	13,433	13,433	747	4,839	0	12,686	0
Current tax assets	783	783	783	0	0	0	0
Deferred tax assets	3,116	3,114	2,366	0	0	0	748
Other assets	2,119	2,122	1,719	0	0	26	377
Total assets	**462,369**	**462,244**	**344,057**	**86,818**	**14,560**	**192,520**	**4,573**
Liabilities and equity							
Financial Liabilities - Amortised Cost	346,668	346,531	0	10,111	0	54,279	336,419
Financial Liabilities - Fair Value Option	21,949	21,931	0	18,973	0	20,249	2,957
Financial Liabilities - Held for Trading	43,404	43,404	0	40,249	0	41,604	14
Value adjustment on portfolio fair value hedges	532	532	0	0	0	0	532
Negative fair values of derivative hedging instruments	1,462	1,462	0	1,462	0	520	0
Provisions	3,153	3,151	0	0	0	0	3,151
Current tax liabilities	472	473	0	0	0	0	473
Deferred tax liabilities	20	18	0	0	0	0	18
Liabilities of disposal groups	12,914	12,914	0	4,618	0	5,013	3,753
Other liabilities	2,384	2,373	0	0	0	0	2,373
Equity	29,411	29,457	0	0	0	0	29,457
Total liabilities and equity	**462,369**	**462,244**	**0**	**75,414**	**0**	**121,664**	**379,147**

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

		a	b	c	d	e
	€m	Total	Items subject to			
			Credit risk framework	CCR framework	Securitisation framework	Market risk framework
1	Assets carrying value amount under the regulatory scope of consolidation (as per template LI1)	457,671	344,057	86,818	14,560	192,520
2	Liabilities carrying value amount under the regulatory scope of consolidation (as per template LI1)	83,912	0	75,414	0	121,664
3	Total net amount under the regulatory scope of consolidation	373,759	344,057	11,404	14,560	70,856
4	Off-balance-sheet amounts	116,858	82,240	0	2,471	20,688
5	Differences due to different netting rules, other than those already included in row 2		0	6,906	0	
6	Differences in valuations		0	7,994	0	
7	Differences due to the consideration of allowances		2,334	0	24	
8	Others		859	0	0	
9	Exposure amounts considered for regulatory purposes		429,490	26,304	17,055	

Capital requirement and RWA

The capital requirements set out below relate to the Commerzbank Group and the figures are the same with regard to content as in the capital adequacy reports submitted to the Deutsche Bundesbank under Basel 3 Pillar 1.

Capital requirements by risk type

Of the overall capital requirement 74.4% relates to default risk positions (excluding counterparty credit risk). Commerzbank uses the Advanced Internal Ratings Based Approach (advanced IRBA; in the following referred to as IRBA) to determine the regulatory capital required. Article 150 CRR gives the option of partial use. The Standardised Approach to Credit Risk (SACR) may be used for part of the portfolios.

The Commerzbank Group and accordingly the group companies included in the disclosure are, as IRBA banks as defined in Article 148 (5) CRR, generally obliged to value investments in accordance with the IRBA rules. For investments entered into prior to 1 January 2008, Commerzbank has opted to apply grandfathering. These investment positions are temporarily excluded from the IRBA and treated in accordance with the SACR rules. They are given a risk weighting of 100%. The CRR also allows items to be permanently exempted from the IRBA. Since 31 December 2009 Commerzbank has applied the option pursuant to section 70 sentence 1 no. 9b of the German Solvency Regulation (SolvV) and Article 150 CRR. All investment positions which do not fall under the above-mentioned temporary grandfathering option are valued using the permanent partial use according to the SACR.

Of the overall capital requirement 7.1% relates to counterparty credit risk. Based on the EBA requirements, credit value adjustments (CVAs) are also assigned to this credit risk category

Securitised positions in the banking book are also shown as a seperate credit risk category subject to a capital requirement in the table EU OV1 below (1.4% of total capital requirement). Commerzbank treats these according to the IRBA and SACR rules for securitised positions. Capital deduction items of securitisations directly reduce the liable equity and thus are not included in the capital requirements.

Pursuant to Article 92 (3) b) and c) CRR, adequate capital must be set aside for market risk positions. As at 31 December 2018, capital requirements here are 5.0% of total requirements. Commerzbank uses an internal market risk model to calculate the regulatory capital requirement. This affects both the equity price and interest rate-related risk positions in the trading book as well as the total of currency positions and commodity positions. The standardised approaches are applied for smaller units in Commerzbank Group in accordance with the partial use option.

To calculate the capital adequacy requirement for operational risks, Commerzbank uses the advanced measurement approach (AMA). This risk category accounts for 11.9% oft he total capital requirements.

EU OV1: Overview of RWAs

€m			Risk weighted assets (RWAs)		Capital requirements
Article in CRR			**31.12.2018**	**30.09.2018**	**31.12.2018**
	1	Credit risk (excluding CCR)	134,328	131,964	10,746
438 (c) (d)	2	Of which the standardised approach	20,943	20,739	1,675
438 (c) (d)	3	Of which the foundation IRB (FIRB) approach	0	0	0
438 (c) (d)	4	Of which the advanced IRB (AIRB) approach	113,385	111,225	9,071
438 (d)	5	Of which equity IRB under the simple risk-weighted approach or the IMA	0	0	0
107, 438 (c) (d)	6	CCR (counterparty credit risk)	12,739	13,107	1,019
438 (c) (d)	7	Of which mark to market	1,638	1,553	131
438 (c) (d)	8	Of which original exposure	0	0	0
	9	Of which the standardised approach	0	0	0
	10	Of which internal model method (IMM)	7,635	7,279	611
438 (c) (d)	11	Of which risk exposure amount for contributions to the default fund of a CCP	14	214	1
438 (c) (d)	12	Of which CVA	3,451	4,060	276
438 (e)	13	Settlement risk	0	5	0
449 (o) (i)	14	Securitisation exposures in the banking book (after the cap)	2,461	2,570	197
	15	Of which IRB approach	1,543	1,629	123
	16	Of which IRB supervisory formula approach (SFA)	538	576	43
	17	Of which internal assessment approach (IAA)	703	711	56
	18	Of which the standardised approach	918	941	73
438 (e)	19	Market risk	8,944	8,381	715
	20	Of which the standardised approach	1,533	1,046	123
	21	Of which IMA	7,410	7,335	593
438 (e)	22	Large exposures	0	0	0
438 (f)	23	Operational risk	21,393	21,685	1,711
	24	Of which basic indicator approach	0	0	0
	25	Of which the standardised approach	0	0	0
	26	Of which advanced measurement approach	21,393	21,685	1,711
437 (2), 48, 60	27	Amounts below the thresholds for deduction (subject to 250% risk weight)	633	649	51
500	28	Floor adjustment	0	0	0
	29	**Total**	**180,498**	**178,360**	**14,440**

Risk-weighted assets were €180.5bn as at 31 December 2018, €2.1bn above the previous quarter's level and €9.1bn above the year-end 2017 level. The increase as compared to the previous year was mainly caused by a growth-driven rise in risk-weighted assets from credit risks, which was only slightly offset by reductions from IFRS 9 adjustments and a further reduction of wind-down portfolios. The overviews of the trend of risk-weighted assets (RWA) by main drivers EU CR8: RWA flow statements of credit risk exposures under the IRB approach, EU CCR7: RWA flow statements of CCR exposures under the IMM as well as EU MR2-B: RWA flow statements of market risk exposures under the IMA are given in the chapters on the respective risk types.

Risk-oriented overall bank management

Commerzbank defines risk as the danger of possible losses or profits foregone due to internal or external factors. In risk management, we normally distinguish between quantifiable and non-quantifiable types of risk. Quantifiable risks are those to which a value can normally be attached in financial statements or in regulatory capital requirements, while non-quantifiable risks, for example, include reputational and compliance risk.

Risk statement

According to Article 435 (1) e) and f) CRR, the risk statement is a declaration approved by the management body providing assurance that the risk management systems put in place are adequate and giving a description of the institution's general risk profile associated with the business strategy. The approval by the Board of Managing Directors was given together with the approval of the Disclosure Report.

Commerzbank considers itself to be a fair and competent bank that wants to be a long-term, reliable partner for its customers. We base our actions on the highest ethical values, integrity and fairness and are committed to complying with all applicable laws, guidelines and market standards. For us, this is the basis on which we work in a relationship of trust with our corporate clients, institutional clients, partners and stakeholders. "The bank at your side" – everything Commerzbank does is measured against this promise, and the Bank has very clearly demonstrated its commitment in this area over recent years.

The Commerzbank 4.0 strategy continues this path into the future. The objective is higher profitability on a sustained basis and increased competitiveness. Commerzbank is continuing to develop its business model as client expectations in the digital era change. Commerzbank is transforming itself into a digital enterprise in order to speed up service provision for customers while considerably improving efficiency and cost-effectiveness within the Bank.

Commerzbank concentrates on two strong customer segments: "Private and Small-Business Customers" and "Corporate Clients". This means we focus on our strength: advising our customers, personally and digitally. At the same time, we are concentrating on our core competences and seizing the opportunities of digitalisation to become better, faster and more innovative. The Bank is focusing on areas where it delivers particular added value to its customers, thereby setting itself apart from the competition; at the same time, it is systematically giving up businesses that do not fit with the strategic orientation.

Our portfolio is already clearly dominated by default risks, which account for 73% of economically required capital, with market risk accounting for 23%. Our two main markets, Germany and Poland, in turn account for 64% of the credit exposure

The Group Risik Strategy, together with the business strategy, regulates the strategic risk management guidelines for the development of Commerzbank's investment portfolio. This takes into account exogenous factors, such as risks from the macroeconomic environment, and endogenous factors, in particular the results of the annual risk inventory. In the risk inventory process, all economically significant quantifiable and unquantifiable risks arising from our business activities are assessed in terms of their materiality for risk management. Those risks assessed as being material are included in the Group Risk Strategy, and their management is further specified and operationalised in separate sub-risk strategies and policies. The annual update of the risk-bearing capacity concept ensures, that the main types of risk are adequately taken into account in the risk-bearing capacity calculation. The scope and management of credit risk, counterparty credit risk, securitisations, market risk, liquidity risk and operational risk are presented in the relevant chapters of this report. The chapter "Other risks" provides information on other types of risk classified as material.

Risk appetite, determined by Group Risk Strategy, refers to the maximum risk, in terms of both the amount and structure, which the Bank is willing and able to incur in pursuing its business objectives, without exposing itself to existential threats (risk tolerance). The guiding principle regarding risk appetite is to ensure that the Commerzbank Group has sufficient capital and liquidity resources on a sustained basis. Banks' core functions as transformers of liquidity and risk result in inevitable threats that can in extreme cases endanger the continued existence of the institution. For Commerzbank, in view of its business model, these inherent existential threats include the default of Germany, Poland, one or more of the other major EU countries (France, Italy, Spain or the UK, although Brexit is not deemed to be a default) or the default of the USA. Others include a deep recession lasting several years with serious repercussions for the German economy, a bank run and the collapse of global clearing houses or the foreign exchange markets, possibly triggered by a cyber attack. In general, cyber risk is an inherent, existential risk for Commerzbank in the context of increasing digitalisation.

Risk appetite is quantified in terms of risk limits and escalation mechanisms for capital and liquidity management, and by means of comprehensive early warning systems. Limits and guidelines are broken down across the risk types, segments and portfolios. They form an integral part of ongoing management and monitoring. In addition, regular portfolio-specific stress tests are also carried out.

A key component of liquidity risk management is the daily calculation of the liquidity gap profile. The liquidity gap profile shows the deterministic or stochastic inflows and outflows expected in the future on a given reporting date and across all portfolios. This forms the basis for calculating liquidity requirements or excess liquidity per maturity band. Based on the liquidity gap profile, management mechanisms such as recovery and early warning indicators are limited and monitored accordingly. The liquidity gap profile is limited in all maturity bands. The Group limits are broken down into individual Group units and currencies.

The regulatory LCR is contained in the internal liquidity risk model as a binding secondary condition. In 2018, Commerzbank significantly exceeded the minimum ratio of 100% stipulated for that year on every reporting date. As at the end of 2018, the average month-end value of the LCR over the last twelve months was 135.66%. The net stable funding ratio (NSFR) is due to be transposed into European law by the Basel Committee as part of the Capital Requirements Regulation II (CRR II). Commerzbank is already calculating both ratios as part of its regulatory reporting processes, communicating them in its internal reporting and reporting them to the supervisory authority. In addition, under Basel 3 the leverage ratio is used as a non-risk-sensitive indicator of leverage. At 31 December 2018, the leverage ratio came to 5.0% after taking into account the CRR transitional rules (phase in) and to 4.8% after full application of the revised CRR rule (fully phased in). Avoiding the risk of excessive leverage is an integral part of Commerzbank's management of its balance sheet.

To ensure an adequate capital backing, compliance with economic risk-bearing capacity requirements and the regulatory capital ratios is reviewed by means of an early warning system in both a forecast scenario and an adverse scenario. This is based on a gone concern approach aimed at protecting unsubordinated lenders. The approach is supplemented by scenarios aimed at ensuring the institution's continuing existence (going concern perspective).

Our Common Equity Tier 1 ratio was 12.9% at the end of 2018. In terms of the Common Equity Tier 1 ratio (fully phased-in), in future Commerzbank will focus more closely on the capital requirements arising from the Supervisory Review and Evaluation Process (SREP). At the end of 2018, the regulator, the European Central Bank (ECB), praised the progress made by Commerzbank in improving its risk profile. Consequently, it set the minimum Common Equity Tier 1 ratio resulting from the SREP one-quarter of a percentage point lower for 2019. The success in reducing risks and the size of the balance sheet in recent years has also resulted in the German regulator leaving the capital buffer for other systematically important institutions (O-SIIs) at 1.0% for 2019, delaying the increase to 1.5% which had been planned. Our own ambition for the Common Equity Tier 1 ratio at the end of 2019 is at least 12.75%. The risk-bearing capacity (RBC) ratio of 193% (target: >100%) comfortably meets risk-bearing capacity requirements.

The risk result relating to the Group's lending business in 2018 amounted to €–446m. Compared with the previous year the calculation of the risk result showed substantial changes due to the conversion to IFRS 9. Details are given in Commerzbank Group's Annual Report 2018 in the chapter "Default risk". The risk result of the third and fourth quarters of 2018, with loan loss provisions of €133m and €154m respectively projected for a full year, is in line with a normalised level. From the present perspective, the risk result for the year 2019 as a whole will therefore not be less than €550m.

Comprehensive, prompt, transparent and methodically adequate risk measurement is vital for ensuring that the Commerzbank Group has sufficient liquidity and capital resources on a permanent basis. Our business and risk strategy is made measurable, transparent, and controllable by the processes used. The risk measurement methods and models that we use comply with the latest common banking industry standards and are regularly reviewed by risk control, internal audit, our external auditors and the German and European supervisory authorities. The processes ensures that our risk-bearing capacity and our ability to meet financial obligations at all times are maintained on a lasting basis. We consider our risk management methods and processes to be appropriate and effective.

Risk management organisation

Commerzbank regards risk management as a task for the whole Bank. The Chief Risk Officer (CRO) is responsible for developing and implementing the Group's risk policy guidelines for quantifiable risks, laid down by the Board of Managing Directors, as well as for measuring these risks. The CRO regularly reports to the full Board of Managing Directors and the Supervisory Board's Risk Committee on the overall risk situation within the Group. The Risk Committee met five times in 2018.

The risk management organisation comprises Credit Risk Management, Intensive Care, Market Risk Management as well as Risk Controlling and Capital Management. In all segments except for Asset & Capital Recovery (ACR), credit risk management is separated into a performing loan area and Intensive Care, while in ACR it has been merged into a single unit across all rating classes. All divisions have a direct reporting line to the CRO.

It is Group Compliance's responsibility to establish appropriate governance, procedures and systems to avoid the Bank being unintentionally endangered as a consequence of compliance risks. This includes the risks associated with money laundering, terrorist financing, sanctions and embargoes, markets compliance, and fraud and corruption. Group Compliance is led by the Chief Compliance Officer, who reports directly to the member of the Board of Managing Directors with responsibility for Group Compliance.

The full Board of Managing Directors has exclusive responsibility for fundamental strategic decisions. The Board of Managing Directors has delegated operative risk management to committees. Under the relevant rules of procedure, these are the Group Credit Committee, the Group Market Risk Committee, the Group OpRisk Committee and the Group Strategic Risk Committee, which decides on risk issues of an overarching nature. The CRO chairs all these committees and has the right of veto. The CRO is also a member of the central Asset Liability Committee.

Further details on the risk management organisation can be found in the Risk Report in the Annual Report 2018.

Risk strategy and risk management

The Group Risik Strategy, together with the business strategy, regulates the strategic risk management guidelines for the development of Commerzbank's investment portfolio. It defines the risk appetite as the maximum risk that the Bank is prepared and able to accept while following its business objectives without exposing itself to existential threats over and above the risks inherent in the business. The guiding idea is to ensure that the Group holds sufficient liquidity and capital. Based on these requirements, suitable limits for the risk resources capital and liquidity available to the Group are defined. The overarching limits of the Group Risik Strategy are consistent with the indicator thresholds of the recovery plan.

Banks' core functions as transformers of liquidity and risk result in inevitable threats that can in extreme cases endanger the continued existence of the institution. For Commerzbank, in view of its business model, these inherent existential threats include the default of Germany, Poland, one or more of the other major EU countries (France, Italy, Spain or the UK, although Brexit is not deemed to be a default) or the default of the USA. Italy has an idiosyncratic special position on account of the large legacy exposure to the Italian state, whereas in the case of the other countries the existential threat would result from the effects of a state default on the banks and companies and the implications for the other EU countries. Others include a deep recession lasting several years with serious repercussions for the German economy, a bank run and the collapse of global clearing houses or the foreign exchange markets, possibly triggered by a cyber-attack. In general, cyber risk is an inherent, existential threat for Commerzbank in the context of increasing digitalisation in the business environment.

When pursuing its business targets, the Bank accepts these existential threats. It may be necessary to adjust the business model and hence the business and risk strategies in the medium and long term if the full Board of Managing Directors' assessment of these threats to Commerzbank changes substantially. To the extent that it is able to do so, Commerzbank makes early preparations in anticipation of forthcoming changes in regulatory requirements and accounting standards. Such changes and their (retrospective) interpretation may have lasting implications for – and even threaten the survival of – Commerzbank's business model. Commerzbank takes these "regulatory risks" into account because there are many cases where there is no option to mitigate or manage them.

The Group Risik Strategy covers all material risks to which Commerzbank is exposed. It is updated on an ad hoc basis if necessary, detailed further in the form of sub-risk strategies for the risk types which are material. These are then specified and made operational through policies, regulations and instructions/guidelines. By means of the risk inventory process – which has to be carried out beforehand – Commerzbank ensures that all risks of relevance to the Group are identified and their materiality is assessed. The assessment of the materiality of a risk is based on whether its occurrence could have a major direct or indirect negative impact on the Bank's risk-bearing capacity.

As part of the planning process, the Board of Managing Directors decides the extent to which the risk coverage potential of the Group should be utilised. On that basis, individual types of quantifiable risk contributing to the capital demand are limited in a second stage. A capital framework is allocated to the management-relevant units through the planning process. Compliance with limits and guidelines is monitored during the year, and management measures are put in place where required. In addition, further qualitative and quantitative early warning indicators are established in the Group Risik Strategy. Potential negative developments can be identified at an early stage with the help of these indicators.

One of the primary tasks of risk management is the avoidance of risk concentrations. These can arise from the synchronous movement of risk positions both within a single risk type (intra-risk concentrations) and across different risk types (inter-risk concentrations). The latter result from common risk drivers or from interactions between different risk drivers of different risk types.

By establishing adequate risk management and controlling processes, Commerzbank provides for the identification, assessment, management, monitoring and communication of material risks and related risk concentrations. This ensures that all Commerzbank-specific risk concentrations are taken into account in its risk management. Stress tests are regularly used to ensure transparency regarding risk concentrations. The design of the scenarios, and the procedure as a whole, ensure that the effects of adverse scenarios on the portfolio emphases and risk concentrations are systematically analysed. Management is regularly informed about the results of the analyses so that the potential risk of losses can be avoided in good time.

The Group Risk & Capital Monitor is the monthly, controlling-oriented risk report for capital, credit risk, market risk, liquidity and OpRisk related subjects of Commerzbank's risk management. It shows all the above risk types, including economic and regulatory risk-bearing capacity, for the Commerzbank Group. The report's aims include providing the full Board of Managing Directors and the Supervisory Board's Risk Committee with transparent and comprehensive information, highlighting important developments from a risk perspective and setting management measures. Particularly, limits and guidelines of the Group Risk Strategy are monitored by the report. The Group Risk Strategy and the Group Risk & Capital Monitor are approved by the full Board of Managing Directors.

Commerzbank has adopted a code of conduct that defines binding minimum standards for Commerzbank's corporate responsibility, its dealings with customers, business partners and colleagues, and its day-to-day business. It goes without saying that the Bank complies with relevant laws, regulatory requirements, industry standards and internal rules, and this therefore forms a particularly important part of its risk culture. It actively demands appropriate and courageous conduct and integrity of behaviour in compliance with rules, and any failure to comply with rules is penalised. Expansions of procedures ensure that misconduct is assessed in a standardised and fair manner and thus strengthen the management of consequences on a sustained basis.

The main pillar of the Bank's overall risk management and culture is the concept of "three lines of defence", which is a core element of the Corporate Charter. Under this three lines of defence principle, protecting against undesirable risks is an activity that is not restricted to the risk function. Each unit (segment or function) forms the first line of defence within its area of operational responsibility and is responsible for identifying and managing risks within it while complying with the prescribed risk standards and policies. For example, the front office forms the first line of defence in all business decisions and has to take risk aspects into account in reaching them. The second line of defence for each type of risk lays down standards for appropriate management of risks of that type, monitors this and ensures the application of such standards, and analyses and evaluates the risks. The risk function forms the second line of defence against credit and market risks associated with business decisions. Particularly for credit risk, this includes involvement in the credit decision process through means of a second vote. Units outside the risk function (e.g. Group Compliance and Group Finance) also operate as the second line of defence for certain risk types. The third line of defence is internal audit.

Under the provisions of the Remuneration Ordinance for Institutions (Institutsvergütungsverordnung), every year Commerzbank identifies, in a regular process, those employees whose actions have a material impact on Commerzbank's overall risk profile (risk takers). These risk takers are identified in accordance with regulatory requirements on the basis of their function within the organisation (including management level) and their function-related activities. Special regulations apply to risk takers as regards measuring their performance and the manner in which their variable remuneration is paid out. Information in relation to the remuneration system of Commerzbank Group according to Article 450 CRR can be found in the Remuneration Report within the Annual Report 2018 and in the separate Remuneration Report on the internet pages of Commerzbank.

Information on corporate governance according to Article 435 (2) CRR is provided in the Annual Report 2018 (Corporate Governance Report) and on the internet pages of Commerzbank.

Information on the indicators of global systemic importance according to Article 441 CRR is given in a separate disclosure on the internet pages of Commerzbank in the section Bondholder information/Transparency disclosures.

Risk-bearing capacity and stress testing

Risk-bearing capacity analysis is a key part of overall bank management and Commerzbank's ICAAP. The purpose is to ensure that sufficient capital is held at all times.

Commerzbank monitors risk-bearing capacity using a gone concern approach which seeks primarily to protect unsubordinated lenders. This objective should be achieved even in the event of extraordinarily high losses from an unlikely extreme event. The gone concern analysis is supplemented here by elements aimed at ensuring the institution's continuing existence (going concern perspective).

When determining the economically required capital, allowance is made for potential unexpected fluctuations in value. Where such fluctuations exceed forecasts, they must be covered by the available economic capital to absorb unexpected losses (economic risk coverage potential). The quantification of the economic risk coverage potential is based on a differentiated view of the accounting values of assets and liabilities and involves economic valuations of certain balance sheet items.

The capital requirement for the risks taken is quantified using the internal economic capital model. When assessing the economic capital required, allowance is made for all the types of risk at the Commerzbank Group that are classified as material and quantifiable in the annual risk inventory. The economic risk approach therefore also comprises risk types that are not included in the regulatory requirements for banks' capital adequacy. The model also reflects diversification effects incorporating all types of risk. The confidence level of 99.91% in the economic capital model is in line with the underlying gone concern assumptions and ensures the economic risk-bearing capacity concept is internally consistent. The quantifiable risks in the economic capital model can be divided into default risk, market risk, operational risk and – although not shown separately in table RBC1 below – business risk, physical asset risk, investment portfolio risk, deposit model risk and reserve risk. Business risk is the risk of a potential loss resulting from discrepancies between actual income and expense and the respective budgeted figures. Business risk is considered as a deductible amount in risk coverage potential. Investment portfolio risk indicates the risk of an unexpected fall in the value of unlisted investments. Physical asset risk is the risk of an unexpected fall in the value of owned property which is either already booked as an asset in the Group's balance sheet or which can be capitalised during the next twelve months by contractually assured obligations with option character (especially real estate). Deposit model risk is the risk arising from the deposit model used by Commerzbank and from modelling unscheduled repayment rights in commercial credit business. Reserve risk is the risk of additional charges being incurred on the portfolio of loans already in default through the creation of additional loan loss provisions. Allowance is made for this risk when considering risk-bearing capacity by means of a risk buffer. The results of the risk-bearing capacity analysis are shown using the risk-bearing capacity ratio (RBC ratio), indicating the excess of the risk coverage potential in relation to the economically required capital.

The risk-bearing capacity is monitored and managed monthly at Group level. Risk-bearing capacity is deemed to be assured as long as the RBC ratio is higher than 100%. In 2018, the RBC ratio was consistently above 100% and stood at 193% on 31 December 2018. The decline in the RBC ratio was due to the risk coverage potential, which fell compared to December 2017, mainly owing to the introduction of IFRS 9, residual maturity effects of subordinated capital and the market-related portfolio performance in the Public Finance portfolio. The RBC ratio continues to be at a high level.

RBC1: Group's risk-bearing capacity

Risk-bearing capacity Group | €bn	31.12.2018	31.12.2017
Economic risk coverage potential[1]	**27**	**30**
Economically required capital[2]	**14**	**14**
thereof for credit risk	10	10
thereof for market risk[3]	3	3
thereof for operational risk	2	2
thereof diversification effects	–2	–2
RBC ratio[4]	**193%**	**217%**

[1] Including potential deductible amounts for business risk.
[2] Including physical asset risk, risk of unlisted investments and reserve risk.
[3] Including deposit model risk.
[4] RBC ratio = economic risk coverage potential/economically required capital (including risk buffer).

Commerzbank uses macroeconomic stress tests to review the risk-bearing capacity in the event of assumed adverse changes in the economic environment. The scenarios on which they are based take into account the interdependence in development between the real and financial economies and extend over a time horizon of at least two years. They are updated quarterly and approved by the Asset Liability Committee (ALCO). The scenarios describe an extraordinary but plausible adverse development in the economy, focusing in particular on portfolio priorities (e.g. export-based sectors in Germany) and business strategies of relevance to Commerzbank. The scenario simulation is run monthly at Group level using the input parameters of the economic capital requirements calculation for all material and quantifiable risk types. In addition to the capital required, the income statement is also subjected to a stress test based on the macroeconomic scenarios. Based on this, changes in the risk coverage potential are simulated. Whereas the RBC ratio is embedded into Commerzbank's limit system, guidelines for risk-bearing capacity are set as an early warning system in the stressed environment. The ongoing monitoring of the limits and guidelines is a key part of internal reporting. Defined escalations are triggered if the limit is breached.

The risk-bearing capacity and stress testing concept is subject to an annual internal review and is refined on an ongoing basis. The development of the regulatory environment is also taken into account. The ECB published revised ICAAP and ILAAP guidelines on 9 November 2018. Commerzbank will adapt its risk tolerance and stress testing concept to the new requirements from 2019. The economic approach will evolve from a gone-concern approach to a going-concern approach in the process.

In addition to the regular stress tests, reverse stress tests are implemented annually at Group level. Unlike regular stress testing, the result of the simulation – a sustained threat to the Bank – is determined in advance. The aim of the analysis process in the reverse stress test is to improve the transparency of Bank-specific risk potential and interactions of risk by identifying and assessing extreme scenarios and events. On this basis, for instance, action areas in risk management including the regular stress tests can be identified and taken into account in the ongoing development efforts.

In addition to the Bank's internal stress test of economic risk-bearing capacity, Commerzbank also once again participated in the EU-wide stress test of the European Banking Authority (EBA) and significantly improved its result compared to the previous stress test in 2016. In the stress test's adverse scenario, the Core Tier 1 ratio (CET1) was 9.9% as at the end of the period under review in 2020. This represents an improvement of 2.5 percentage points compared to the previous test in 2016. Overall, the stress effect reduced the CET1 ratio of 13.3% (full application of Basel 3 including the new IFRS 9 accounting rules at the turn of the year 2017/18) by 3.4 percentage points. The ratio in 2016 had been reduced by 4.7 percentage points in the adverse stress scenario.

A. Credit risk (CR)

Credit risk (default risk from credit risk) (CR) is defined as the risk of losses sustained or profits foregone due to the default of a counterparty. It is a quantifiable material risk and includes the material sub-risk types of credit default risk, issuer risk, country and transfer risk, dilution risk and reserve risk. The default risk from counterparty risk is shown separately in the section on counterparty credit risk in this report.

Risk management

Strategy and organisation

The credit risk strategy is the sub-risk strategy for default risks and is derived from the group risik strategy. It is embedded in the ICAAP process of the Commerzbank Group and forms a link between the Bank's overall risk management across all risk types and the operationalisation of default risk management. The overriding aim is to ensure the adequate portfolio quality of the credit portfolio. To this end, the credit risk strategy defines the credit risk tolerance, specifies risk strategy priorities, provides an overview of the material credit risk management concepts and thereby plays an integral part in maintaining the Group's risk-bearing capacity. The credit risk strategy makes use of quantitative and qualitative management tools that give decision-makers clear guidance on both portfolio management and decisions in specific cases.

Credit risk management is a joint task of the front office and the risk function, based on a standardised Group-wide credit risk culture and with a focus on responsible actions. Impeccable moral and ethical conduct in compliance with the law and regulations is a key element of a culture of integrity and core to the credit risk culture. Default risks are assessed against uniform standards, regardless of segment limits. In line with the three lines of defence principle, the front office is the first line of defence and must take risk aspects into account when taking business decisions. The risk function is the second line of defence (back office and risk controlling), its fundamental task being to manage, limit and monitor risks. The third line of defence is internal audit. It is tasked with independently auditing the Bank's processes and safety precautions, and as such also assesses the activities of the first and second lines of defence.

The Group Credit Committee is the highest decision-making committee for operative credit risk management, comprising two representatives each from the back office and front office. It takes decisions in line with the competencies delegated to it by the full Board of Managing Directors and is responsible for managing all credit risks. In so doing, the Group Credit Committee operates on the basis of the valid credit risk strategy. Reporting to the Group Credit Committee are sub-credit committees, which operate on the basis of their respective rules of procedure and within the competencies approved by the full Board of Managing Directors. They comprise at least two representatives from the segments and two representatives from Group Risk Management. The sub-credit committees are generally in charge of managing all credit risks of the sub-portfolios they take responsibility for and are authorised to further delegate specific credit decisions in accordance with their competencies

Discrete back-office areas are responsible for operational credit risk management at portfolio level and on a case-by-case basis. The responsibilities are separated between the performing loan area on the one hand and Intensive Care on the other. All credit decisions in the performing loan area are risk/return decisions. The front and back office take joint responsibility for risk and return from an exposure, with the front office having primary responsibility for the return, and the back office for the risk. Accordingly, neither office can be overruled in its primary responsibility in the credit decision process.

Higher-risk customers in the Corporate Clients and the Private and Small-Business Customers segments are handled by specialist Intensive Care areas. The customers are moved to these areas as soon as they meet defined criteria for assignment or mandatory transfer. The principal reasons for assignment to Intensive Care areas are criteria relating to number of days overdrawn, together with event-related criteria such as rating, third-party enforcement measures or credit fraud. Intensive Care decides on further action based on the circumstances of individual cases. Customers must be transferred to Intensive Care if they are in default (for example due to insolvency). This graduated approach ensures that higher-risk customers can continue to be managed promptly by specialists in a manner appropriate to the risks involved and in defined standardised processes.

In the run-off segment ACR, by contrast, there is no separation of responsibilities between the performing loan area and Intensive Care. Credit risk management here has been merged into one unit across all rating classes.

The aim is to fully wind down all the assets grouped in this segment in a way that preserves value. To this end, EaD-based guidelines have been established and an asset management programme has been implemented. This is carried out through regular asset planning. The main aim here is to prioritise the winding down or reduction of those parts of the portfolio and individual loans for which the capital requirement is particularly high. Opportunities for selling sub-portfolios in a way that preserves value may also be used to free up capital as part of the systematic portfolio reduction. For business in Public Finance, the reduction is primarily through regular maturities of assets. Market opportunities that arise are used in a targeted way for the sale of individual assets.

Risk management

Commerzbank manages default risk using a comprehensive risk management system. The management framework comprises an organisational structure, methods and models, quantitative and qualitative management tools and regulations and processes. The risk management system ensures that the entire portfolio and the sub-portfolios, down to individual exposure level, are managed consistently and thoroughly on a top-down basis.

The ratios and measures required for the operational process of risk management are based on the overarching Group objectives. The principle of maintaining a low-risk profile in all business decisions is closely combined here with the risk function's aim of providing the front office with appropriate support. The Bank's particular preference is for credit growth in granular credit business with good credit ratings. It also prefers business and products with low complexity and pays attention to the responsiveness of credit lines and exposures.

Quantitative credit risk strategy guidelines limit risks with regard to poorer credit ratings and exposures with high loss-at-default contributions (concentration management) and for selected sub-portfolios with a high risk weight or regulatory importance, and, as applicable, for individual products with a high portfolio weight. Detailed arrangements for operationalising the guidelines for selected sub-portfolios are set out in separate portfolio policies. In addition, qualitative management guidelines in the form of credit policies define the target business of the Bank. At the level of individual transactions, they regulate the transaction type with which the risk resources provided are to be used. These credit policies are firmly embedded in the credit process: transactions which do not meet the requirements are escalated through a fixed competence regulation.

Group-wide guidelines are based on risk-oriented analyses of trends (for instance, the changes in weaker credit ratings over time) combined with an assessment of overall conditions and internal rules. Risk-oriented portfolio analyses (e.g. the rating profile of individual asset classes) are used in particular to derive portfolio guidelines. Trend analyses of product-specific risk drivers (for example, the loan to value ratio in retail mortgage financing) are key factors for determining product guidelines. In contrast, credit and portfolio policies are primarily produced through a multi-level coordination process involving the product and portfolio managers from the front and back offices, combined with an assessment of internal and external information sources.

To monitor compliance with credit risk strategy rules, continuous monitoring and reporting has also been set up at whole Group level and at segment or sub-portfolio level. Asset quality reviews by the risk function make an important contribution here to quality assurance and early risk detection. The key aspects of monitoring vary according to the subject matter and target audience, and ad-hoc reporting processes are in place. In addition, crisis events may pose a risk to the adequacy of the Bank's capital and liquidity resources and thereby to its risk-bearing capacity. In a crisis, the Risk Mitigation Task Force will manage decisions flexibly in a coordinated, Group-wide process. As part of the process, emergency action plans ensure that risk-mitigation measures are implemented quickly and efficiently.

The avoidance of risk concentrations is a core strategy of risk management. Risk concentrations are actively managed in order to identify at an early stage and contain the increased potential for loss in the synchronous movement of risk positions. In addition to exposure-related credit risk concentrations (bulk risks), credit risk management also considers country and sector concentrations. Segment-specific features are taken into account here.

A uniform definition based on "all-in" is used to manage bulk risk. The all-in concept comprises all customer credit lines approved by the Bank in their full amount – irrespective of the loan utilisation to date.

Management and the Supervisory Board's Risk Committee are regularly informed about the results of the analyses.

Management of economic capital commitment

Economic capital commitment is managed in order to ensure that the Commerzbank Group holds sufficient capital. To this end, in the Group Risik Strategy all risk types relevant for economic risk capital are given limits on a Group-wide basis, with, in particular, a CVaR limit being specified. Due to the systematically restricted options for reducing default risk on a short-term basis, it is important to take account of expected trends (medium-term and long-term) in order to manage credit risk. For this reason, forecast values of credit risk parameters play a key role in ongoing management. At segment and business area level, changes of forecasts are monitored and adjustments made when necessary. There is no cascaded capital limit concept for credit risk below Group level.

Country risk management

The Group's country risk calculation records both transfer risks and event risks defined by political and economic events which impact on the individual economic entities of a country. Country risks are managed on the basis of defined credit risk and transfer risk limits at country level. Country exposures which are significant for Commerzbank due to their size, are handled by the Strategic Risk Committee on a separate basis.

The regional breakdown of the exposure corresponds to the Bank's strategic direction and reflects the main areas of its global business activities.

Overview of management instruments and levels

	Risk strategies and policies	Limit and guideline systems	Portfolio monitoring and reporting	Structures of organisation and committees
Group	Overall risk strategy plus sub-risk strategies for significant risk types Establishment of a general risk understanding and creation of a uniform risk culture	Definition of Group limits (across all risk types) for capital and liquidity management Additional definition of guidelines as key points of the aspired target portfolio	Group Risk & Capital Monitor plus risk type specific Group formats (including flash reporting) Uniform, consolidated data repository as basis for Group reporting	Ensuring exchange of information and networking in committees that operate across all risk types Retaining qualified staff in line with progressive product innovation or regulatory adjustments
Sub-portfolios	Clear formulation of risk policy in guidelines (portfolios, asset classes, etc.) Differenciated credit authorities based on compliance of transactions with the Bank's risk policy	Performance metrics on level of risk categories and sub-portfolios Expansion of Group-wide performance metrics using sub-portfolio-specific indicators	Portfolio batches as per established portfolio calendar Asset quality review and analysis of High Attention Parts (HAP) Trigger monitoring with clear escalation and reporting lines	Interdisciplinary composition of segment committees Ensuring uniform economic opinions
Individual exposures	Rating-dependent and bulk-sensitive credit authority regulations with clear escalation processes	Limitation of bulk risk and uniform management according to model-independent all-in definition	Limit monitoring at individual exposure level Monthly report to the Board of Managing Directors on the development of bulk risks Review of individual customers/exposures resulting from asset quality review or HAP analyses	Deal team structures Institutionalized exchange within the risk function, also taking account of economic developments Sector-wise organization of domestic corporate business

Credit risk model

The quantification of default risks takes place through the implementation of a Group-wide credit risk model, which consists of internally developed rating systems and a loan portfolio model. The rating systems calculate the risk parameters of probability of default (PD), exposure at default (EaD[1]) and loss given default (LGD) for every credit risk position. This enables the expected loss and risk-weighted assets to be calculated for each individual position pursuant to the IRB approach.

The loan portfolio model also produces probability statements on losses from credit defaults and rating changes at portfolio level. Unexpected loss (credit value at risk – CVaR) is quantified on a risk horizon of one year. The model measures the extent of potential credit risk losses over and above the expected loss and must be backed by equity capital within the internal capital adequacy assessment process (ICAAP).

Commerzbank's loan portfolio model is an in-house model which, as with the CreditMetrics or Moody's KMV model, is based on the asset value approach. A Monte Carlo simulation simulates potential realisations of borrowers' assets and changes to borrowers' creditworthiness and defaults. Possible future losses at portfolio level are calculated and statistically analysed on this basis.

The loan portfolio model requires transaction and customer data: level of exposure, creditworthiness, expected loss given default, country and sector classification.

Dependencies between possible default events are also modelled through around 60 systematic risk factors. Specific model parameters (correlations) measure the connection of individual borrowers to these system factors and the correlation between system factors. This way they quantify potential diversification effects between different sectors and countries.

Commerzbank's credit risk model thus constitutes the basis for the calculation of risk-weighted assets according to the IRB approach and is also a key part of the internal risk and capital management process of the Group portfolio.

Rating procedures

A key component of Commerzbank's rating architecture is the use of single point of methodology rating procedures, taking advantage of a central suite of computation kernels. This uniform process architecture not only facilitates risk management and monitoring but also supports consistent rating assignments within the Commerzbank Group. The rating processes are in turn embedded in rating systems. In addition to the conventional methods of assessing creditworthiness and risk, these comprise all the processes for preparing data, calculating ratings and implementing monitoring and management measures.

The use of rating processes is an essential component of risk assessment in the Commerzbank Group, irrespective of regulatory requirements. The resulting ratings are then used in front and back office credit decision-making processes, the determination of loan loss provisions under IFRS and internal measurement of CVaR and risk-bearing capacity, respectively. Rating processes are also further revised and improved. These improvements make risk forecasts more accurate and improve management mechanisms.

The tables below show the rating processes used in the IRBA in the individual asset classes according to the CRR and their main elements as at the reporting date. Further models are in use at mBank. Details are given in the mBank disclosure report on their English internet page (About us → Capital Adequacy Information Policy).

[1] Economic EaD: Exposure at default amount taking into account a potential (partial) drawing of open lines and contingent liabilities that will adversely affect risk-bearing capacity in the event of default.

VAL-A: Material IRBA rating procedures by asset class

Exposure class	Name of the material rating procedures
Central governments or central banks	RFI-BANK, R-SCR, R-LRG
Institutions	RFI-BANK, R-LRG, NBFI
Corparates - SMEs	R-CORP/COSCO
Corporates - specialised lending	RS-CRE, IAA, RS-CFD, RS-SHP, RS-REN
Corporates - other	R-CORP/COSCO, NBFI
Retail - secured by mortgages / SMEs	R-CORP/COSCO, CORES, RS-CRE
Retail - secured by mortgages / non-SMEs	CORES
Retail - qualifying revolving	CORES
Retail - other / SMEs	R-CORP/COSCO, CORES
Retail - other / non-SMEs	CORES

VAL-B: Core components of IRBA rating procedures

Scope	Procedure	Hard facts	Soft facts	Overruling
Banks	RFI-BANK	▪	▪	▪
Countries	R-SCR	▪	▪	▪
Municipalities/federal states	R-LRG	▪		▪
Corporate customers	R-CORP/COSCO	▪	▪	▪
Financial Institutions (NBFI)	NBFI	▪	▪	▪
Private customers	CORES	▪		
Commercial real estate	RS-CRE	▪	▪	▪
Renewable energies	RS-REN	▪	▪	▪
Structured finance	RS-CFD	▪	▪	▪
Ship financing	RS-SHP	▪	▪	▪
ABS transactions (sponsors)	IAA	▪	▪	

Hard facts refer to system-based factors which are used in the rating process and allow no scope for interpretation. For instance, these may be data from companies' annual financial statements, the income of a private individual, or the age of the documents being used.

Soft facts refer to structured areas of analysis where the rating analyst needs to make an assessment and where there is therefore scope for discretion on a case-by-case basis. Examples include an assessment of management or the product quality of the customer being rated.

Overruling is a downstream area of analysis where there is a further opportunity for the analyst to assess circumstances separately based on his or her personal judgement. The system result can be adjusted upwards or downwards. The relevant reason for the decision is adequately documented. Overruling should particularly be used when there are strongly fluctuating developments (e.g. market changes) such that an adequate assessment of a company's situation based on the analysis of statistical information (e.g. annual financial statements) is not sufficient to give a future-oriented probability of default. Due to the degree of freedom this gives the rating process, overruling is subject to strict standards and regular monitoring.

The Commerzbank rating method comprises 25 rating classes for customers not in default (1.0 to 5.8) and five default classes (6.1 to 6.5). The Commerzbank master scale allocates precisely one rating class, stable over time, to each probability of default. The rating methods are validated annually and recalibrated where necessary so that they reflect the latest assessment based on all actual observed defaults. The probability of default ranges assigned to the ratings are the same for all portfolios. This ensures internal comparability consistent with the master scale method. For guidance and indicative purposes, the Commerzbank master scale also shows external ratings as well as credit quality steps in accordance with Article 136 CRR. However, a direct reconciliation is not possible, because external ratings of different portfolios show fluctuating default rates from year to year.

The credit approval authorities of both individual staff and the committees (Board of Managing Directors, credit committee, credit sub-committees) are graduated by a range of factors including size of exposure and rating class.

Commerzbank master scale

Commerzbank AG rating	PD and EL mid-point %	PD and EL range %	S&P scale		Credit quality steps in accordance with Article 136 CRR[1]	
1.0	0	0	AAA	AAA	I	Investment Grade
1.2	0.01	0 – 0.02				
1.4	0.02	0.02 – 0.03	AA+	AA		
1.6	0.04	0.03 – 0.05	AA, AA–		II	
1.8	0.07	0.05 – 0.08	A+, A	A		
2.0	0.11	0.08 – 0.13	A–			
2.2	0.17	0.13 – 0.21	BBB+	BBB	III	
2.4	0.26	0.21 – 0.31	BBB			
2.6	0.39	0.31 – 0.47				
2.8	0.57	0.47 – 0.68	BBB–			
3.0	0.81	0.68 – 0.96	BB+	BB	IV	Sub-investment grade
3.2	1.14	0.96 – 1.34	BB			
3.4	1.56	1.34 – 1.81				
3.6	2.10	1.81 – 2.40	BB–			
3.8	2.74	2.40 – 3.10				
4.0	3.50	3.10 – 3.90	B+	B	V	Non-investment grade
4.2	4.35	3.90 – 4.86	B			
4.4	5.42	4.86 – 6.04				
4.6	6.74	6.04 – 7.52				
4.8	8.39	7.52 – 9.35	B–			
5.0	10.43	9.35 – 11.64				
5.2	12.98	11.64 – 14.48	CCC+	CCC	VI	
5.4	16.15	14.48 – 18.01	CCC, CCC–			
5.6	20.09	18.01 – 22.41	CC, C	CC, C		
5.8	47.34	22.41 – 99.99				
6.1	100	> 90 days past due	D			Default
6.2		Imminent insolvency				
6.3		Restructuring with recapitalisation				
6.4		Termination without insolvency				
6.5		Insolvency				

[1] CRR = Capital Requirements Regulation (EU) No 575/2013.

As at 31 December 2018, Commerzbank has an IRBA coverage ratio at Group level of 96.9% for IRBA exposure values and 92.2% for risk-weighted IRBA exposure values, exceeding the IRBA exit threshold of 92% under section 10 of the Solvency Regulation (in the version applicable as at 1 January 2014). For loans and receivables that are not covered by the procedures approved by the supervisory authorities for the IRB approach, the standardised approach for credit risk (SACR) applies, under which flat risk weightings are to be used or risk weightings are to be based on external assessments of the borrower's creditworthiness.

Risk parameters

In addition to classifying the probability of default (PD) within the scope of the rating process, correctly assessing loss severity is essential for a reliable and holistic risk assessment. The loss severity is determined firstly by the exposure at default (EaD) and secondly by the loss given default (LGD).

In general, modelling the probabilities of default is based on the Bank's internal long-standing empirical default data. Should this data not be sufficient for specific portfolios (low-default portfolios), different approaches are used to model the probabilities of default. Shadow rating procedures are one option. Comparing the Bank's internal risk factors with the ratings of external agencies gives indications of how the Bank's credit rating estimates should be classified in relative terms. The shadow rating procedures are calibrated on the basis of empirical default rates over many years for the rating classes used by external rating agencies. In rating procedures for special funding, the customer's credit rating derives principally from the cash flows generated by the rating object. Typically, the rating procedures are therefore based on cash flow simulations using stochastic processes. The procedures are normally used in low default or low number portfolios for which only very few external benchmarks exist. The models are therefore causally produced and often calibrated using expert knowledge. Wholly expert-based rating procedures are the final option. No external target criterion is available for these procedures and there are no cash flow simulations. Parameterisation of the models and their calibration are based wholly on expert knowledge.

When forecasting EaD unused credit lines and other contingent liabilities are included via credit conversion factors (CCFs). Depending on the transaction and the customer, the CCFs describe the probability of drawdown in the event of a default within the next twelve months.

The LGD is primarily determined by the expected proceeds from collateral and unsecured portions of loans. Proceeds from collateral are modelled via recovery rates representing a discount on the previously defined market value. The recovery rate depends on the characteristics of the collateral. For instance, when modelling for properties, the collateral is differentiated by property type and location. To determine the proceeds on unsecured portions of loans, the focus is primarily on the characteristics of the customer and the transaction.

The CCF and LGD models are based on bank-internal empirical loss data. For this purpose, Commerzbank refers to a database of internal credit defaults since 1997. New defaults are recorded continuously and are made available for statistical analysis once processing is complete. For quality assurance purposes, the data collection process is monitored by a number of controls and automatic checking procedures.

Both the internal and regulatory requirements of the CRR are taken into account when developing statistical models for estimating EaD and LGD. Discussions with experts from back office and debt workout departments play an important role when identifying relevant factors and validating the results. In instances where there is only a small number of historical default or collateral utilisation cases, the empirical analyses are supplemented with expert assessments.

It is possible that a positive correlation of the risk parameters PD, LGD and CCF with one or more common macroeconomic risk factors may lead to a heightened systematic credit risk. It is for this reason that CRR Art. 181 (1) b) requires the use of LGD estimates that are appropriate even in an economic downturn (so-called downturn LGDs). Periods of an economic downturn are characterised by systemically high default rates above the long-term average. In downturn analyses, downturn years were determined and/or confirmed to estimate the risk parameters (CCF and LGD components). Statistical models, particularly regression models, are used to examine whether the downturn phases identified have a significant impact on the loss ratios; if applicable, an appropriate discount is determined.

All of the models are regularly validated and recalibrated on the basis of the new findings, if necessary. Empirically-based PD, LGD and EaD parameters are used in all important internal processes at Commerzbank. The PD, LGD and EaD models employed by Commerzbank are approved for the advanced IRB approach for the asset classes listed in CRR Art. 452(c) i) to iv). The suitability of the models was verified by the Bundesbank, BaFin and the ECB as part of the inspection prior to the granting of authorisation for the advanced IRB approach and ex post reviews.

Finally, combining the above components yields an assessment of the expected loss (EL = EaD*PD*LGD) and the risk density as a ratio of EL to EaD (EL to EaD in basis points). The internal master scale is used to clearly allocate borrower PDs (customer ratings) and loan commitment risk densities (credit ratings) to the Bank's internal rating classes.

Validation

Pursuant to Article 185 CRR, all risk classification procedures are subject to a regular validation and calibration of parameters. The credit risk control unit is the relevant unit for model development and parameter calibration. The relevant models are validated at least once a year and the results recorded in validation reports. Responsibility for this lies with the independent validation unit. Independence is ensured through different reporting lines to the senior management level. Due to the specific skill profiles of employees, validation of the IAA rating methods for conduits is currently still performed by a separate risk controlling unit with responsibility for validation (organisational change planned in 2019).

All validation results together with the need for action resulting from them are presented for approval to a validation committee in which senior management is represented. A summary of the validation committee's results as well as any irregularities and necessary changes are presented to the Bank's Strategic Risk Committee; approval is required if there are any red validation traffic lights. Regular monitoring of procedures is an additional system control element. To check the quality of the rating procedures, specialist personnel within Internal Audit regularly review the methods and processes used and inspect validation and monitoring methods. In the event of changes to the rating systems in accordance with CRR Article 143, an independent formal investigation is carried out to establish whether the relevant quantitative and qualitative criteria were taken into account during categorisation, together with the resulting categorisation.

Validation concepts are defining which analyses have to be carried out rotationally for the rating systems as well as for EaD and LGD models. The material analysis results are grouped and evaluated using a traffic-light system. If the standards and limits that have been defined in the validation concept are not met, it must be clarified if there is a need for action. In this case, concrete steps must be defined along with a timetable for implementing them. These steps may include, for instance, measures to improve data quality or a revision of the process in question.

Generally a distinction is to be made between the method validation and the process validation of the models. Data quality aspects and statistical analyses are of specific interest for the method validation. This involves comparing the model forecasts with the reality over the course of the assessment period. The quality of the forecasts is verified using mathematical/statistical methods. Assessing the discriminatory power of rating procedures may involve using Gini coefficients, concordance indices and hit rate analyses, for instance. The calibration of procedures may be checked using various statistical tests, such as the Spiegelhalter or binomial test. Validation and model development do not take into account any regulatory floors for PD. These are only taken into account during the regulatory capital calculation to determine RWA.

Depending on the type of model a different validation procedure to back-test each single model has to be applied, as described in the following:

- **Default/non-default rating procedure:** In default/non-default models, ratio selection, parameter estimates and calibration are mainly based on internal default periods. A check is therefore made during validation to ascertain whether the internally measured default rates tally with the predicted probabilities of default. Discriminatory power is also checked by calculating the AUC value, and the Gini coefficient respectively.
- **Shadow rating procedure**: The classic back-testing methods used for default/non-default models cannot normally be applied to portfolios with very few defaults. Consequently, back-testing in shadow rating procedures relies very heavily on comparisons with external ratings. Comparing the Bank's internal ratings with those of external agencies (Standard & Poor's, Moody's and FitchRatings) gives indications of how the Bank's credit rating estimates should be classified in relative terms. For this benchmarking, contingency tables, for example, are produced, deviations analysed and the Spearman correlation coefficient calculated. A benchmarking analysis is naturally only useful or possible if a large number of external ratings are available. If this is not the case, pseudo discriminatory power values, for example, can be calculated using either external or final internal ratings.
- **Hybrid models:** Hybrid models are basically mixtures of default/non–default models and shadow rating procedures. In some low-default portfolios, an internal data history has had time to develop. While this alone is not sufficient to develop a default/non-default model and corresponding validation, the available data history is yet being incorporated for validation or development purposes. The validation techniques of default/non-default models and shadow rating procedures are combined in these procedures.
- **Cash flow-based procedures**: In rating procedures for special funding, the customer's credit rating derives principally from the cash flows generated by the rating object. Typically, the rating procedures are therefore based on cash flow simulations using stochastic processes. The procedures are normally used in low default and low number respectively portfolios for which only very few external benchmarks exist. The models are therefore causally produced and often calibrated using expert

knowledge. Direct comparisons of the predicted PDs with realised default rates and discriminatory power analyses using the AUC are not normally very meaningful due to the low number of defaults. The statistical testing of EaD and LGD predictions of these models are likewise difficult. Key elements of the validation of these procedures are descriptive analyses of the input data and comparisons of the cash flows and volatilities predicted by the users with actual cash flows.

- **Wholly expert-based PD procedures**: No external target criterion is available for these procedures and there are no cash flow simulations. Calibration is based wholly on expert knowledge. Validation is therefore very heavily reliant on expert know-how, as is the development. For the validation, the results produced by the procedure in particular are compared with the expert opinion, e.g. by evaluating the overruling pattern.
- **EaD and LGD models**: On the basis of additional default and loss data full-sample and out-of-sample tests are carried out through statistical backtests. In this context the validity of existing parameter differentiations and the discriminatory power of the applied risk factors have always to be analysed. Data quality and the representativeness of observations for future loss events are also important subjects of analyses.

The following table gives an overview of the quantitative model approaches used for the individual rating procedures. The scope of application of the rating procedures is presented in the section on rating procedures in tables VAL-A and VAL-B.

VAL1: Overview on IRBA rating procedures of Commerzbank AG

	PD validation		EaD / LGD validation	
Rating procedure	Methodology	Data history Years	Methodology	Data history Years
RFI-BANK	Shadowrating, Default/non-default	5	Calibrated empirically	19
R-SCR	Shadowrating	5	Calibrated empirically	19
R-LRG	Shadowrating	11	Expert-based	–
R-CORP/COSCO	Shadowrating, Default/non-default	5	Calibrated empirically	19
NBFI	Expert-based, Shadowrating	5	Expert-based	–
CORES	Default/non-default	5	Calibrated empirically	19
RS-CRE	Default/non-default, Shadowrating	5	Calibrated empirically	11
RS-CFD	Cash flow simulation	5	Cash flow simulation	11
RS-REN	Cash flow simulation	5	Cash flow simulation	11
RS-SHP	Cash flow simulation	5	Cash flow simulation	14
ABS IAA	IAA-methods[1]	–	IAA-methods[1]	–

[1] For internal classification procedure for securities see page 77.

Process validation is carried out in collaboration with the risk model users. This includes compliance of the procedures with regulations, overruling analyses and general user acceptance. For EaD and LGD procedures the precise technical implementation of parameters in all using systems has to be verified. Asset Quality Reviews established in credit risk management also guarantee a continuously reliable data quality and the implementation of the model true to the process. Monthly reporting of rating coverage to the Board of Managing Directors ensures that the portfolios are valued using up-to-date and valid rating analyses.

The validations performed in 2018 show largely unremarkable findings. The validation results for all separately calibrated IRBA parameters and/or sub-models are summarised in the tables below and broken down by PD, LGD and EaD method. This shows the cases in which the tolerance limits set by the corresponding validation concepts were exceeded, as a result of which adjustments are recommended. In the PD range, close observation of a small score combination in R-CORP/COSCO as measured against the overall EAD is recommended. The reason for this is a minor underestimation below the critical threshold, which has not yet resulted in the recommendation of an adjustment from the validation.

Of the changes recommended from the previous validation cycle of 2017, one adjustment took effect in R-CORP/ COSCO during 2018 which mainly resulted in a more conservative assessment within the asset class "Corporates – thereof SMEs". The current validations also resulted in marked adjustments to the LGD parameters for private and corporate customers and, to a lesser extent, for ship financings and in the public finance sector. The validations of the EaD models did not reveal any significant need for adjustments.

VAL2: Validation results per calibration segment (validation based on data basis 2018)

	PD		LGD		EaD	
Validation	**Number**	**EaD in %**	**Number**	**EaD in %**	**Number**	**EaD in %**
Adequate	45	100	276	83	29	99
Too conservative - adjustment recommended	0	0	15	11	3	1
Too progressive - adjustment recommended	0	0	19	6	0	0
Total	**45**	**100**	**310**	**100**	**32**	**100**

An overview of the PD validation results as at 31 December 2017 for the relevant rating systems by IRBA asset class is provided in table EU CR9; the change mentioned above for 2018 does not as yet affect this calculation. Around 91% of the Commerzbank Group's total IRBA RWA are accounted for by the rating procedures in table VAL1. The remainder largely result from retail and corporate rating methods run independently by mBank, whose results can be found in the disclosure report of mBank on the bank's English-language homepage (at About us → Capital Adequacy Information Policy).

It is worth mentioning that the default rates of the Commerzbank Group (excluding mBank) are almost all below the intended PD bands. This is primarily due to the sustained positive economic climate in Germany, with historically low default rates in the high-default-rating methods over the past few years. The calibration method for shadow rating procedures and expert-based rating processes has also had an effect. Here the target criterion is the external rating and/or expert assessments, which in some cases substantially exceed the historical default rates in these low-default portfolios. In the case of external ratings, the rating agencies use default rates over many years. Accordingly, in all asset classes with a significant contribution from low-default rating procedures such as those found in table VAL-A, the internal classification is a conservative one.

EU CR9: IRB approach – Backtesting of PD per exposure class

a	b	c	d	e	f		g	h	i
	PD range	External rating equivalent	Weighted average PD	Atrithmetic average PD by obligors	Number of obligors		Defaulted obligors in the year	Of which new obligors	Average historical annual default rate
					End of previous year	End of the year			
			%	%					%
Central governments or central banks	0.00 to < 0.15	AAA to A-	0.00	0.06	146	120	0	0	0.00
	0.15 to < 0.25	BBB+	0.19	0.19	6	3	0	0	0.00
	0.25 to < 0.50	BBB, BBB-	0.30	0.39	13	13	0	0	0.00
	0.50 to < 0.75	BB+	0.57	0.60	4	5	0	0	0.00
	0.75 to < 2.50	BB to B+	1.03	1.39	10	9	0	0	0.00
	2.50 to 10.00	B to CCC+	5.34	5.51	19	19	1	0	3.33
	10.00 to < 100.00	CCC to C	27.01	25.90	13	11	1	0	2.26
	Subtotal		0.30	2.28	211	180	2	0	0.83
Institutions	0.00 to < 0.15	AAA to A-	0.05	0.07	497	515	0	0	0.00
	0.15 to < 0.25	BBB+	0.19	0.20	171	176	0	0	0.00
	0.25 to < 0.50	BBB, BBB-	0.39	0.36	300	276	0	0	0.00
	0.50 to < 0.75	BB+	0.59	0.60	152	117	0	0	0.25
	0.75 to < 2.50	BB to B+	1.34	1.42	381	329	1	0	0.43
	2.50 to 10.00	B to CCC+	4.97	4.54	306	277	1	0	0.62
	10.00 to < 100.00	CCC to C	20.44	35.12	49	38	2	1	1.96
	Subtotal		1.27	2.12	1,856	1,728	4	1	0.32
Corporates TOTAL	0.00 to < 0.15	AAA to A-	0.07	0.08	5,322	4,771	14	4	
	0.15 to < 0.25	BBB+	0.20	0.20	4,327	3,967	6	0	
	0.25 to < 0.50	BBB, BBB-	0.35	0.36	5,507	5,421	12	1	
	0.50 to < 0.75	BB+	0.61	0.61	2,576	2,569	20	2	
	0.75 to < 2.50	BB to B+	1.37	1.33	4,951	4,681	56	2	
	2.50 to 10.00	B to CCC+	4.69	4.71	1,754	1,571	105	12	
	10.00 to < 100.00	CCC to C	36.23	25.39	528	422	133	3	
	Subtotal		1.56	1.24	24,965	23,402	346	24	
Corporates, thereof SMEs	0.00 to < 0.15	AAA to A-	0.08	0.09	416	379	0	0	0.05
	0.15 to < 0.25	BBB+	0.19	0.20	484	442	0	0	0.17
	0.25 to < 0.50	BBB, BBB-	0.36	0.36	589	596	2	0	0.31
	0.50 to < 0.75	BB+	0.62	0.62	334	350	2	0	0.53
	0.75 to < 2.50	BB to B+	1.37	1.30	803	761	14	0	1.25
	2.50 to 10.00	B to CCC+	4.99	4.78	402	428	16	0	4.76
	10.00 to < 100.00	CCC to C	15.69	16.25	98	113	15	0	21.46
	Subtotal		1.64	1.63	3,126	3,069	49	0	1.69
Corporates, thereof specialised lending	0.00 to < 0.15	AAA to A-	0.03	0.03	636	608	7	2	0.40
	0.15 to < 0.25	BBB+	0.20	0.20	161	134	4	0	0.55
	0.25 to < 0.50	BBB, BBB-	0.36	0.36	379	355	3	0	1.05
	0.50 to < 0.75	BB+	0.60	0.61	228	201	7	0	1.53
	0.75 to < 2.50	BB to B+	1.30	1.28	291	309	2	0	1.93
	2.50 to 10.00	B to CCC+	5.42	5.19	160	133	35	4	6.56
	10.00 to < 100.00	CCC to C	42.87	40.60	230	105	89	1	19.07
	Subtotal		3.46	5.45	2,085	1,845	147	7	3.82
Corporates, thereof other	0.00 to < 0.15	AAA to A-	0.09	0.09	4,270	3,784	7	2	0.13
	0.15 to < 0.25	BBB+	0.20	0.20	3,682	3,391	2	0	0.15
	0.25 to < 0.50	BBB, BBB-	0.35	0.36	4,539	4,470	7	1	0.20
	0.50 to < 0.75	BB+	0.61	0.61	2,014	2,018	11	2	0.50
	0.75 to < 2.50	BB to B+	1.38	1.34	3,857	3,611	40	2	1.29
	2.50 to 10.00	B to CCC+	4.05	4.61	1,192	1,010	54	8	4.30
	10.00 to < 100.00	CCC to C	19.58	22.61	200	204	29	2	13.02
	Subtotal		0.92	0.95	19,754	18,488	150	17	0.93

EU CR9_Forts.: IRB approach – Backtesting of PD per exposure class

a	b	c	d	e	f		g	h	i
	PD range	External rating equivalent	Weighted average PD %	Atrithmetic average PD by obligors %	Number of obligors		Defaulted obligors in the year	Of which new obligors	Average historical annual default rate %
					End of previous year	End of the year			
Retail TOTAL	0.00 to < 0.15	AAA to A-	0.05	0.04	1,861,954	1,890,515	699	2	
	0.15 to < 0.25	BBB+	0.20	0.19	267,916	272,291	396	6	
	0.25 to < 0.50	BBB, BBB-	0.36	0.36	283,573	298,598	762	7	
	0.50 to < 0.75	BB+	0.60	0.62	133,459	139,319	651	18	
	0.75 to < 2.50	BB to B+	1.28	1.35	307,563	329,606	3,541	103	
	2.50 to 10.00	B to CCC+	4.57	5.12	130,407	137,377	6,179	295	
	10.00 to < 100.00	CCC to C	21.63	22.61	56,191	62,831	11,630	1,745	
	Subtotal		0.63	0.92	3,041,063	3,130,537	23,858	2,176	
… thereof secured by mortgages / SMEs	0.00 to < 0.15	AAA to A-	0.11	0.11	292	169	0	0	0.01
	0.15 to < 0.25	BBB+	0.20	0.20	205	233	0	0	0.12
	0.25 to < 0.50	BBB, BBB-	0.35	0.36	457	432	0	0	0.10
	0.50 to < 0.75	BB+	0.63	0.62	150	123	0	0	0.37
	0.75 to < 2.50	BB to B+	1.05	1.09	263	227	0	0	0.22
	2.50 to 10.00	B to CCC+	4.31	4.54	91	54	1	0	2.21
	10.00 to < 100.00	CCC to C	18.01	21.14	17	18	3	0	10.20
	Subtotal		0.89	0.98	1,475	1,256	4	0	0.49
… thereof secured by mortgages / non-SMEs	0.00 to < 0.15	AAA to A-	0.05	0.06	215,629	225,183	111	0	0.06
	0.15 to < 0.25	BBB+	0.20	0.19	103,687	106,633	114	1	0.11
	0.25 to < 0.50	BBB, BBB-	0.36	0.35	88,703	92,175	112	0	0.14
	0.50 to < 0.75	BB+	0.60	0.60	26,528	26,155	63	2	0.25
	0.75 to < 2.50	BB to B+	1.24	1.26	24,065	24,293	141	1	0.65
	2.50 to 10.00	B to CCC+	4.99	5.12	8,666	8,892	298	6	2.80
	10.00 to < 100.00	CCC to C	21.47	21.38	4,318	4,138	667	15	12.75
	Subtotal		0.56	0.56	471,596	487,469	1,506	25	0.41
… thereof qualifying revolving	0.00 to < 0.15	AAA to A-	0.03	0.04	1,414,911	1,441,271	468	0	0.02
	0.15 to < 0.25	BBB+	0.19	0.19	102,418	107,641	193	1	0.12
	0.25 to < 0.50	BBB, BBB-	0.36	0.36	120,646	124,216	420	2	0.24
	0.50 to < 0.75	BB+	0.62	0.62	63,607	67,933	345	6	0.37
	0.75 to < 2.50	BB to B+	1.40	1.38	147,828	166,699	1,671	23	0.80
	2.50 to 10.00	B to CCC+	4.69	4.73	65,211	71,490	3,010	54	3.13
	10.00 to < 100.00	CCC to C	23.97	22.46	17,978	19,848	3,696	233	12.18
	Subtotal		0.42	0.55	1,932,599	1,999,098	9,803	319	0.31
… thereof other / SMEs	0.00 to < 0.15	AAA to A-	0.10	0.11	8,065	4,851	12	1	0.12
	0.15 to < 0.25	BBB+	0.20	0.19	14,354	10,161	16	0	0.14
	0.25 to < 0.50	BBB, BBB-	0.37	0.37	10,998	18,741	44	0	0.26
	0.50 to < 0.75	BB+	0.62	0.62	4,451	5,751	28	0	0.43
	0.75 to < 2.50	BB to B+	1.30	1.31	12,603	13,327	181	11	0.94
	2.50 to 10.00	B to CCC+	4.85	5.48	10,735	9,393	546	87	2.84
	10.00 to < 100.00	CCC to C	18.91	16.87	2,503	2,985	414	134	8.54
	Subtotal		1.95	2.02	63,709	65,209	1,241	233	1.31
… thereof other / non-SMEs	0.00 to < 0.15	AAA to A-	0.06	0.05	223,057	219,041	108	1	0.05
	0.15 to < 0.25	BBB+	0.20	0.20	47,252	47,623	73	4	0.15
	0.25 to < 0.50	BBB, BBB-	0.36	0.36	62,769	63,034	186	5	0.26
	0.50 to < 0.75	BB+	0.60	0.63	38,723	39,357	215	10	0.44
	0.75 to < 2.50	BB to B+	1.32	1.34	122,804	125,060	1,548	68	1.02
	2.50 to 10.00	B to CCC+	3.85	5.65	45,704	47,548	2,324	148	3.84
	10.00 to < 100.00	CCC to C	24.44	23.32	31,375	35,842	6,850	1,363	12.72
	Subtotal		0.89	2.32	571,684	577,505	11,304	1,599	1.28

Credit risk mitigation

At Commerzbank, risks are mitigated via a range of measures including collateral and netting.

The collateral mainly takes the form of mortgages, financial collateral, guarantees, indemnity letters, credit derivatives, life insurances, other registered liens and other real collateral. Within the scope of the IRBA assessments, this collateral was recognised by the regulator as eligible collateral.

In the IRBA, the Bank takes account of credit risk mitigating effects arising from the receipt of eligible guarantees (guarantees/sureties, comparable claims on third parties) by using the risk parameters (PD and LGD) of the guarantor. Under the SACR, the Bank uses the risk weightings laid down by the supervisory authority.

Regulatory setting-off provided, as part of the assessment of their declaration of liability, guarantors are subject to a review of their creditworthiness and rating in accordance with their sector and business. The aim of the creditworthiness check is to establish the guarantor's creditworthiness and maximum solvency.

An overview of the main types of guarantors and credit derivatives' counterparties, broken down by rating classes, is given in the following two tables:

CRM1: Guarantors and credit derivatives' counterparties by main type and rating classes (IRBA))

IRBA | Exposure | €m	Rating 1 (0.00-0.08%)	Rating 2 (0.08-0.68%)	Rating 3 (0.68-3.10%)	Rating 4 (3.10-9.35%)	Rating 5 (9.35-99.99%)	Rating 6 (100%)	Total
Public sector, defence and social security	532	1,663	0	0	0	0	2,195
Banks and financial institutions	3,787	600	11	1	1	0	4,399
Insurance companies	1,179	1,319	1	0	0	0	2,500
Industries	45	1,185	607	17	11	0	1,865
Other service companies	10	945	121	25	5	0	1,105
Private households	24	18	1	0	0	0	42
Others	1	0	6	1	0	0	7
Total IRBA 2018	**5,577**	**5,730**	**746**	**43**	**16**	**0**	**12,113**

CRM2: Guarantors and credit derivatives' counterparties by main type and rating classes (SACR)

SACR | Exposure | €m	AAA	AA	A	BBB	BB	n.a.	Total
Public sector, defence and social security	2,081	415	0	0	0	0	2,495
Banks and financial institutions	247	1	4	17	0	0	269
Insurance companies	2,776	150	2	0	0	0	2,928
Private households	0	0	0	0	0	0	0
Others	4	0	0	0	0	0	4
Total SACR 2018	**5,108**	**566**	**5**	**17**	**0**	**0**	**5,696**

In accordance with the CRR, the quality of the collateral recognised by the regulator is subject to rigorous review and is continuously monitored. In particular, this includes establishing the legal enforceability of the collateral and ensuring that it is valued regularly. Depending on the collateral type, this takes place at adequate intervals, at least annually or as circumstances require. Positive correlations between the creditworthiness of the borrower and the value of the collateral or guarantee are established in the collateral processing and lending process and collateral instruments affected are not offset. Collateral for corporate customers is processed exclusively by the risk function's collateral management unit.

The Bank carries out collateral concentration analyses for all lending collateral (physical and personal collateral). Various aspects such as collateral category, borrower's rating class and regional allocation of the collateral are examined. With reference to these aspects, the Board of Managing Directors is kept informed on a regular basis of the development of the collateral pool and possible anomalies/concentrations. As at 31 December 2018, more than three-quarters of the collateral values of collateralised claims not in default were accounted for by customers with an investment grade rating. Measured in terms of the collateral value, most collateral was held in countries with an investment grade rating. Table EU CR3 at the end of the section provides an overview of the scope of use of credit risk mitigation techniques by asset class. Most of the positions in column c are secured by mortgage liens.

The valuation and processing of collateral are governed by universally applicable standards and collateral-specific instructions (guidelines, descriptions of processes, IT instructions). Collateral agreements are legally validated; as far as possible, standard contracts and samples are used. The standards established to hedge against or mitigate the risks of loans, which also take account of the regulatory requirements of CRR, include, amongst others:

- Legal and operational standards for documentation and data collection as well as valuation standards.
- The standardisation and updating of collateral valuations are ensured by laying down valuation processes, prescribing standardised valuation methods, parameters and defined discounts for collateral, clearly defining responsibilities for the processing and valuation process, and stipulating requirements for revaluations at regular intervals.
- Other standards for taking account of specific risks, e.g. operational risks, correlation and concentration risks, market price change risks (e.g. due to currency fluctuations), country risks, legal risks or risks of changes in the law, and risks of insufficient insurance cover.

For the vast majority of its default risk positions from counterparty credit risk, Commerzbank Group uses the internal model method (IMM) according to Article 283 CRR. The credit equivalent amounts are determined as expected future exposure through the simulation of various market scenarios, taking netting and collateral into account.

Also for securities repurchase, lending and comparable transactions involving securities or goods, the exposures are determined in accordance with Article 283 and Article 273 (2) CRR on the basis of an internal model method. Guarantees and credit derivatives are taken into account via the substitution approach. The double-default procedure defined under Article 153 (3) CRR is applied.

Details on the use of credit risk mitigation techniques in default risks from counterparty credit risk are set out in the section on counterparty credit risk.

EU CR3: Credit risk mitigation (CRM) techniques – overview

		a	b	c	d	e
	€m	Exposures unsecured – Carrying amount	Exposures secured – Carrying amount	Exposures secured by collateral	Exposures secured by financial guarantees	Exposures secured by credit derivatives
1	Central governments or central banks	27,750	616	18	570	0
2	Institutions	36,203	6,781	974	4,124	0
3	Corporates	168,669	39,480	13,536	11,965	228
4	thereof SMEs	8,255	6,400	2,607	372	0
5	thereof specialised lending	14,497	5,905	4,430	87	0
6	thereof other	145,917	27,174	6,499	11,506	228
7	Retail	47,807	85,701	60,524	172	0
8	thereof secured by mortgages / SMEs	56	956	738	6	0
9	thereof secured by mortgages / non-SMEs	3,049	73,005	52,700	2	0
10	thereof qualifying revolving	13,374	0	0	0	0
11	thereof other / SME	10,921	2,374	866	123	0
12	thereof other / non-SMEs	20,407	9,365	6,220	41	0
13	Equity exposures IRB	0	0	0	0	0
14	Other non-credit obligation assets	12,926	0	0	0	0
15	**Total IRB approach**	**293,356**	**132,578**	**75,052**	**16,831**	**228**
16	Central governments or central banks	42,415	0	0	0	0
17	Regional governments or local authorities	16,189	2	1	2	0
18	Public sector entities	4,414	192	6	83	0
19	Multilateral development banks	820	0	0	0	0
20	International organisations	377	0	0	0	0
21	Institutions	2,647	218	218	0	0
22	Corporates	7,494	955	295	185	0
23	thereof SMEs	682	111	7	33	0
24	Retail	8,209	391	187	12	0
25	thereof SMEs	44	12	9	0	0
26	Secured by mortgages on immovable property	0	2,181	2,181	0	0
27	thereof SMEs	0	4	4	0	0
28	Exposures in default	100	46	4	15	0
29	Items associated with particularly high risk	137	0	0	0	0
30	Covered bonds	13	0	0	0	0
31	Claims on institutions and corporates with a short-term credit assessment	17	0	0	0	0
32	Collective investment undertakings	2,212	0	0	0	0
33	Equity exposures	973	0	0	0	0
34	Other exposures	2,809	0	0	0	0
35	**Total SACR**	**88,825**	**3,985**	**2,891**	**296**	**0**
36	**Total**	**382,182**	**136,563**	**77,942**	**17,127**	**228**
37	of which loans	188,959	121,028	73,384	12,822	77
38	of which debt securities	32,206	507	0	501	0
39	of which defaulted positions	1,347	915	715	127	0

Credit risk and credit risk mitigation in the IRBA

The credit risk of the Commerzbank Group's IRBA portfolio divided into the relevant IRBA asset classes and PD ranges is shown below. The information in table EU CR6 on on-balance-sheet gross receivables refers to the risk exposure values to be determined according to Article 166 CRR. These represent the expected amounts of the IRBA positions that will be exposed to a risk of loss. The off-balance-sheet claims are shown before taking into account credit risk adjustments and conversion factors. Exposure at default (regulatory EaD) shows the exposure values after taking into account credit risk mitigation. The risk parameters CCF, PD and LGD are calculated as EaD-weighted averages. The IRBA default definition is also used for internal purposes.

The companies in the Commerzbank Group use the IRBA approach. They may therefore use internal estimates of credit conversion factors (CCFs) for regulatory purposes, too. CCFs are necessary for off-balance-sheet transactions in order to assess the likely exposure in the event of a possible default on commitments that have not yet been drawn.

Tables EU CR6 and EU CR7 show only portfolios which fall within the scope of IRBA and are rated with a rating process that has been approved by the supervisory authority. Positions in the risk exposure class other non-loan-related assets are not listed in table EU CR6. These assets amounting to €2.7bn do not have any creditworthiness risks and are therefore not relevant for the management of default risks. Table EU CR6 also does not include mBank S.A. positions of €1.8bn which are subject to the IRBA slotting approach in accordance with Article 153 (5) CRR and are shown in table EU CR10. Investment positions with a fixed risk weighting according to Article 155 (2) CRR are not relevant in the Commerzbank Group as at 31 December 2018 and are therefore not part of table EU CR10. Appendix 5 contains an overview of the exposure-weighted averages of the credit risk parameters PD and LGD by asset class and relevant geographical location (countries in which Commerzbank has been authorised or has a branch or a subsidiary) according to Article 452 (j) i) CRR.

The securitisation exposures in the IRBA are presented separately in the section on securitisations in this report. Counterparty default risks are shown in the section on default risks from counterparty credit risks in this report.

The risk exposure values shown in this section generally differ from the EaD values in the Annual Report (economic EaD) due to the following:

- As required by EBA guideline EBA/GL/2016/11 on disclosure requirements, credit risk and counterparty credit risk are presented separately in the Disclosure Report.
- Some transactions are not included in risk-weighted assets (RWA) for regulatory purposes but are included in the EaD of the Annual Report and Risk Report respectively.
- The figures shown in this Disclosure Report refer to the regulatory scope of consolidation. By contrast, the figures in the Annual Report refer to the IFRS scope of consolidation.

The amount of the exposures secured by collateral, financial guarantees or credit derivatives and the amount of unsecured exposures by asset class is shown in table EU CR3 in the preceding section on credit risk mitigation. In addition to the collateral in the standardised approach to credit risk (hereinafter referred to as SACR), under the IRBA some physical and other collateral which is only eligible for recognition under the IRBA is also offset.

The calculation of collateral is based on market values weighted with recovery rates. These recovery rates are based on empirical data and form part of the LGD models. By definition, the rates cannot exceed 100%; therefore, the collateral values are normally lower than the market values. By contrast, under the IRBA the substitution approach is used to offset guarantees and credit derivatives. The protection therefore does not take effect in the LGD, as is the case with financial and other IRBA collateral, but via the substitution of the debtor's risk parameters with those of the guarantor. Alternatively, the double-default procedure may be used in the IRBA.

The impact of credit derivatives used as credit risk mitigation techniques on the amount of RWA of credit risk in the IRBA portfolio at 31 December 2018 comes to less than 0.5% (see the next table EU CR7).

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

		a	b	c	d	e	f	g	h	i	j	k	l
	PD scale	Original on-balance-sheet gross exposure	Off-balance-sheet exposures pre-CCF	Average CCF	EaD post CRM and post CCF	Average PD	Number of obligors	Average LGD	Average maturity years[1]	RWAs	RWA density	EL	Value adjustments and provisions
		€m	€m	%	€m	%		%		€m	%	€m	€m
Central governments or central banks	0.00 to < 0.15	8,060	674	0.42	11,022	0.04	404	28.53	2.3	1,206	11	1	
	0.15 to < 0.25	17,107	16	0.47	17,412	0.19	18	20.29	1.1	2,474	14	7	
	0.25 to < 0.50	659	142	0.52	924	0.32	19	56.27	2.6	669	72	2	
	0.50 to < 0.75	609	34	0.45	623	0.59	13	70.90	3.5	832	133	3	
	0.75 to < 2.50	250	67	0.45	91	1.15	23	95.18	1.4	166	183	1	
	2.50 to 10.00	249	155	0.42	212	6.36	56	87.21	1.3	652	307	12	
	10.00 to < 100.00	199	108	0.31	47	21.64	45	46.29	2.0	99	211	3	
	100.00 (default)	28	11	0.20	0	100.00	3	31.02	1.0	0	16	0	
	Subtotal	**27,162**	**1,209**	**0.42**	**30,332**	**0.22**	**556**	**26.15**	**1.6**	**6,099**	**20**	**29**	**4.0**
Institutions	0.00 to < 0.15	12,153	2,319	0.45	15,743	0.06	1,606	31.40	2.7	2,713	17	3	
	0.15 to < 0.25	2,341	1,164	0.45	2,437	0.19	186	38.71	2.0	967	40	2	
	0.25 to < 0.50	7,500	1,549	0.44	7,690	0.35	292	43.17	2.2	5,254	68	12	
	0.50 to < 0.75	4,458	676	0.46	4,656	0.59	120	35.73	1.8	2,925	63	10	
	0.75 to < 2.50	5,366	1,632	0.45	5,112	1.22	334	40.25	1.0	4,289	84	25	
	2.50 to 10.00	1,725	1,617	0.46	1,418	4.33	273	32.47	1.0	1,346	95	19	
	10.00 to < 100.00	288	328	0.46	243	21.32	38	15.38	2.3	221	91	6	
	100.00 (default)	12	0	0.20	12	100.00	15	82.84	1.0	0	3	10	
	Subtotal	**33,842**	**9,285**	**0.45**	**37,311**	**0.68**	**2,804**	**36.01**	**2.1**	**17,715**	**47**	**86**	**144.1**
Corporates TOTAL	0.00 to < 0.15	16,385	33,659	0.40	30,938	0.05	15,084	39.56	2.4	8,016	26	10	
	0.15 to < 0.25	13,601	31,349	0.36	25,456	0.20	12,708	36.29	2.4	10,199	40	20	
	0.25 to < 0.50	21,809	30,845	0.41	34,320	0.35	18,042	36.32	2.4	19,418	57	48	
	0.50 to < 0.75	9,661	10,421	0.39	13,226	0.60	9,741	37.08	2.2	8,573	65	31	
	0.75 to < 2.50	15,476	13,144	0.37	16,771	1.23	22,662	36.86	2.0	13,685	82	83	
	2.50 to 10.00	4,088	2,354	0.39	4,471	4.31	8,919	34.74	1.6	5,048	113	75	
	10.00 to < 100.00	1,574	658	0.35	1,761	19.35	2,232	15.16	1.9	1,815	103	149	
	100.00 (default)	2,355	249	0.29	2,382	100.00	3,915	46.23	1.3	926	39	1,348	
	Subtotal	**84,950**	**122,678**	**0.42**	**129,324**	**2.99**	**30,718**	**39.91**	**2.5**	**67,680**	**52**	**1,764**	**1,571.3**
Corporates, thereof SMEs	0.00 to < 0.15	1,047	1,658	0.40	1,689	0.08	538	40.94	2.5	358	21	1	
	0.15 to < 0.25	923	719	0.36	1,114	0.20	521	40.10	2.5	376	34	1	
	0.25 to < 0.50	1,696	1,210	0.41	2,161	0.35	896	38.54	2.4	962	45	3	
	0.50 to < 0.75	934	629	0.41	1,151	0.60	687	40.17	2.2	650	56	3	
	0.75 to < 2.50	2,344	1,262	0.42	2,774	1.36	2,045	42.19	2.2	2,193	79	16	
	2.50 to 10.00	1,236	489	0.41	1,390	4.31	1,013	42.18	1.9	1,507	108	25	
	10.00 to < 100.00	253	63	0.36	254	19.35	180	42.39	1.9	430	169	20	
	100.00 (default)	376	49	0.39	384	100.00	233	67.85	1.4	189	49	250	
	Subtotal	**8,809**	**6,078**	**0.40**	**10,916**	**5.03**	**6,109**	**41.76**	**2.3**	**6,665**	**61**	**319**	**232.3**

[1] For retail, this parameter is not included in the RWA calculation, therefore – according to EBA/GL/2016/11 – no details are given here for retail.

EU CR6_cont.: IRB approach – Credit risk exposures by exposure class and PD range

		a	b	c	d	e	f	g	h	i	j	k	l
	PD scale	Original on-balance-sheet gross exposure €m	Off-balance-sheet exposures pre-CCF €m	Average CCF %	EaD post CRM and post CCF €m	Average PD %	Number of obligors	Average LGD %	Average maturity years[1]	RWAs €m	RWA density %	EL €m	Value adjustments and provisions €m
Corporates, thereof specialised lending	0.00 to < 0.15	5,215	571	0.47	5,482	0.05	613	39.56	4.4	1,374	25	1	
	0.15 to < 0.25	1,244	188	0.55	1,345	0.21	135	36.29	4.1	569	42	1	
	0.25 to < 0.50	2,838	584	0.51	3,110	0.35	355	36.32	3.8	1,648	53	4	
	0.50 to < 0.75	1,152	233	0.57	1,275	0.61	204	47.53	3.8	1,107	87	4	
	0.75 to < 2.50	2,886	362	0.57	3,048	1.38	312	36.86	3.9	2,650	87	15	
	2.50 to 10.00	734	305	0.44	867	4.63	138	34.74	3.5	969	112	12	
	10.00 to < 100.00	950	466	0.44	1,153	55.19	110	15.16	2.6	690	60	84	
	100.00 (default)	1,012	27	0.33	1,021	100.00	301	46.23	1.7	399	39	440	
	Subtotal	**16,032**	**2,734**	**0.50**	**17,302**	**10.20**	**2,119**	**37.36**	**3.8**	**9,406**	**54**	**561**	**456.2**
Corporates, thereof other	0.00 to < 0.15	10,123	31,431	0.42	23,766	0.09	3,891	40.70	2.4	6,284	26	9	
	0.15 to < 0.25	11,434	30,443	0.42	22,998	0.20	3,582	40.04	2.4	9,254	40	18	
	0.25 to < 0.50	17,274	29,051	0.42	29,048	0.35	4,781	40.71	2.5	16,808	58	42	
	0.50 to < 0.75	7,575	9,559	0.39	10,800	0.61	2,360	37.08	2.3	6,816	63	24	
	0.75 to < 2.50	10,247	11,520	0.37	10,950	1.23	5,202	38.50	2.0	8,842	81	52	
	2.50 to 10.00	2,118	1,560	0.39	2,215	4.43	1,826	37.71	1.6	2,572	116	37	
	10.00 to < 100.00	371	130	0.35	353	31.71	455	38.26	2.2	696	197	45	
	100.00 (default)	967	172	0.29	976	100.00	778	71.15	1.3	338	35	657	
	Subtotal	**60,109**	**113,866**	**0.41**	**101,106**	**1.54**	**22,581**	**40.15**	**2.3**	**51,609**	**51**	**884**	**882.7**
Retail	0.00 to < 0.15	42,060	16,973	0.46	55,407	0.04	9,308,400	15.70		1,730	3	8	
	0.15 to < 0.25	16,080	3,764	0.50	18,729	0.19	2,034,825	15.50		1,633	9	8	
	0.25 to < 0.50	20,156	5,675	0.53	24,235	0.35	2,279,930	15.94		3,501	14	22	
	0.50 to < 0.75	7,213	2,363	0.52	9,057	0.60	1,154,930	16.65		2,073	23	16	
	0.75 to < 2.50	9,891	2,918	0.51	11,921	1.20	3,373,715	16.76		4,153	35	49	
	2.50 to 10.00	3,924	616	0.52	4,309	4.46	1,462,040	16.73		2,472	57	70	
	10.00 to < 100.00	1,450	89	0.48	1,492	19.84	583,860	18.09		1,409	94	106	
	100.00 (default)	1,088	34	0.00	1,082	100.00	417,380	40.95		804	74	582	
	Subtotal	**101,861**	**32,431**	**0.75**	**126,232**	**1.57**	**4,112,198**	**26.83**		**17,773**	**14**	**861**	**783.4**
Total	0.00 to < 0.15	78,659	53,626	0.40	113,110	0.04	2,041,469	15.70	2.3	13,665	12	22	
	0.15 to < 0.25	49,129	36,294	0.36	64,035	0.19	439,085	15.50	1.1	15,273	24	36	
	0.25 to < 0.50	50,124	38,212	0.41	67,168	0.32	495,772	15.94	2.2	28,842	43	84	
	0.50 to < 0.75	21,942	13,494	0.39	27,562	0.59	246,688	16.65	1.8	14,402	52	59	
	0.75 to < 2.50	30,984	17,762	0.37	33,895	1.15	699,817	16.76	1.0	22,292	66	159	
	2.50 to 10.00	9,986	4,741	0.39	10,410	4.31	303,047	16.73	1.0	9,518	91	176	
	10.00 to < 100.00	3,510	1,182	0.31	3,543	19.35	121,856	15.16	1.9	3,544	100	265	
	100.00 (default)	3,482	293	0.00	3,475	100.00	87,227	31.02	1.0	1,730	50	1,940	
	Total (all portfolios)	**247,815**	**165,603**	**0.48**	**323,199**	**1.91**	**4,144,579**	**33.06**	**1.4**	**109,267**	**34**	**2,741**	**2,502.8**

[1] For retail, this parameter is not included in the RWA calculation, therefore – according to EBA/GL/2016/11 – no details are given here for retail.

EU CR6_Retail: IRB approach – Retail's Credit risk exposures by exposure class and PD range

		a	b	c	d	e	f	g	h	i	j	k	l
	PD scale	Original on-balance-sheet gross exposure €m	Off-balance-sheet exposures pre-CCF €m	Average CCF %	EaD post CRM and post CCF €m	Average PD %	Number of obligors	Average LGD %	Average maturity years[1]	RWAs €m	RWA density %	EL €m	Value adjustments and provisions €m
Retail	0.00 to < 0.15	42,060	16,973	0.46	55,407	0.04	9,308,400	15.70		1,730	3	8	
	0.15 to < 0.25	16,080	3,764	0.50	18,729	0.19	2,034,825	15.50		1,633	9	8	
	0.25 to < 0.50	20,156	5,675	0.53	24,235	0.35	2,279,930	15.94		3,501	14	22	
	0.50 to < 0.75	7,213	2,363	0.52	9,057	0.60	1,154,930	16.65		2,073	23	16	
	0.75 to < 2.50	9,891	2,918	0.51	11,921	1.20	3,373,715	16.76		4,153	35	49	
	2.50 to 10.00	3,924	616	0.52	4,309	4.46	1,462,040	16.73		2,472	57	70	
	10.00 to < 100.00	1,450	89	0.48	1,492	19.84	583,860	18.09		1,409	94	106	
	100.00 (default)	1,088	34	0.00	1,082	100.00	417,380	40.95		804	74	582	
	Gesamt	**101,861**	**32,431**	**0.75**	**126,232**	**1.57**	**4,112,198**	**26.83**		**17,773**	**14**	**861**	**783.4**
...secured by mortgages / SMEs	0.00 to < 0.15	79	3	0.91	81	0.10	228	30.57		5	6	0	
	0.15 to < 0.25	141	4	0.81	141	0.21	671	26.87		13	9	0	
	0.25 to < 0.50	302	16	0.97	316	0.36	1,905	29.96		47	15	0	
	0.50 to < 0.75	135	15	1.13	152	0.62	1,064	28.87		32	21	0	
	0.75 to < 2.50	198	15	1.33	218	1.20	1,326	31.90		78	36	1	
	2.50 to 10.00	57	2	1.28	60	4.46	398	32.83		47	79	1	
	10.00 to < 100.00	31	0	0.85	31	19.84	250	30.15		41	130	2	
	100.00 (default)	36	0	0.00	35	100.00	263	54.40		34	95	19	
	Subtotal	**979**	**55**	**1.11**	**1,034**	**4.78**	**6,104**	**30.85**		**296**	**29**	**23**	**22.4**
...secured by mortgages / non-SMEs	0.00 to < 0.15	34,884	1,070	0.96	35,914	0.06	275,404	15.70		923	3	3	
	0.15 to < 0.25	13,083	354	0.97	13,427	0.20	122,152	15.50		875	7	4	
	0.25 to < 0.50	14,825	527	0.98	15,343	0.35	105,539	15.94		1,577	10	9	
	0.50 to < 0.75	4,503	241	0.99	4,741	0.60	29,479	16.65		740	16	5	
	0.75 to < 2.50	4,198	182	0.98	4,377	1.25	27,630	16.76		1,110	25	9	
	2.50 to 10.00	1,390	24	0.98	1,413	4.93	11,108	16.73		797	56	12	
	10.00 to < 100.00	595	5	0.98	600	21.45	5,641	18.09		608	101	23	
	100.00 (default)	367	0	0.61	368	100.00	3,869	40.95		377	103	126	
	Subtotal	**73,845**	**2,404**	**0.97**	**76,182**	**0.99**	**580,550**	**15.99**		**7,007**	**9**	**191**	**195.1**
...qualifying revolving	0.00 to < 0.15	233	10,693	0.77	8,447	0.04	1,452,476	59.46		151	2	2	
	0.15 to < 0.25	54	505	0.77	442	0.19	108,300	58.64		28	6	0	
	0.25 to < 0.50	105	513	0.77	498	0.36	124,977	58.58		53	11	1	
	0.50 to < 0.75	74	232	0.76	250	0.62	68,322	58.89		41	16	1	
	0.75 to < 2.50	241	436	0.76	572	1.39	208,485	59.09		173	30	5	
	2.50 to 10.00	134	123	0.76	228	4.55	71,735	59.52		160	70	6	
	10.00 to < 100.00	38	13	0.76	47	21.52	19,932	59.43		72	151	6	
	100.00 (default)	12	0	0.74	12	100.00	4,132	61.48		2	19	7	
	Subtotal	**892**	**12,513**	**0.77**	**10,497**	**0.46**	**2,058,359**	**59.35**		**681**	**6**	**29**	**31.0**

[1] For retail, this parameter is not included in the RWA calculation, therefore – according to EBA/GL/2016/11 – no details are given here for retail.

EU CR6_Retail_cont.: IRB approach – Retail's Credit risk exposures by exposure class and PD range

		a	b	c	d	e	f	g	h	i	j	k	l
	PD scale	**Original on-balance-sheet gross exposure** €m	**Off-balance-sheet exposures pre-CCF** €m	**Average CCF** %	**EaD post CRM and post CCF** €m	**Average PD** %	**Number of obligors**	**Average LGD** %	**Average maturity years[1]**	**RWAs** €m	**RWA density** %	**EL** €m	**Value adjustments and provisions** €m
…other / SME	0.00 to < 0.15	246	1,062	0.46	743	0.10	7,512	43.93		66	9	0	
	0.15 to < 0.25	461	1,609	0.50	1,256	0.20	22,208	44.68		185	15	1	
	0.25 to < 0.50	997	2,084	0.53	2,081	0.37	45,618	44.55		447	21	3	
	0.50 to < 0.75	736	805	0.52	1,148	0.62	26,098	40.71		311	27	3	
	0.75 to < 2.50	2,083	1,225	0.51	2,679	1.26	67,371	41.07		983	37	14	
	2.50 to 10.00	1,101	320	0.52	1,245	4.96	38,937	41.71		634	51	26	
	10.00 to < 100.00	411	54	0.48	428	20.22	18,306	38.88		293	69	34	
	100.00 (default)	316	27	0.38	316	100.00	14,842	70.85		142	45	217	
	Subtotal	**6,352**	**7,186**	**0.51**	**9,897**	**5.22**	**240,878**	**43.37**		**3,061**	**31**	**298**	**242.3**
…other / non-SME	0.00 to < 0.15	6,618	4,144	0.86	10,222	0.06	298,797	32.19		585	6	2	
	0.15 to < 0.25	2,341	1,293	0.87	3,464	0.20	181,312	35.91		532	15	2	
	0.25 to < 0.50	3,926	2,536	0.81	5,998	0.35	211,390	43.10		1,377	23	8	
	0.50 to < 0.75	1,764	1,070	0.94	2,766	0.61	118,341	41.30		949	34	7	
	0.75 to < 2.50	3,171	1,060	0.86	4,074	1.32	387,089	40.12		1,808	44	21	
	2.50 to 10.00	1,241	146	0.87	1,362	4.59	177,563	40.04		833	61	25	
	10.00 to < 100.00	375	17	0.77	386	24.29	76,899	44.61		395	102	42	
	100.00 (default)	356	6	0.38	350	100.00	62,791	64.80		249	71	213	
	Subtotal	**19,792**	**10,273**	**0.86**	**28,622**	**2.14**	**1,508,732**	**37.87**		**6,728**	**24**	**321**	**292.6**

[1] For retail, this parameter is not included in the RWA calculation, therefore – according to EBA/GL/2016/11 – no details are given here for retail.

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

		a	b
	€m	**Pre-credit derivatives RWAs**	**Actual RWAs**
1	**Exposures under FIRB**	**0**	**0**
2	Central governments or central banks	0	0
3	Institutions	0	0
4	Corporates - SMEs	0	0
5	Corporates - specialised lending	0	0
6	Corporates - other	0	0
7	**Exposures under AIRB**	**113,529**	**113,385**
8	Central governments or central banks	6,099	6,099
9	Institutions	17,661	17,716
	Corporates	69,269	69,069
10	thereof SMEs	6,665	6,665
11	thereof specialised lending	10,795	10,795
12	thereof other	51,808	51,609
	Retail	17,773	17,773
13	thereof secured by mortgages / SMEs	296	296
14	thereof secured by mortgages / non-SMEs	7,007	7,007
15	thereof qualifying revolving	681	681
16	thereof other / SME	3,061	3,061
17	thereof other / non-SMEs	6,728	6,728
18	Equity IRB	0	0
19	Other non-credit obligation assets	2,728	2,728
20	**Total**	**113,529**	**113,385**

EU CR10: IRB (specialised lending)

		a	b	c	d	e	f
€m	**Specialised lending**						
Regulatory categories	**Remaining maturity**	**On-balance-sheet amount**	**Off-balance-sheet amount**	**Risk weight**	**Exposure amount**	**RWAs**	**Expected loss**
Category 1	Less than 2.5 years	241	154	50%	396	197	1
	Equal to or more than 2.5 years	39	19	70%	39	27	0
Category 2	Less than 2.5 years	0	0	70%	0	0	0
	Equal to or more than 2.5 years	1,200	313	90%	1,203	1,079	10
Category 3	Less than 2.5 years	7	1	115%	8	9	0
	Equal to or more than 2.5 years	47	0	115%	48	54	1
Category 4	Less than 2.5 years	0	0	250%	0	0	0
	Equal to or more than 2.5 years	9	0	250%	9	23	1
Category 5	Less than 2.5 years	25	0	-	55	0	27
	Equal to or more than 2.5 years	37	0	-	60	0	30
Total	**Less than 2.5 years**	**273**	**155**		**458**	**206**	**29**
	Equal to or more than 2.5 years	**1,332**	**332**		**1,359**	**1,183**	**42**

Table EU CR8 below shows changes in the RWA of the credit risk in the IRBA portfolio of Commerzbank Group between 30 September 2018 and 31 December 2018. The increase in RWA in the fourth quarter of 2018 was mainly attributable to further growth in the operating segments (“Asset size”). The increase in RWA from the “Model updates” category was mostly due to the recalibration of risk parameters. However, a further improvement in the portfolio quality (“Asset quality”, “Collateral effects”) and “Duration effects” (RWA reduction due to the regular expiry of residual terms) led to an RWA reduction in the period under review.

EU CR8: RWA flow statements of credit risk exposures under the IRB approach

		a	b
	€m	**Risk weighted assets (RWAs)**	**Capital requirements**
1	**RWA at previous quarter end**	**111,225**	**8,898**
2	Asset size	2,878	230
3	Asset quality	–573	–46
4	Model updates	2,150	172
5	Methodology and policy	0	0
6	Acquisitions and disposals	0	0
7	Foreign exchange movements	175	14
8	Collateral effects	–1,128	–90
9	Duration effects	–1,160	–93
10	Others	–183	–15
11	**RWA at the end of the reporting period**	**113,385**	**9,071**

Credit risk and credit risk mitigation in the SACR

The portfolios currently excluded from the IRBA are measured in accordance with SACR regulations as permitted under partial use provisions. In contrast to the IRBA, the SACR is largely based on a flat risk weighting or external ratings. Commerzbank has nominated the rating agencies Standard & Poor’s Rating Services, Moody’s Investors Service and FitchRatings for the use of external ratings.

Where an external credit rating is available for a position, that external rating is used to determine the risk weighting. Commerzbank uses the standard mapping of external credit assessments to the relevant credit quality steps published by the EBA in accordance with Article 136 CRR. Where two or more external credit ratings are available for one position, the risk weighting is assigned in accordance with the provisions of Article 138 CRR.

For unrated positions, if the conditions set out in Articles 139 and 140 CRR are met, a risk weighting is calculated on the basis of a derived credit rating. In all other cases, the position is treated as an unrated exposure.

External ratings are used for central governments or central banks, regional and local governments, public-sector entities, multilateral development banks, institutions, companies and covered bonds. They are not used for positions in local currency in order to derive risk weightings for foreign currency exposures.

Table EU CR4 below shows the impact of the credit risk mitigation techniques used in the SACR portfolio in accordance with Chapter 4 of Title II of Part Three CRR and the conversion factors used in accordance with Article 111 CRR. For the reported SACR exposure value, unlike the IRBA, the valuation allowances based on each of the positions are deducted. Table EU CR5 shows the distribution of exposure values after credit risk mitigation and conversion factors associated with each credit quality step and asset class in accordance with Article 444 (e) CRR..

EU CR4: Standardised approach – Credit risk exposure and CRM effects

		a	b	c	d	e	f
	Exposure classes	**Exposures before CCF and CRM**		**Exposures post CCF and CRM**		**RWAs and RWA density**	
	€m	**On-balance-sheet amount**	**Off-balance-sheet amount**	**On-balance-sheet amount**	**Off-balance-sheet amount**	**RWAs**	**RWA density %**
1	Central governments or central banks	42,365	50	46,532	280	395	0.8
2	Regional government or local authorities	15,406	786	16,028	20	1,150	7.2
3	Public sector entities	4,259	346	4,408	127	317	7.0
4	Multilateral development banks	820	0	831	0	0	0.0
5	International organisations	377	0	377	0	0	0.0
6	Institutions	2,864	1	2,671	3	514	19.2
7	Corporates	5,855	2,594	5,427	1,660	6,240	88.0
8	Retail	4,494	4,106	4,304	179	3,372	75.2
9	Secured by mortgages on immovable property	2,170	11	2,170	5	782	36.0
10	Exposures in default	142	4	125	0	159	126.7
11	Exposures associated with particularly high risk	137	0	137	0	205	150.0
12	Covered bonds	13	0	13	0	1	10.0
13	Institutions and corporates with a short-term credit assessment	17	0	17	0	3	20.0
14	Collective investment undertakings	2,212	0	2,212	0	726	32.8
15	Equity	973	0	973	0	1,352	139.1
16	Other items	2,745	64	2,745	64	6,359	226.4
17	**Total**	**84,848**	**7,963**	**88,970**	**2,339**	**21,576**	**23.6**

EU CR5: Standardised approach – Credit risk (post CCF and CRM) by exposure class and risk weight

	Exposure classes	Risk weight																Total	Of which unrated
	€m	0%	2%	4%	10%	20%	35%	50%	70%	75%	100%	150%	250%	370%	1250%	Others	Deducted		
1	Central governments or central banks	46,186	0	125	0	10	0	197	0	0	293	0	0	0	0	0	0	46,812	40,146
2	Regional government or local authorities	11,365	0	0	0	4,027	0	623	0	0	33	0	0	0	0	0	0	16,048	14,652
3	Public sector entities	2,980	0	0	0	1,540	0	11	0	0	4	0	0	0	0	0	0	4,535	3,897
4	Multilateral development banks	831	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	831	252
5	International organisations	377	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	377	377
6	Institutions	266	29	0	0	2,263	0	109	0	0	7	0	0	0	0	0	0	2,674	2,492
7	Corporates	0	0	0	0	341	1	1,213	0	0	5,421	102	0	0	0	0	0	7,077	6,133
8	Retail	0	0	0	0	0	0	0	0	4,434	47	2	0	0	0	0	0	4,484	4,484
9	Secured by mortgages on immovable property	0	0	0	0	0	2,055	117	0	0	0	3	0	0	0	0	0	2,176	2,176
10	Exposures in default	0	0	0	0	0	0	0	0	0	58	67	0	0	0	0	0	125	125
11	Exposures associated with particularly high risk	0	0	0	0	0	0	0	0	0	0	137	0	0	0	0	0	137	137
12	Covered bonds	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	23	13
13	Institutions and corporates with a short-term credit assessment	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	17	0
14	Collective investment undertakings	1,037	0	0	0	0	0	0	0	0	89	0	0	0	0	1,086	0	2,212	2,212
15	Equity	0	0	0	0	0	0	0	0	0	719	0	253	0	0	0	0	973	973
16	Other items	0	0	0	0	0	0	0	0	0	442	0	2,367	0	0	0	0	2,809	2,809
17	**Total**	**63,042**	**29**	**125**	**23**	**8,199**	**2,056**	**2,270**	**0**	**4,434**	**7,113**	**311**	**2,620**	**0**	**0**	**1,086**	**0**	**91,309**	**80,878**

In order to mitigate credit risk in the SACR, the Commerzbank Group takes financial collateral and guarantees into consideration. These are dealt with separately in the section on risk mitigation. Furthermore, collateral in the form of property charges also reduces the risk weighting.

Under the SACR, guarantees are treated according to the substitution principle. This means that the borrower's risk weighting is replaced by that of the guarantor. Consequently, the guaranteed amount is transferred from the borrower's exposure class to that of the guarantor. This is why the exposure before CRM for assets guaranteed by central governments and central banks, for example, is less than after CRM. This can be seen in table EU CR4. However, a transfer only takes place if the risk weighting of the guarantor is lower than that of the borrower.

Past due positions are shown with a risk weighting of 150%. Depending on the impairments based on these positions in accordance with IFRS 9 or the collateral, a risk weighting of 100% can be applied or they may be shifted to another exposure class.

The amount of the exposures secured by collateral, financial guarantees or credit derivatives and the amount of unsecured exposures by asset class is shown in table EU CR3 in the section on credit risk mitigation. The effectively secured risk position values, i.e. taking into consideration all of the relevant haircuts for the collateral, are allocated to the SACR exposure class. In taking financial collateral into account as a credit risk mitigation technique, Commerzbank generally uses the comprehensive method as defined under Articles 223 to 228 CRR. In doing so, the risk exposure value for the default risk position is reduced by the value of the financial collateral.

Overarching portfolio analyses

This section provides an overview of the total portfolio containing default risks from credit risk with a net exposure value of €519bn as at 31 December 2018.

We show the total of SACR and IRBA positions with their net exposure value as defined by the EBA guideline EBA\GL\2016\11 (77) to (83).

In accordance with Chapter 6 of Title II of Part III CRR, instruments with counterparty default risk are not included in this section. They are reported separately in the section on default risks from counterparty credit risk.

Effectively securitised positions are also not included in the tables below. In accordance with Articles 243 and 244 CRR, positions are deemed to be effectively securitised if there has been an effective and operative transfer of risk. This applies regardless of whether these are traditionally or synthetically securitised positions. Securitisation positions arising from Group companies included in this Disclosure Report acting as investors or sponsors are also not included. Due to their particular significance, these are shown in the separate chapter on securitisations.

Table EU CRB-B provides an overview of net exposure values by asset class on the reporting date, average net exposure values during the period under review and the percentage share of exposures in each asset class in the Commerzbank Group's total exposure.

The country clusters selected in table EU CRB-C match the classification by geographical area used for internal purposes. For the presentation of exposures the following materiality threshold was used to identify material geographical regions or countries: all countries where net exposure share is at least 1% of total exposure are reported separately within their region, all other countries within that region are summarised under "Others". All regions where net exposure is at least 1% of the total exposure are reported as a separate region. All other regions are combined in the "Other regions" column. Alongside further additional information, Appendix 4 includes a list of countries which are not considered to be material within a region (share of total exposure <1%).

The breakdown by sector in table EU CRB-D is based on the methodology applied by the Federal Statistical Office and a system used internally.

Table EU CRB-E shows the net exposure values by contractual residual terms. Overnight receivables include net debit balances on current accounts, call and overnight transactions and credit lines that can be terminated at any time.

EU CRB-B: Total and average net amount of exposure

		a	b	
	€m	**Net value of exposures as at 31 December 2018**	**Average net exposures over the entire year 2018**	**Share as at 31.12.2018** %
1	Central governments or central banks	28,367	25,656	5.5
2	Institutions	42,984	43,968	8.3
3	Corporates	208,149	205,679	40.1
5	thereof SMEs	14,655	12,064	2.8
4	thereof specialised lending	20,402	21,113	3.9
	thereof other	173,092	172,502	33.4
6	Retail	133,509	130,605	25.7
8	thereof secured by mortgages / SMEs	1,012	1,032	0.2
9	thereof secured by mortgages / non-SMEs	76,054	74,398	14.7
10	thereof qualifying revolving	13,374	13,291	2.6
12	thereof other / SME	13,296	13,119	2.6
13	thereof other / non-SMEs	29,773	28,764	5.7
14	Equity exposures IRB	0	0	0.0
	Other non-credit obligation assets	12,926	11,844	2.5
15	**Total IRB approach**	**425,934**	**417,751**	**82.1**
16	Central governments or central banks	42,415	46,909	8.2
17	Regional governments or local authorities	16,192	17,637	3.1
18	Public sector entities	4,606	4,574	0.9
19	Multilateral development banks	820	704	0.2
20	International organisations	377	350	0.1
21	Institutions	2,865	3,063	0.6
22	Corporates	8,449	8,144	1.6
23	thereof SMEs	794	404	0.2
24	Retail	8,600	8,571	1.7
25	thereof SMEs	56	50	0.0
26	Secured by mortgages on immovable property	2,181	2,168	0.4
27	thereof SMEs	4	9	0.0
28	Exposures in default	146	195	0.0
29	Items associated with particularly high risk	137	108	0.0
30	Covered bonds	13	15	0.0
31	Claims on institutions and corporates with a short-term credit assessment	17	16	0.0
32	Collective investment undertakings	2,212	2,405	0.4
33	Equity exposures	973	930	0.2
34	Other exposures	2,809	2,766	0.5
35	**Total SACR**	**92,811**	**98,554**	**17.9**
36	**Total**	**518,745**	**516,305**	**100.0**

EU CRB-C: Geographical breakdown of exposures by exposure class

		Net exposure value								
	Exposure class	**Western Europe**	**thereof...**							
	€m		**Germany**	**Switzerland**	**Great Britain**	**Italy**	**France**	**Netherlands**	**Spain**	**Others**
1	Central governments or central banks	2,193	323	410	0	385	0	0	0	1,075
2	Institutions	17,841	4,486	1,709	1,749	1,611	1,716	496	904	5,170
3	Corporates	163,661	105,228	8,103	12,385	2,440	9,899	5,852	3,852	15,902
3a	thereof SMEs	10,536	9,436	115	6	3	271	139	440	126
3b	thereof specialised lending	17,451	12,007	222	1,903	153	442	485	163	2,074
3c	thereof other	135,674	83,785	7,765	10,477	2,284	9,185	5,228	3,249	13,701
4	Retail	120,399	119,193	499	157	29	80	82	32	326
4a	thereof secured by mortgages / SMEs	481	475	0	0	0	0	3	0	3
4b	thereof secured by mortgages / non-SMEs	69,902	69,263	291	78	15	41	47	16	151
4c	thereof qualifying revolving	13,286	13,179	26	13	5	13	8	7	34
4d	thereof other / SME	10,705	10,621	14	8	2	2	7	3	47
4e	thereof other / non-SMEs	26,025	25,654	168	58	7	23	17	7	91
5	Equity exposures IRB	0	0	0	0	0	0	0	0	0
	Other non-credit obligation assets	11,794	11,789	1	4	0	0	0	0	0
6	**Total IRB approach**	**315,887**	**241,018**	**10,721**	**14,295**	**4,465**	**11,694**	**6,431**	**4,788**	**22,473**
7	Central governments or central banks	33,308	21,409	0	1,029	8,697	0	20	509	1,643
8	Regional governments or local authorities	13,976	10,128	0	2,478	362	0	0	828	179
9	Public sector entities	4,549	3,865	0	0	0	627	0	0	56
10	Multilateral development banks	579	0	0	0	0	0	0	0	579
11	International organisations	0	0	0	0	0	0	0	0	0
12	Institutions	2,145	1,698	0	342	0	2	0	36	67
13	Corporates	4,650	2,562	30	1,739	0	2	61	0	256
14	Retail	7,860	7,777	49	6	1	3	2	2	20
15	Secured by mortgages on immovable property	163	162	0	0	0	0	0	0	0
16	Exposures in default	56	38	0	0	17	1	0	0	0
17	Items associated with particularly high risk	92	72	0	15	0	4	0	0	0
18	Covered bonds	13	4	0	0	0	0	2	0	7
19	Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	0	0	0
20	Collective investment undertakings	2,212	1,968	0	0	0	50	0	0	195
21	Equity exposures	742	728	5	1	0	4	0	0	4
22	Other exposures	2,413	2,377	0	34	0	0	0	0	2
23	**Total SACR**	**72,756**	**52,789**	**84**	**5,645**	**9,076**	**693**	**85**	**1,375**	**3,006**
24	**Total**	**388,643**	**293,808**	**10,806**	**19,940**	**13,542**	**12,388**	**6,516**	**6,164**	**25,480**

EU CRB-C_cont.: Geographical breakdown of exposures by exposure class

	Net exposure value						
	Exposure class	**Eastern Europe**	**thereof...**		**North America**	**thereof...**	
	€m		**Poland**	**Others**		**USA**	**Others**
1	Central governments or central banks	743	214	529	4,953	3,875	1,077
2	Institutions	1,921	284	1,637	3,836	2,512	1,323
3	Corporates	16,398	11,433	4,966	18,829	17,202	1,627
3a	thereof SMEs	3,765	3,630	135	9	9	0
3b	thereof specialised lending	2,279	2,091	188	437	406	32
3c	thereof other	10,354	5,712	4,643	18,383	16,788	1,596
4	Retail	12,448	12,319	129	173	159	14
4a	thereof secured by mortgages / SMEs	528	528	0	3	0	3
4b	thereof secured by mortgages / non-SMEs	5,849	5,809	40	93	89	4
4c	thereof qualifying revolving	16	2	14	21	18	3
4d	thereof other / SME	2,544	2,496	48	14	12	1
4e	thereof other / non-SMEs	3,512	3,485	27	42	40	3
5	Equity exposures IRB	0	0	0	0	0	0
	Other non-credit obligation assets	1,120	1,120	0	4	4	0
6	**Total IRB approach**	**32,630**	**25,370**	**7,260**	**27,795**	**23,753**	**4,042**
7	Central governments or central banks	9,062	7,823	1,239	0	0	0
8	Regional governments or local authorities	133	133	0	1,944	1,437	506
9	Public sector entities	30	30	0	18	0	18
10	Multilateral development banks	0	0	0	0	0	0
11	International organisations	0	0	0	0	0	0
12	Institutions	81	40	41	4	3	2
13	Corporates	2,889	2,879	9	598	587	12
14	Retail	720	184	536	5	5	1
15	Secured by mortgages on immovable property	2,018	1,326	692	0	0	0
16	Exposures in default	82	69	13	8	8	0
17	Items associated with particularly high risk	0	0	0	22	22	0
18	Covered bonds	0	0	0	0	0	0
19	Claims on institutions and corporates with a short-term credit assessment	0	0	0	17	17	0
20	Collective investment undertakings	0	0	0	0	0	0
21	Equity exposures	92	64	28	110	110	0
22	Other exposures	250	250	0	0	0	0
23	**Total SACR**	**15,357**	**12,798**	**2,559**	**2,728**	**2,190**	**538**
24	**Total**	**47,987**	**38,168**	**9,819**	**30,523**	**25,943**	**4,580**

EU CRB-C_cont.: Geographical breakdown of exposures by exposure class

		Net exposure value						
	Exposure class	**Asia**	**thereof...**			**Latin America**	**Other regions**	**Total**
	€m		**China**	**Japan**	**Others**	**(incl. Mexiko)**		
1	Central governments or central banks	19,059	404	17,075	1,580	292	1,127	28,367
2	Institutions	12,483	4,125	167	8,190	4,253	2,651	42,984
3	Corporates	6,971	2,769	432	3,769	1,646	641	208,147
3a	thereof SMEs	109	41	0	67	1	235	14,655
3b	thereof specialised lending	71	11	0	60	120	42	20,400
3c	thereof other	6,791	2,717	432	3,642	1,524	364	173,092
4	Retail	369	93	8	267	57	64	133,509
4a	thereof secured by mortgages / SMEs	0	0	0	0	0	0	1,012
4b	thereof secured by mortgages / non-SMEs	161	45	4	112	27	23	76,054
4c	thereof qualifying revolving	26	4	3	19	14	12	13,374
4d	thereof other / SME	33	12	0	20	0	1	13,296
4e	thereof other / non-SMEs	149	32	1	115	16	29	29,773
5	Equity exposures IRB	0	0	0	0	0	0	0
	Other non-credit obligation assets	0	0	0	0	0	8	12,926
6	**Total IRB approach**	**38,881**	**7,391**	**17,683**	**13,807**	**6,247**	**4,492**	**425,932**
7	Central governments or central banks	0	0	0	0	45	0	42,415
8	Regional governments or local authorities	139	0	139	0	1	0	16,192
9	Public sector entities	0	0	0	0	9	0	4,606
10	Multilateral development banks	0	0	0	0	0	241	820
11	International organisations	0	0	0	0	0	377	377
12	Institutions	0	0	0	0	18	617	2,865
13	Corporates	1	0	0	1	260	50	8,449
14	Retail	10	3	0	6	2	2	8,600
15	Secured by mortgages on immovable property	0	0	0	0	0	0	2,181
16	Exposures in default	0	0	0	0	0	0	146
17	Items associated with particularly high risk	4	0	0	4	18	0	137
18	Covered bonds	0	0	0	0	0	0	13
19	Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	17
20	Collective investment undertakings	0	0	0	0	0	0	2,212
21	Equity exposures	21	0	1	20	0	7	973
22	Other exposures	0	0	0	0	6	140	2,809
23	**Total SACR**	**175**	**3**	**140**	**31**	**359**	**1,436**	**92,811**
24	**Total**	**39,056**	**7,394**	**17,823**	**13,838**	**6,606**	**5,929**	**518,743**

EU CRB-D: Concentration of exposures by industry

	€m	Production and manufacturing industry	Energy and water supply	Wholesale and retail trade; repairs	Transport and telecommu-nication	Other services	Banks	Other financial industry and insurances	Real estate activities	Public administration and defence, compulsory social security	Private households	Others	Total
1	Central governments or central banks	0	66	0	1	99	22,212	49	33	5,895	13	0	28,367
2	Institutions	0	981	1	100	91	35,245	1,319	863	4,352	32	0	42,984
3	Corporates	94,109	18,630	24,408	15,669	10,830	42	16,143	21,718	1	5,386	1,213	208,149
3a	thereof SMEs	6,883	287	2,610	561	736	0	1,207	2,074	0	126	170	14,655
3b	thereof specialised lending	2,808	5,052	496	861	1,390	2	2,020	7,644	0	31	100	20,402
3c	thereof other	84,418	13,290	21,302	14,247	8,705	40	12,916	12,000	1	5,230	943	173,092
4	Retail	7,544	93	5,081	1,134	7,437	2	1,433	8,616	0	101,655	514	133,509
4a	thereof secured by mortgages / SMEs	23	0	16	3	40	0	9	390	0	529	2	1,012
4b	thereof secured by mortgages / non-SMEs	1,649	12	1,168	243	3,701	0	787	4,025	0	64,275	195	76,054
4c	thereof qualifying revolving	0	0	0	0	0	0	0	0	0	13,374	0	13,374
4d	thereof other / SME	4,714	72	2,912	688	1,135	2	206	1,930	0	1,455	181	13,296
4e	thereof other / non-SMEs	1,157	10	985	200	2,560	0	431	2,271	0	22,023	135	29,773
5	Equity exposures IRB	0	0	0	0	0	0	0	0	0	0	0	0
	Other non-credit obligation assets	310	0	0	1	11,331	0	7	1	105	1,172	0	12,926
6	**Total IRB approach**	**101,963**	**19,771**	**29,490**	**16,905**	**29,787**	**57,502**	**18,949**	**31,230**	**10,352**	**108,258**	**1,727**	**425,934**
7	Central governments or central banks	0	0	0	0	0	3,634	0	0	38,620	161	0	42,415
8	Regional governments or local authorities	0	0	0	0	12	0	0	0	16,158	9	13	16,192
9	Public sector entities	9	120	11	604	700	2,662	0	103	389	0	8	4,606
10	Multilateral development banks	0	0	0	0	0	579	241	0	0	0	0	820
11	International organisations	0	0	0	0	0	0	0	0	377	0	0	377
12	Institutions	5	0	0	0	56	2,754	44	0	7	0	0	2,865
13	Corporates	1,017	189	297	395	2,134	135	2,751	562	355	547	68	8,449
14	Retail	71	10	37	13	190	0	27	104	0	8,139	8	8,600
15	Secured by mortgages on immovable property	9	0	19	4	43	0	23	25	0	2,054	5	2,181
16	Exposures in default	19	16	1	1	7	16	37	12	0	38	0	146
17	Items associated with particularly high risk	0	0	0	0	0	0	48	88	0	0	0	137
18	Covered bonds	0	0	0	0	0	13	0	0	0	0	0	13
19	Claims on institutions and corporates with a short-term credit assessment	0	0	0	0	0	0	11	0	0	6	0	17
20	Collective investment undertakings	0	0	0	0	0	626	1,586	0	0	0	0	2,212
21	Equity exposures	167	0	0	98	5	0	367	205	0	128	2	973
22	Other exposures	4	0	0	0	0	71	14	34	2,367	318	0	2,809
23	**Total SACR**	**1,300**	**335**	**366**	**1,115**	**3,146**	**10,490**	**5,148**	**1,133**	**58,273**	**11,401**	**104**	**92,811**
24	**Total**	**103,263**	**20,106**	**29,856**	**18,019**	**32,933**	**67,992**	**24,098**	**32,363**	**68,625**	**119,659**	**1,831**	**518,745**

EU CRB-E: Maturity of exposures by exposure classes

		a	b	c	d	e	f
		Net exposure value					
	€m	On demand	≤ 1 year	> 1 year ≤ 5 years	> 5 years	No stated maturity	Total
1	Central governments or central banks	21,424	2,376	2,637	1,930	0	28,367
2	Institutions	7,993	16,693	9,556	8,741	0	42,984
3	Corporates	56,830	43,619	76,489	31,210	0	208,149
4	Retail	28,574	6,550	12,516	85,869	0	133,509
5	Equity exposures IRB	0	0	0	0	0	0
	Other non-credit obligation assets	12,736	0	190	0	0	12,926
6	**Total IRB approach**	**127,557**	**69,239**	**101,388**	**127,750**	**0**	**425,934**
7	Central governments or central banks	23,310	3,145	6,042	9,918	0	42,415
8	Regional governments or local authorities	791	1,322	3,847	10,232	0	16,192
9	Public sector entities	109	1,121	1,849	1,527	0	4,606
10	Multilateral development banks	0	0	255	565	0	820
11	International organisations	0	150	105	122	0	377
12	Institutions	2,326	367	94	78	0	2,865
13	Corporates	3,696	673	1,135	2,945	0	8,449
14	Retail	4,599	155	1,596	2,249	0	8,600
15	Secured by mortgages on immovable property	1,324	6	57	794	0	2,181
16	Exposures in default	90	4	17	34	0	146
17	Items associated with particularly high risk	137	0	0	0	0	137
18	Covered bonds	0	0	6	6	0	13
19	Claims on institutions and corporates with a short-term credit assessment	17	0	0	0	0	17
20	Collective investment undertakings	0	0	0	2,212	0	2,212
21	Equity exposures	805	0	167	0	0	973
22	Other exposures	433	2	8	2,367	0	2,809
23	**Total SACR**	**37,639**	**6,944**	**15,179**	**33,049**	**0**	**92,811**
24	**Total**	**165,196**	**76,183**	**116,567**	**160,799**	**0**	**518,745**

Loan loss provisions for default risks

Responsibility for processing non-performing loans lies with Group Intensive Care. These division brings together the specific expert knowledge needed to support customers undergoing restructuring and to successfully process terminated commitments including collateral realisation.

IFRS 9 stipulates that impairments for credit risks from loans and securities that are not recognised at fair value through profit or loss must be recognised using a 3-stage model based on expected credit losses. In the Commerzbank Group, the following financial instruments are included in the scope of this impairment model:

- financial assets in the form of loans and advances as well as securitised debt instruments measured at amortised cost;
- financial assets in the form of loans and advances as well as securitised debt instruments measured at fair value through other comprehensive income (FVOCI);
- lease receivables;
- irrevocable lending commitments which under IFRS 9 are not measured at fair value through profit or loss;
- financial guarantees within the scope of IFRS 9 that are not measured at fair value through profit or loss.

The Group determines the impairment using a 3-stage model based on the following requirements:

- In stage 1, as a rule all financial instruments are recognised if their risk of a loan loss (hereinafter default risk) has not risen significantly since their initial recognition. In addition, stage 1 includes all transactions with limited default risk as at the reporting date for which Commerz¬bank utilises the option provided for in IFRS 9 to refrain from making an assessment about a significant increase in the default risk. A limited default risk exists for all financial instruments with an investment-grade internal credit rating on the financial reporting date (corresponds to a Commerz¬bank rating of 2.8 or better, see master scale in section Rating procedures). An impairment must be recognised for financial instruments in stage 1 in the amount of the expected credit loss over the next 12 months (12-month ECL).
- Stage 2 includes those financial instruments with default risk that has risen significantly since their initial recognition and which, as at the financial reporting date, cannot be classified as transactions with limited default risk. Impairments in stage 2 are recognised in the amount of the financial instrument's lifetime expected credit loss (LECL).
- Financial instruments that are classified as defaulted as at the reporting date are allocated to stage 3. Commerzbank's criterion for this classification is the definition of a default in accordance with Art. 178 of the Capital Requirements Regulation (CRR). The following events are decisive in determining the default of a customer:

  – Imminent insolvency (over 90 days past due).
  – The Bank is assisting in the financial rescue/restructuring measures of the customer with or without restructuring contribution(s).
  – The Bank has demanded immediate repayment of its claims.
  – The customer is in insolvency proceedings.

The LECL is likewise used as the value of the required impairment for stage-3 financial instruments in default. When determining the LECL, the Group distinguishes in principle between significant and insignificant transactions. The amount of the LECL for insignificant transactions (volumes up to €5m[1]) is determined based on statistical risk parameters. The LECL for significant transactions (volumes greater than €5m) is the expected value of the losses derived from individual expert assessments of future cash flows based on several potential scenarios and their probability of occurrence. The scenarios and probabilities are based on assessments by recovery and resolution specialists. For each scenario – whether it is a continuation or sale scenario – the timing and amount of the expected future cash flows are estimated.

Both the customer-specific and the macroeconomic situation are taken into account (for example currency restrictions, currency value fluctuations, commodity price developments), as well as the sector environment, with a view to the future. The estimate is also based on external information. Sources include indices (e.g. World Corruption Index), forecasts (e.g. by the IMF), information from global associations of financial service providers (e.g. the Institute of International Finance) and publications from rating agencies and auditing firms.

If there is no longer a default criterion, the financial instrument recovers and is no longer allocated to Stage 3. After recovery, a new assessment is made based on the updated rating information to see if the default risk has increased significantly since initial recognition in the balance sheet, and the instrument is allocated to Stage 1 or Stage 2 accordingly.

Financial instruments which when initially recognised are already considered impaired as per the aforementioned definition (purchased or originated credit-impaired, or POCI) are handled outside the 3-stage impairment model and are therefore not allocated to any of the three stages. The initial recognition is based on fair value without recording an impairment, using an effective interest rate that is adjusted for creditworthiness. The impairment recognised in subsequent periods equals the cumulative change in the LECL since the initial recognition in the balance sheet. The LECL remains the basis for the measurement, even if the value of the financial instrument has risen.

Receivables are written off in the balance sheet as soon as they become uncollectible. Firstly, uncollectibility may arise in the settlement process based on various objective criteria. These can be, for example, the demise of the borrower without realisable assets of the estate, or completed insolvency proceedings without further prospect of payments. Secondly, loans are generally regarded as (partially) uncollectible at the latest by 720 days after their due date, and are (partially) written down to the recoverable amount within the framework of existing loan loss provisions. Such a (partial) write-down has no direct impact on ongoing debt collection measures.

[1] Für Commerzbank Z.r.t. the threshold amout was adjusted as at 30 September 2017 to an equivalent value of €1m.

Calculation of the expected credit loss in accordance with IFRS 9

Commerzbank calculates the LECL as the probability-weighted, unbiased and discounted expected value of future loan losses over the total residual maturity of the respective financial instrument, i.e. the maximum contractual term (including any renewal options) during which Commerzbank is exposed to credit risk. The 12-month ECL used for the recognition of impairments in stage 1 is the portion of the LECL that results from default events which are expected to occur within twelve months following the end of the reporting period.

The ECL for stage 1 and stage 2 as well as for insignificant financial instruments in stage 3 is determined on an individual transaction basis taking into account statistical risk parameters. These parameters have been derived from the Basel IRB approach and modified to meet the requirements of IFRS 9. The significant main parameters used in this determination include the:

- customer-specific probability of default (PD);
- loss given default (LGD); and the
- exposure at default (EaD).

The Group derives the PD by applying an internal ratings procedure, which is based on the respective customer group. The determination includes a wide variety of qualitative and quantitative variables, which are taken into account or weighted based on the respective procedure. The allocation of the PD ranges to the internal rating categories and the reconciliation to external ratings can be found in the master scale contained in the section rating procedures in this report.

The LGD is the forecasted loss given default as a percentage of the exposure at default (EaD), taking into account collateral and the capital recovery potential on the unsecured portion. The Group's estimates, which are made specifically for different types of collateral and customer groups, are determined using both observed historical portfolio data and diverse external information, such as indices and data regarding the development of purchasing power.

The EaD is the expected loan utilisation as at the default date, taking into account a (partial) drawing of open lines.

All risk parameters used from the Bank's internal models have been adjusted to meet the specific requirements of IFRS 9, and the forecast horizon has been extended accordingly to cover the entire term of the financial instruments. For example, the forecast for the development of the exposure over the entire term of the financial instrument therefore also includes, in particular, contractual and statutory termination rights.

In the case of loan products that consist of a utilised loan amount and an open credit line and for which in customary commercial practice the credit risk is not limited to the contractual notice period (in Commerzbank this relates primarily to revolving products without a contractually agreed repayment structure, such as overdrafts and credit card facilities), the LECL must be determined using a behavioural maturity, which typically exceeds the maximum contractual period. In order to ensure that the LECL for these products is determined in an empirically sound manner in compliance with IFRS 9 requirements, Commerzbank calculates the LECL directly for these products based on realised historical losses.

As a rule, the Group estimates the risk parameters specific to IFRS 9 based not only on historical default information but also, in particular, on the current economic environment (point-in-time perspective) and forward-looking information. This assessment primarily involves reviewing the effects which the Bank's macroeconomic forecasts will have regarding the amount of the ECL, and including these effects in the determination of the ECL.
A baseline scenario is used for this purpose which relies on the respective applicable consensus (forecasts of different banks on significant macroeconomic factors, such as GDP growth and the unemployment rate). This baseline scenario is then supplemented with additional macroeconomic parameters that are relevant for the model. The transformation of the macroeconomic baseline scenario into the effects on the risk parameters is based on statistically derived models. If needed, these models are supplemented with expert-based assumptions, the collection of which is regulated by a policy set by a panel. Potential effects from non-linear correlations between different macroeconomic scenarios and the ECL are corrected using a separately determined adjustment factor.

When calculating the expected credit loss, additional effects may also have to be taken into account such as those resulting from scenarios or events that are not reflected in the IFRS 9 ECL parameter set presented as part of the modelling (these may relate to singular events such as substantial political decisions or military conflicts); for these a separately determined adjustment to the result from the IFRS 9 ECL model is made. The examination as to whether such top level adjustments with the involvement of senior management are necessary, as well as their possible implementation, are regulated in a policy.

Determination of the ECL is documented in comprehensive specialist and technical guidelines.

All parameters used when determining the ECL are regularly validated by an independent unit (usually once a year). If needed, they are adjusted accordingly. The relevant policies are reviewed on an ad hoc basis.

Assessment of a significant increase in default risk

Commerzbank's rating systems combine into the PD all available quantitative and qualitative information relevant for forecasting the default risk. This metric is based primarily on a statistical selection and weighting of all available indicators. In addition, the PD adjusted in accordance with IFRS 9 requirements takes into account not only historical information and the current economic environment, but also, in particular, forward-looking information such as the forecast for the development of macroeconomic conditions.

As a consequence, Commerzbank uses the PD only as a frame of reference for assessing whether the default risk of a financial instrument has risen significantly since the date of its initial recognition. By anchoring the review of the relative transfer criterion in the robust processes and procedures of the Bank's Group-wide credit-risk-management framework (in particular, early identification of credit risk, controlling of overdrafts and the re-rating process), the Bank ensures that a significant increase in the default risk is identified in a reliable and timely manner based on objective criteria. For further information on Commerzbank's processes and procedures as well as governance in credit risk management, please refer to the explanatory information in the chapter "Credit risk" in this report.

The review to determine whether the default risk as at the financial reporting date has risen significantly since the initial recognition of the respective financial instrument is performed as at the end of the reporting period. This review compares the observed probability of default over the residual maturity of the financial instrument (lifetime PD) against the lifetime PD over the same period as expected on the date of initial recognition. In accordance with IFRS requirements, in some sub-portfolios, the original and current PD are compared based on the probability of default over a period of 12 months after the end of the reporting period (12-month PD). In these cases, the Bank uses equivalence analyses to demonstrate that no material variances have occurred compared with an assessment using the lifetime PD.

Thresholds are set using a statistical procedure in order to determine whether an increase in the PD compared with the initial recognition date is "significant". These thresholds, which are differentiated by rating models, represent a critical degree of variance compared with the average development of the PD. In order to ensure an economically sound assignment of the stage, transaction-specific factors are taken into account, including the extent of the PD at the initial recognition date, the term to date and the remaining term of the transaction.

Financial instruments are retransferred from stage 2 to stage 1 if at the end of the reporting period the default risk is no longer significantly elevated compared with the initial recognition date.

The tables on loan loss provisions below show the gross carrying values of all risk positions in default and not in default in the IFRS categories AC and FVOCI, including the associated stock of credit risk adjustments, the credit risk adjustment charges in the second half of 2018 and the relevant write-offs in the financial year 2018.

The gross carrying values for risk positions not in default also include loans that are past due by at least one day up to 90 days but are not defined as in default by virtue of the minimum threshold (2.5% of the limit or €100).

Commerzbank's criterion for the definition of defaulted (impaired) claims is the definition of a default in accordance with Artikel 178 CRR. Pursuant to section 315a.1 of the German Commercial Code, Commerzbank Group issues consolidated financial statements based on International Financial Reporting Standards (IFRS). Credit risk mitigation techniques applicable to mitigate risks for the purpose of determining the capital requirement are not relevant for the determination of the claim amount in terms of accounting. The information is structured by risk exposure class (table EU CR1-A), industry (table EU CR1-B) and geography (table EU CR1-C). The following definitions are used:

- Pursuant to the criteria of the EBA (most recently confirmed in EBA/OP/2017/02), specific credit risk adjustments include the following positions:
  - The sum of Lifetime Expected Credit Loss (LECL) for significant claims in default, determined on the basis of individual cash flow estimates, taking into account various possible scenarios (loan loss provision stage 3 on-balance and off-balance, significant).
  - LECL for non-significant exposures in default, transaction-based determined on the basis of statistical risk parameters (stage 3 on balance and off balance, non-significant)
  - LECL for on- and off-balance exposures not in default showing a significant increase in credit risk as according to IFRS9 (stage 2 on- and off-balance) and ECL for on- and off-balance exposures not in default and not showing a significant increase in credit risk as according to IFRS9 (stage 1 on- and off-balance).
- There are no general credit risk adjustments pursuant to the EBA's definition mentioned above.
- The column accumulated write-offs is the balance of write-ups and write-downs during the financial year 2018.

The country clusters selected in table EU CR1-C match the classification by geographical area used for table EU CRB-C in section Overarching portfolio analyses of this report.

The gross carrying value of the defaulted risk positions is at €3.9bn as at 31 December 2018. Further information on this is given in the Annual Report 2018 in the chapter "Default risk". In addition to the loan loss provisions presented in the tables, the gross carrying values are also offset by collateral, which is taken into account accordingly in the calculation of the expected credit loss (specific credit risk adjustments).

The breakdown by gross carrying values reflects the Commerzbank Group's focus on Germany and selected markets throughout Europe. This means that the vast majority of the expected credit loss and the loan loss provisions, respectively, are attributable to borrowers based in these regions.

Deviating from tables EU CR1-A, EU CR1-B and EU CR1-C, the tables EU CR1-D and EU CR1-E also include positions of the IFRS category FVPL. The decrease in the line Loans and advances in table EU CR1-E to €326.5bn (June 2018: €348.5bn) mainly results from a seasonal decline in the collateralised money market business in terms of reversed repos and cash collaterals.

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

		a	b	c	d	e	f	g
	€m	Gross carrying values of defaulted exposures	non-defaulted exposures	Specific credit risk adjustment	General credit risk adjustment	Accumulated write-offs	Credit risk adjustment charges of the period	Net values (a+b-c-d)
1	Central governments or central banks	39	28,332	4	0	0	–4	28,367
2	Institutions	6	43,116	138	0	10	1	42,984
3	Corporates	2,369	207,046	1,265	0	263	91	208,149
4	thereof SMEs	400	14,462	207	0	56	34	14,655
5	thereof specialised lending	993	19,749	340	0	22	30	20,402
	thereof other	975	172,835	719	0	185	27	173,092
6	Retail	1,105	133,169	766	0	288	13	133,509
8	thereof secured by mortgages / SMEs	35	999	22	0	8	–2	1,012
9	thereof secured by mortgages / non-SMEs	362	75,882	190	0	36	–3	76,054
10	thereof qualifying revolving	12	13,393	31	0	0	7	13,374
12	thereof other / SME	336	13,194	235	0	85	1	13,296
13	thereof other / non-SMEs	360	29,702	289	0	158	9	29,773
14	Equity exposures IRB	0	0	0	0	0	0	0
	Other non-credit obligation assets	11	12,916	0	0	0	0	12,926
15	**Total IRB approach**	**3,529**	**424,580**	**2,174**	**0**	**561**	**100**	**425,934**
16	Central governments or central banks	0	42,427	12	0	0	2	42,415
17	Regional governments or local authorities	0	16,345	154	0	0	150	16,192
18	Public sector entities	0	4,606	1	0	0	0	4,606
19	Multilateral development banks	0	820	0	0	0	0	820
20	International organisations	0	377	0	0	0	0	377
21	Institutions	0	2,865	0	0	0	0	2,865
22	Corporates	0	8,463	15	0	0	2	8,449
23	thereof SMEs	0	796	2	0	0	1	794
24	Retail	0	8,688	88	0	6	4	8,600
25	thereof SMEs	0	64	8	0	0	0	56
26	Secured by mortgages on immovable property	0	2,183	3	0	0	0	2,181
27	thereof SMEs	0	4	0	0	0	0	4
28	Exposures in default[1]	329	0	182	0	22	–20	146
29	Items associated with particularly high risk	0	137	0	0	0	0	137
30	Covered bonds	0	13	0	0	0	0	13
31	Claims on institutions and corporates with a short-term credit assessment	0	17	0	0	0	0	17

EU CR1-A_cont.: Credit quality of exposures by exposure class and instrument

		a	b	c	d	e	f	g
	€m	Gross carrying values of		Specific credit risk adjustment	General credit risk adjustment	Accumulated write-offs	Credit risk adjustment charges of the period	Net values (a+b-c-d)
		defaulted exposures	non-defaulted exposures					
32	Collective investment undertakings	0	2,212	0	0	0	0	2,212
33	Equity exposures	0	973	0	0	0	0	973
34	Other exposures	0	2,809	0	0	0	0	2,809
35	**Total SACR**	**329**	**92,935**	**453**	**0**	**28**	**138**	**92,811**
36	**Total**	**3,858**	**517,515**	**2,627**	**0**	**589**	**238**	**518,745**
37	of which loans	3,539	308,808	2,360	0	117	234	309,988
38	of which debt securities	17	32,735	39	0	0	9	32,713
39	of which off-balance-sheet exposures	201	39,496	92	0	0	–20	39,605

[1] According to EBA-Q&A_2017_3481, for the gross carrying values of the first column „a“ of exposures in default (in line 28) in application of Art. 112(j) CRR, the original asset class should be named in addition. To keep the consistency of the table in regard of totals formation under column „g: net values“ or in line 35 „Total SACR“, the required assignment is given below as follows:
The gross carrying values of the exposures in default (row 28) in SACR in the value of €329m with a value of €250m evolved from positions in the asset class „corporates“ (line 22) and with a value of €78m from the asset class „retail“ (line 24) in the SACR.

EU CR1-B: Credit quality of exposures by industry or counterparty types

		a	b	c	d	e	f	g
	€m	Gross carrying values of		Specific credit risk adjustment	General credit risk adjustment	Accumulated write-offs	Credit risk adjustment charges of the period	Net values (a+b-c-d)
		defaulted exposures	non-defaulted exposures					
1	Production and manufactoring industry	1,090	102,817	644	0	154	–27	103,263
2	Energy and water supply	136	20,069	99	0	22	–28	20,106
3	Wholesale and retail trade; repairs	357	29,790	290	0	120	20	29,856
4	Transport and telecommunication	431	17,656	67	0	8	15	18,019
5	Other financial industry and insurances	127	32,945	138	0	131	29	32,933
6	Banks	38	68,046	92	0	5	6	67,992
7	Other financial industry and insurances	235	23,937	75	0	11	8	24,098
8	Real estate activities	494	32,102	232	0	44	44	32,363
9	Public administration and defence, compulsory social security	39	68,816	230	0	1	153	68,625
10	Private households	886	119,520	747	0	90	16	119,659
11	Others	26	1,818	13	0	2	0	1,831
12	**Total**	**3,858**	**517,515**	**2,627**	**0**	**589**	**238**	**518,745**

EU CR1-C: Credit quality of exposures by geography

		a	b	c	d	e	f	g
	€m	Gross carrying values of		Specific credit risk adjustment	General credit risk adjustment	Accumulated write-offs	Credit risk adjustment charges of the period	Net values (a+b-c-d)
		defaulted exposures	non-defaulted exposures					
1	Western Europe	2,443	387,839	1,636	0	419	257	388,645
2	thereof Germany	1,925	293,138	1,254	0	348	132	293,810
3	Switzerland	45	10,768	8	0	1	2	10,806
4	Great Britain	6	20,095	161	0	12	136	19,940
5	Italy	56	13,537	51	0	0	9	13,542
6	France	45	12,365	22	0	0	3	12,388
7	Netherlands	21	6,523	28	0	14	15	6,516
8	Spain	14	6,159	10	0	0	–14	6,164
9	Others	329	25,253	102	0	43	–27	25,480
10	Eastern Europe	1,160	47,595	768	0	169	–11	47,987
11	thereof Poland	1,028	37,814	674	0	117	17	38,168
12	Others	132	9,781	94	0	51	–28	9,819
13	North America	68	30,544	89	0	–2	1	30,523
14	thereof USA	68	25,964	88	0	–2	1	25,943
15	Others	0	4,580	1	0	0	0	4,580
16	Asia	81	39,063	88	0	0	–12	39,056
17	thereof China	0	7,401	6	0	0	–1	7,394
18	Japan	0	17,824	1	0	0	0	17,823
19	Others	81	13,838	81	0	0	–11	13,838
20	Latin America	32	6,594	20	0	4	2	6,606
21	Other regions	74	5,880	26	0	0	1	5,929
22	**Total**	**3,858**	**517,515**	**2,627**	**0**	**588.599**	**238**	**518,745**

EU CR1-D: Ageing of past-due exposures

		a	b	c	d	e	f
		Gross carrying values					
	€m	**≤ 30 days**	**> 30 days ≤ 60 days**	**> 60 days ≤ 90 days**	**> 90 days ≤ 180 days**	**> 180 days ≤ 1 year**	**> 1 year**
1	Loans and advances	1,805	968	1,319	255	416	1,241
2	Debt securities	0	0	0	0	0	0
3	**Total exposure**	**1,805**	**968**	**1,319**	**255**	**416**	**1,241**

EU CR1-E: Non-performing and forborne exposures

		a	b	c	d	e	f	g	h	i	j	k	l	m
		Gross carrying values of performing and non-performing exposures							**Accumulated impairment and provisions and negative fair value adjustments due to credit risk**				**Collaterals and financial guarantees received**	
	€m		**Of which performing but past due > 30 days and ≤ 90 days**	**Of which performing forborne**	**Of which non-performing[1]**				**On performing exposures**		**On non-performing exposures[1]**		**On non-performing exposures[1]**	**Of which forborne exposures**
						Off which defaulted	**Off which impaired[2]**	**Of which forborne**		**Of which forborne**		**Of which forborne**		
010	Debt securities	59,500	0	1	54	54	54	0	–110	0	–1	0	0	0
020	Loans and advances	326,526	267	1,954	3,933	3,806	3,018	1,517	–579	–68	–1,863	–583	1,159	1,095
030	Off-balance-sheet exposures	174,920		316	336	300		73	189	7	75	12	50	20

[1] Besides defaulted exposures, the non-performing exposures also include those cases, that do not show any default criterion, but due to the procedure of a forbearance measure for a probation period have to be staged as „non- performing".
[2] Defaulted exposures, not including fair value positions.

Table EU CR2-A below shows the total credit risk adjustments and changes therein in the second half of 2018. Claims or loan commitments under the IFRS categories AC and FVOCI and their corresponding loan loss provisions are included in the table. Increases and decreases, respectively, for estimated loan losses are given on a net basis (position 2/3).

The table EU CR2-B shows the changes in the stock of defaulted and impaired loans and debt securities. Claims or loan commitments under the IFRS categories AC and FVOCI are included in the table.

Further information on this is given in the Annual Report 2018.

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

		a	b
	€m	**Accumulated specific credit risk adjustment**	**Accumulated general credit risk adjustment**
1	**Balance as of 30 June 2018**	**2,495**	**0**
2/3	Increases due to amounts set aside / decreases due to amounts reversed for estimated loan losses during the period	42	0
4	Decreases due to amounts taken against accumulated credit risk adjustments	–387	0
5	Transfers between credit risk adjustments	389	0
6	Impact of exchange rate differences	20	0
7	Business combinations, including acquisitions and disposals of subsidiaries	0	0
8	Other adjustments	–21	0
9	**Balance as of 31 December 2018**	**2,537**	**0**
10	Recoveries on credit risk adjustments recorded directly to the statement of profit or loss	0	0
11	Specific credit risk adjustments directly recorded to the statement of profit or loss	–19	0

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

		a
	€m	**Gross carrying value defaulted exposures**
1	**Balance as of 30 June 2018**	**3,547**
2	Loans and debt securities that have defaulted or impaired since the last reporting period	164
3	Returned to non-defaulted status	–122
4	Amounts written off	–564
5	Other changes	305
6	**Balance as of 31 December 2018**	**3,330**

In table addCR1 below, we compare the expected loss of the preceding period for the non-defaulted portfolio with the realised losses related to the lending business over the reporting period. Losses incurred in the lending business refer to direct write-downs (net of write-ups) and the utilisation of loan loss provisions for claims classified as IRBA positions according to the CRR. Amounts recovered on written-down claims reduce the realised loss.

For the direct comparison of the realised loss to the expected loss it has to be considered that the realised loss comprises the utilisation of risk provisions and write-downs of defaulted assets across several reporting periods whereas the expected loss relates to a one-year horizon only.

Table addCR2 shows the realised losses related to the lending business over the last five years in detail by exposure class.

The significant reduction in realised losses compared to prior years is mainly due to the reclassification of the shipping portfolio to the fair-value approach as part of the transition to IFRS 9 in 2018. However, the expected loss as at year-end 2017 still includes ship financings.

addCR1: Expected and realised losses in the lending business since 2016

Exposure class €m	Expected loss as at 31.12.2017	Realised loss 2018	Expected loss as at 31.12.2016	Realised loss 2017	Expected loss as at 31.12.2015	Realised loss 2016
Central governments or central banks	30	6	34	0	34	0
Institutions	91	8	100	3	123	13
Corporates	515	325	796	843	998	854
thereof SMEs	70	–24	53	55	66	54
thereof specialised lending	192	65	537	554	726	535
thereof other	254	284	206	234	206	265
Retail	279	242	217	303	221	162
thereof SMEs	85	78	64	116	61	143
thereof secured by mortgages	65	39	62	32	87	17
thereof qualifying revolving	21	1	14	7	15	2
thereof other	108	125	76	148	58	0
Total	**915**	**581**	**1,148**	**1,150**	**1,375**	**1,029**

addCR2: Expected and realised losses in the lending business 2014 until 2018

Exposure class €m	31.12.2018	31.12.2017	31.12.2016	31.12.2015	31.12.2014
Central governments or central banks	6	0	0	0	0
Institutions	8	3	13	97	2
Corporates	325	843	854	1,834	1,346
thereof SMEs	–24	55	54	87	0
thereof specialised lending	65	554	535	1,474	1,021
thereof other	284	234	265	273	325
Retail	242	303	162	232	223
thereof SMEs	78	116	143	80	0
thereof secured by mortgages	39	32	17	62	76
thereof qualifying revolving	1	7	2	2	1
thereof other	125	148	0	88	146
Total	**581**	**1,150**	**1,029**	**2,163**	**1,571**

Unlike in the Annual Report, the expected loss amounts reported in this Disclosure Report do not include SACR or securitisation positions. Also, due to the change to SACR (permanent partial use pursuant to Article 150 CRR) in 2009, the asset class Investments is not shown here.

Investments in the banking book

Investment risks or shareholder risks are potential losses arising from the provision of equity capital to investments as a result of a fall in their value. They can be caused by general market fluctuations or company-specific factors.

Composition of investments

Commerzbank's portfolio of holdings is broken down in accordance with its significance to business policy. The bulk of the investments held as financial assets (banking book) and holdings in consolidated companies are designed to further the Bank's business objectives by supporting business lines/segments in the Bank (segment-supporting investments) or by having a strategic management or service function for the Group as a whole (other strategic investments).

There are also other non-strategic investments, some of which are allocated to the Assets & Capital Recovery segment. A divestment concept is applied here, the aim of which is to optimise Commerzbank's market value, capital and income statement under appropriate market conditions.

Risk management

The investment risks are managed centrally as part of the ongoing management and monitoring of Commerzbank's holdings by the Group Finance department and locally by the segments. The central monitoring is primarily concentrated on the non-strategic investments, while the strategic investments that form part of the Bank's core business are controlled on a decentralised basis by the Commerzbank segments responsible for them. The strategic investments are mainly majority holdings.

Under the "three lines of defence" principle, aimed at protecting against undesirable risks and set out by Commerzbank in the Group Risik Strategy, the respective operational segments responsible therefore represent the first line of defence for investment risks, while Group Finance, as the area responsible for the investment risk strategy, represents the second line of defence.

Regulatory valuation of investments

The Commerzbank Group and accordingly the group companies included in the disclosure are, as IRBA banks as defined in Article 147 CRR, generally obliged to value investments in accordance with the IRBA rules. For investments entered into prior to 1 January 2008, Commerzbank has opted to apply grandfathering. These investment positions are temporarily excluded from the IRBA and treated in accordance with the SACR rules. They are given a risk weighting of 100%. The CRR also allows items to be permanently exempted from the IRBA. Since 31 December 2009 Commerzbank has applied the partial use option pursuant to section 70 sentence 1 no. 9b SolvV and Article 150 CRR, and uses the SACR permanently to value all investment positions which do not fall under the above-mentioned temporary grandfathering option. Investments that are associated with particularly high risk according to the definition under Article 128 CRR, such as private equity investments or venture capital investments, are recognised in the corresponding SACR asset class.

Commercial valuation and accounting

As a rule, equity instruments that are not valued using the equity method are reported at fair value. A valuation that differs from fair value can only be justified by the principle of materiality.

Listed investments are continuously monitored with regard to their market price development. External analysts' opinions and share price forecasts (consensus forecasts) are included in the risk assessment. Listed holdings are monitored by means of impairment tests carried out monthly by Group Finance in accordance with the impairment policy and tested for any significant qualitative or quantitative indicators (trigger events) of impairment. As soon as there are any indications of significant or lasting impairment, unrealised losses are written down.

Risks arising from unlisted investments are subject to regular monitoring involving a database-supported year-end valuation, a monitoring of trigger events for relevant holdings to each balance sheet reporting date and special monitoring of investments classified as critical. Various valuation methods (e.g. capitalised earnings value, net asset value, liquidation value) are used to quantify the risks, depending on the book value, status (e.g. active, inactive, in liquidation) and type of business activity (e.g. operational, property holding company, holding) of the investment. If the intention is to sell the investment, it will be written down, if necessary, to a lower expected selling price. For companies valued using the equity method, the valuation is equal to the proportionate IFRS equity capital.

Quantitative information on investments

This section covers investments as defined in Article 112 p) CRR. This means that only equity investments that are not consolidated for regulatory purposes but relate to the companies covered by this report are shown. The definition of an investment in CRR is wider than the usual accounting definition. For example, shares in limited companies (GmbHs), profit-sharing certificates with equity characteristics, promissory notes and derivative positions whose underlying is an investment position have to be classified as investments for regulatory purposes. Classical forms of investments nevertheless make up the majority of this CRR asset class.

The table below shows the book value and fair value of the investment instruments under IFRS as reported in the financial statements for the investment groups relevant to the Group's objectives and strategy.

INV1: Valuation of investment instruments

	Book value (IFRS)		Fair value		Market value (listed positions)	
Investment group | €m	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**
Segment-supporting investments	277	295	277	295	6	7
thereof listed positions	6	2	6	2	6	7
thereof unlisted positions	271	293	271	293	0	0
Other strategic investments	42	35	42	35	0	0
Other investments	424	481	424	481	0	0
Investments total	**744**	**811**	**744**	**811**	**7**	**7**

For listed positions the market value is given as well. For listed investments the book value under IFRS is their historic costs.

For unlisted companies the book values under IFRS are used as fair value. Special purpose vehicles (SPVs) are not shown as they are not investments pursuant to regulatory definitions. The positions shown under Other strategic investments are exclusively unlisted positions. Only €0.2m of the Other investments are listed positions. All unlisted positions are classified as adequately diversified investment portfolios.

Shares in investment funds are allocated to the investment group Funds and certificates if the precise composition of the investment fund is not known and an average risk weighting supplied by the investment company is not used for capital adequacy purposes. Only shares in investment funds that invest wholly or partly in investment instruments are relevant. Therefore, shares in investment funds that are solely invested in fixed-income securities (e.g. bond funds) are not included here.

Table INV2 below shows realised and unrealised profits and losses from investment instruments.

INV2: Realised and unrealised profits/losses from investment instruments

	valued using the equity method		not valued using the equity method	
€m	**Realised profits and losses from sale / liquidation of equity holdings**	**Revaluation gains and losses (FVOCI) and valuation profits and losses (P&L) from equity holdings**	**Profits and losses from equity instruments without the trading book**	**Revaluation gains and losses (FVOCI) from equity instruments**
2018	20	27	183	–3

The application of IFRS 9 led to changes in the classification and valuation of equity instruments.

As equity instruments do not result in any fixed repayments and are only associated with a share right, the SPPI (solely payment of principal and interest) criterion is not met. AC or FVOCI with a recycling valuation is therefore excluded.

However, when an equity instrument is added which was purchased as a conditional purchase price payment with trading intent or else within the scope of a company acquisition, an irrevocable decision may be made to value it in accordance with FVOCI, instead of FVPL, without the recycling method. All value fluctuations are reported as equity capital and not reported on the income statement even in case of the disposal of the financial instrument (without recycling). We have applied this option and have assigned a portfolio to this group.

With the application of IFRS 9, the figures are therefore not comparable with the previous year.

B. Counterparty credit risk (CCR)

Risk management

Counterparty credit risk (default risk from counterparty default risk) is defined as the risk of losses sustained or profits foregone due to the default of a counterparty in the context of a derivative or securities financing transaction. In addition to market price risks, derivative positions also give rise to default risks when a claim arises against the counterparty in the form of positive market values.

Commerzbank also looks at what is known as correlation risk (wrong way risk). This occurs when a counterparty's exposure and credit quality (rating) are negatively correlated. Wrong way risk is therefore an additional risk source, as the credit exposure is generally measured independently from the counterparty's creditworthiness. Commerzbank has a clear definition of specific and general wrong way risk. There are guidelines to assist in identifying and quantifying wrong way risk. They also set out how the exposure must be adjusted to allow for the wrong way risk. In the case of secured transactions, the potential relationship between the performance of the collateral and the credit rating of the counterparty also has to be considered and captured according to the Commerzbank collateral matrix.[1]

The derivative positions shown in the tables below do not include securitisation positions as defined in the CRR as these are shown in the securitisations chapter. This means that interest rate and currency swaps or credit derivative transactions entered into with special-purpose securitisation companies are not included.

Risk appetite is operationally structured in the Group Risik Strategy through a consistent management system with limits, benchmarks for risk strategy positioning and supplementary guidelines. The specific risk appetite for the lending business is derived from this and structured further in the credit risk strategy. The risk strategy focus of the credit risk strategy thus adopts the cross-segment benchmarks of the Group Risik Strategy that are relevant for the default risk and specifies them specifically for the lending business of the individual segments. Furthermore the limit concept of the Group Risik Strategy is supplemented by quantitative guidelines to limit risk concentrations and weaker credit ratings. Downstream policies operationalise the risk appetite at the level of selected sub-portfolios.

In order to minimise both the economic and the regulatory credit risk arising from these instruments, Commerzbank enters into master agreements (bilateral netting agreements) such as the 2002 ISDA Master Agreement or the German Master Agreement for Financial Futures with the respective counterparties. By means of such bilateral netting agreements, the positive and negative market values of the derivatives contracts included under a master agreement can be offset against one another, and the regulatory add-ons for future risks of these products can be reduced. This netting process reduces the credit risk to a single net claim on the contracting party (close-out netting). Table EU CCR5-A contains a detailed presentation of netting effects. The netting policy sets out the requirements for the external and internal netting of derivatives and repo transactions. For repo/lending transactions Commerzbank makes a distinction between "full netting" and "single transaction netting". Single transaction netting allows the netting of exposure and collateral in one transaction, while in full netting all transactions can be netted against each other.

For both regulatory reports and the internal measurement and monitoring of credit exposures, these risk-mitigating techniques are only used if Commerzbank considers them enforceable in the jurisdiction in question, should the counterparty become insolvent. Legal opinions are obtained from various international law firms in order to verify enforceability.

Similar to the master agreements are the collateral agreements (e.g. collateralisation annex for financial futures contracts, Credit Support Annex), which Commerzbank concludes with its business partners to secure the net claim or liability remaining after netting (receipt or provision of collateral). As a rule, this collateral management reduces credit risk by means of prompt, usually daily or weekly, measurement and adjustment of the customer exposure.

[1] Although in a regulatory context wrong way risk is normally mentioned in connection with counterparty risk, Commerzbank also considers it in connection with issuer risk (e.g. between the issuer of a bond and the guarantor).

Commerzbank only uses cash and securities pledged as collateral under master agreements. Table EU CCR5-B gives a detailed list of collateral provided and received.

Regulations for risk mitigation measures are stipulated by the "Guideline for Collateralized Trading". The guideline covers legal aspects such as types of master agreements and the enforceability of netting transactions and collateral under master agreements. It describes the requirements governing the netting of collateral and the structuring of Credit Support Annexes.

The basis for determining the netting amounts for the default risk from derivative positions is not the positive market values but instead the so-called credit equivalent values. To determine the assessment basis of derivative default risk positions, Commerzbank uses the internal model method (IMM) pursuant to Article 283 ff. CRR and the market valuation method pursuant to Article 274 CRR.

The approach to risk quantification under the IMM is generally based on a risk simulation which generates future market scenarios and creates portfolio valuations based on these scenarios. Netting and collateral agreements are taken into account.

In applying the internal model method, the EaD is defined per counterparty as the product of the alpha factor and the calculated effective expected positive exposure E*. Risks that are not taken into account when determining E*, correlation risks for example, are included in the capital adequacy calculation through the alpha factor. Banks can either estimate the alpha factor themselves or use the supervisory value of 1.4. Commerzbank does not estimate its own alpha factor, preferring instead to use the supervisory value to calculate exposure at default.

The credit equivalent values for the counterparty default risk from derivative positions and securities financing transactions – including exchange-traded derivatives – used to determine the (net) assessment basis amounted to €3,231m at the end of 2018 using the market valuation method and €19,871m using the internal model method (see table EU CCR1 – Analysis of counterparty credit risk by approach). The proportion of derivatives and securities financing transactions processed via central counterparties measured by EaD according to credit risk mitigation techniques was 9% as at the end of the year (see table EU CCR8 – Exposures to central counterparties (CCP). Table EU CCR4 provides an overview of the risk positions managed under the AIRB approach by exposure class and PD scale.

Credit equivalent values effectively correspond to the risk position values of balance-sheet default risk positions, as a credit conversion factor of 100% is applied to derivative positions.

All operative units, branches and subsidiaries are, subject to compliance with the regulations, authorised to use credit derivatives to hedge credit risks in loan portfolios (i.e. purchase of hedges). This allows them to hedge credit risks with a credit derivative without having to sell or assign the loan. A detailed list of credit derivatives can be found in table EU CCR6 – Credit derivatives exposures.

Commerzbank creates credit reserves (credit valuation adjustments, CVA) for derivatives, securities financing transactions and money market transactions reported at fair value in order to account for the counterparty's expected default risk. The offsetting of credit reserves compensates for the fair values of the transaction calculated on the basis of risk-free parameters. The CVA are determined by the sum of the discounted expected exposures until the end of the contract period of the transaction, weighted by the marginal probability of default of the counterparty and in consideration of the expected loss upon default of the counterparty. In order to calculate the expected exposure, Commerzbank uses a Monte Carlo simulation based on a risk-neutral calibration.

As part of the new regulatory requirements under Basel 3, since 2015 the Commerzbank Group has additionally calculated the capital requirements for credit value adjustments (CVA risk) according to Article 381 ff. CRR. For the portfolios of Commerzbank Aktiengesellschaft, CVA risk is calculated using the advanced method according to Article 383 CRR via a sensitivity-based approach. For the Group's subsidiaries, the standardised approach according to Article 384 CRR is applied. As at 31 December 2018 there were eligible hedges under Article 386 CRR: iTraxx Senior Financials of €400m and single name CDS of €147m. The capital requirements for CVA risk amounted to €276m (€3,451m RWA, see table EU CCR2 – CVA capital charge) as at 31 December 2018 for the Group.

Information on regulatory methods

EU CCR1: Analysis of CCR exposure by approach

		a	b	c	d	e	f	g
	€m	**Notional**	**Replacement cost/current market value**	**Potential future credit exposure**	**EEPE**	**Multiplier**	**EaD post CRM**	**RWAs**
1	Mark to market approach		2,771	684			3,231	1,324
2	Original exposure	0					0	0
3	Standardised approach		0			1.4	0	0
4	IMM (for derivatives and SFTs)				20,089	1.4	19,871	7,481
5	Of which securities financing transactions				7,488	1.4	7,536	859
6	Of which derivatives and long settlement transactions				12,601	1.4	12,336	6,622
7	Of which from contractual cross-product netting				0	1.4	0	0
8	Financial collateral simple method (for SFTs)						0	0
9	Financial collateral comprehensive method (for SFTs)						762	311
10	VaR for SFTs						0	0
11	**Total**							**9,116**

EU CCR2: CVA (credit value adjustments) capital charge

		a	b
	€m	**Exposure value**	**RWAs**
1	Total portfolios subject to the advanced method	5,240	3,169
2	(i) VaR component (including the 3× multiplier)		479
3	(ii) SVaR component (including the 3× multiplier)		2,690
4	All portfolios subject to the standardised method	232	283
EU4	Based on the original exposure method	0	0
5	**Total subject to the CVA capital charge**	**5,472**	**3,451**

EU CCR8: Exposures to CCP (central counterparties)

		a	b
	€m	**EaD post CRM**	**RWAs**
1	**Exposures to QCCPs (total)**		**172.5**
2	Exposures for trades at QCCPs (excluding initial margin and default fund contributions); of which	2,040	158.0
3	(i) OTC derivatives	397	25.2
4	(ii) Exchange-traded derivatives	880	17.6
5	(iii) SFTs	763	115.2
6	(iv) Netting sets where cross-product netting has been approved	0	0.0
7	Segregated initial margin	0	
8	Non-segregated initial margin	0	0.0
9	Prefunded default fund contributions	139	14.5
10	Alternative calculation of own funds requirements for exposures		0.0
11	**Exposures to non-QCCPs (total)**		**0.0**
12	Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions); of which	0	0.0
13	(i) OTC derivatives	0	0.0
14	(ii) Exchange-traded derivatives	0	0.0
15	(iii) SFTs	0	0.0
16	(iv) Netting sets where cross-product netting has been approved	0	0.0
17	Segregated initial margin	0	
18	Non-segregated initial margin	0	0.0
19	Prefunded default fund contributions	0	0.0
20	Unfunded default fund contributions	0	0.0

Information by regulatory risk-weighting approach

EU CCR4: IRB approach – CCR exposures by portfolio and PD scale

		a	b	c	d	e	f	g
	PD scale	EaD post CRM €m	Average PD %	Number of obligors	Average LGD %	Average maturity[1] years	RWAs €m	RWA density %
Central governments or central banks	0.00 to < 0.15	451	0.05	45	55.76	2.6	97	21.5
	0.15 to < 0.25	5	0.22	5	100.00	1.8	4	93.2
	0.25 to < 0.50	65	0.27	7	28.64	0.1	13	19.7
	0.50 to < 0.75	16	0.62	4	100.00	0.9	22	134.4
	0.75 to < 2.50	24	0.79	6	100.00	1.9	43	182.0
	2.50 to < 10.00	3	5.56	10	80.06	1.1	8	268.5
	10.00 to < 100.00	0	49.14	2	100.00	1.0	0	457.2
	100.00 (Default)	0	0.00	0	0.00	0.0	0	0.0
	Subtotal	**564**	**0.16**	**79**	**56.25**	**2.2**	**187**	**33.2**
Institutions	0.00 to < 0.15	6,887	0.05	320	51.81	2.4	2,376	34.5
	0.15 to < 0.25	329	0.18	81	54.88	2.5	204	62.0
	0.25 to < 0.50	727	0.34	111	51.18	2.1	550	75.7
	0.50 to < 0.75	122	0.61	46	50.05	2.2	128	105.0
	0.75 to < 2.50	112	1.25	103	48.30	2.3	140	125.0
	2.50 to < 10.00	196	7.39	64	45.17	2.3	392	200.5
	10.00 to < 100.00	84	10.87	6	42.50	0.6	173	205.6
	100.00 (Default)	0	0.00	0	0.00	0.0	0	0.0
	Subtotal	**8,457**	**0.38**	**731**	**51.56**	**2.3**	**3,964**	**46.9**
Corporates TOTAL	0.00 to < 0.15	2,832	0.04	2,008	33.42	2.0	593	20.9
	0.15 to < 0.25	3,049	0.18	1,246	39.61	2.0	1,107	36.3
	0.25 to < 0.50	1,339	0.34	1,846	42.87	2.0	808	60.4
	0.50 to < 0.75	441	0.58	1,002	42.13	2.8	356	80.7
	0.75 to < 2.50	235	1.14	1,626	41.25	2.0	226	96.1
	2.50 to < 10.00	669	4.10	602	42.25	2.4	1,273	190.3
	10.00 to < 100.00	36	18.12	142	38.72	2.3	74	205.8
	100.00 (Default)	3	100.00	46	72.75	1.9	1	27.9
	Subtotal	**8,604**	**0.83**	**4,257**	**38.90**	**2.4**	**4,437**	**51.6**
Corporates, thereof SMEs	0.00 to < 0.15	115	0.04	180	41.66	3.6	21	18.4
	0.15 to < 0.25	74	0.18	88	61.91	4.3	52	69.8
	0.25 to < 0.50	26	0.35	157	50.68	2.0	14	52.7
	0.50 to < 0.75	9	0.58	107	60.73	3.4	9	103.8
	0.75 to < 2.50	56	1.48	326	52.28	3.2	64	114.7
	2.50 to < 10.00	10	4.10	141	49.73	2.4	13	129.3
	10.00 to < 100.00	2	34.36	34	47.70	2.3	3	176.2
	100.00 (Default)	3	100.00	15	82.49	3.1	1	28.1
	Subtotal	**295**	**1.76**	**1,048**	**50.86**	**3.5**	**176**	**59.8**
Corporates, thereof specialised lending	0.00 to < 0.15	0	0.00	0	0.00	0.0	0	0.0
	0.15 to < 0.25	0	0.00	0	0.00	0.0	0	0.0
	0.25 to < 0.50	0	0.00	0	0.00	0.0	0	0.0
	0.50 to < 0.75	0	0.00	0	0.00	0.0	0	0.0
	0.75 to < 2.50	0	0.00	0	0.00	0.0	0	0.0
	2.50 to < 10.00	0	0.00	0	0.00	0.0	0	0.0
	10.00 to < 100.00	0	0.00	0	0.00	0.0	0	0.0
	100.00 (Default)	0	0.00	0	0.00	0.0	0	0.0
	Subtotal	**0**	**0.00**	**0**	**0.00**	**0.0**	**0**	**0.0**

[1] Parameter is not subject to the RWA calculation for retail business. Hence, in compliance with EBA/GL/2016/11, no disclosure for retail business.

EU CCR4_cont.: IRB approach – CCR exposures by portfolio and PD scale

		a	b	c	d	e	f	g
	PD scale	EaD post CRM €m	Average PD %	Number of obligors	Average LGD %	Average maturity[1] years	RWAs €m	RWA density %
Corporates, thereof other	0.00 to < 0.15	2,716	0.08	824	33.42	2.0	571	21.0
	0.15 to < 0.25	2,975	0.18	535	39.61	2.0	1,055	35.5
	0.25 to < 0.50	1,313	0.34	766	42.87	2.6	795	60.5
	0.50 to < 0.75	433	0.59	394	42.13	2.8	347	80.2
	0.75 to < 2.50	179	1.14	487	41.25	2.0	161	90.3
	2.50 to < 10.00	659	6.58	160	42.25	4.8	1,260	191.2
	10.00 to < 100.00	34	18.12	37	38.72	4.4	71	207.1
	100.00 (Default)	0	100.00	8	72.75	1.9	0	14.3
	Subtotal	**8,309**	**0.80**	**3,209**	**38.47**	**2.4**	**4,261**	**51.3**
Retail	0.00 to < 0.15	62	0.04	4054	45.52		4	5.7
	0.15 to < 0.25	7	0.18	498	46.31		1	16.7
	0.25 to < 0.50	5	0.37	558	45.11		1	24.2
	0.50 to < 0.75	3	0.63	272	47.57		1	32.2
	0.75 to < 2.50	12	1.32	1,190	45.23		6	50.7
	2.50 to < 10.00	3	4.69	336	47.18		2	62.5
	10.00 to < 100.00	0	21.59	45	50.98		0	87.5
	100.00 (Default)	0	100.00	22	29.97		0	18.7
	Subtotal	**93**	**0.54**	**3,510**	**46.82**		**15**	**16.4**
Total	**0.00 to < 0.15**	**10,232**	**0.04**	**3,396**	**33.42**	**1.1**	**3,069**	**30.0**
	0.15 to < 0.25	**3,390**	**0.18**	**958**	**39.61**	**1.0**	**1,316**	**38.8**
	0.25 to < 0.50	**2,137**	**0.27**	**1,320**	**28.64**	**0.1**	**1,373**	**64.3**
	0.50 to < 0.75	**583**	**0.58**	**687**	**42.13**	**0.9**	**507**	**87.0**
	0.75 to < 2.50	**382**	**0.79**	**1,517**	**41.25**	**1.1**	**415**	**108.5**
	2.50 to < 10.00	**870**	**4.10**	**543**	**42.25**	**1.1**	**1,675**	**192.5**
	10.00 to < 100.00	**121**	**10.87**	**124**	**38.72**	**0.6**	**248**	**205.5**
	100.00 (Default)	**3**	**100.00**	**34**	**29.97**	**1.9**	**1**	**27.7**
	Total (all portfolios)	**17,718**	**0.59**	**8,577**	**45.53**	**2.4**	**8,603**	**48.6**

[1] Parameter is not subject to the RWA calculation for retail business. Hence, in compliance with EBA/GL/2016/11, no disclosure for retail business.

EU CCR4_cont.: IRB approach – CCR exposures by retail sub-portfolio and PD scale

		a	b	c	d	e	f	g
	PD scale	EaD post CRM €m	Average PD %	Number of obligors	Average LGD %	Average maturity[1] years	RWAs €m	RWA density %
Retail	0.00 to < 0.15	62	0.04	4,054	45.52		4	5.7
	0.15 to < 0.25	7	0.18	498	46.31		1	16.7
	0.25 to < 0.50	5	0.37	558	45.11		1	24.2
	0.50 to < 0.75	3	0.63	272	47.57		1	32.2
	0.75 to < 2.50	12	1.32	1,190	45.23		6	50.7
	2.50 to < 10.00	3	4.69	336	47.18		2	62.5
	10.00 to < 100.00	0	21.59	45	50.98		0	87.5
	100.00 (Default)	0	100.00	22	29.97		0	18.7
	Subtotal	**93**	**0.54**	**3,510**	**46.82**		**15**	**16.4**
…secured by mortgages / SMEs	0.00 to < 0.15	0	0.00	0	0.00		0	0.0
	0.15 to < 0.25	0	0.00	0	0.00		0	0.0
	0.25 to < 0.50	0	0.00	0	0.00		0	0.0
	0.50 to < 0.75	0	0.00	0	0.00		0	0.0
	0.75 to < 2.50	0	0.00	0	0.00		0	0.0
	2.50 to < 10.00	0	0.00	0	0.00		0	0.0
	10.00 to < 100.00	0	0.00	0	0.00		0	0.0
	100.00 (Default)	0	0.00	0	0.00		0	0.0
	Subtotal	**0**	**0.00**	**0**	**0.00**		**0**	**0.0**
…secured by mortgages / non-SMEs	0.00 to < 0.15	0	0.00	0	0.00		0	0.0
	0.15 to < 0.25	0	0.00	0	0.00		0	0.0
	0.25 to < 0.50	0	0.00	0	0.00		0	0.0
	0.50 to < 0.75	0	0.00	0	0.00		0	0.0
	0.75 to < 2.50	0	0.00	0	0.00		0	0.0
	2.50 to < 10.00	0	0.00	0	0.00		0	0.0
	10.00 to < 100.00	0	0.00	0	0.00		0	0.0
	100.00 (Default)	0	0.00	0	0.00		0	0.0
	Subtotal	**0**	**0.00**	**0**	**0.00**		**0**	**0.0**
…qualified revolving	0.00 to < 0.15	0	0.00	0	0.00		0	0.0
	0.15 to < 0.25	0	0.00	0	0.00		0	0.0
	0.25 to < 0.50	0	0.00	0	0.00		0	0.0
	0.50 to < 0.75	0	0.00	0	0.00		0	0.0
	0.75 to < 2.50	0	0.00	0	0.00		0	0.0
	2.50 to < 10.00	0	0.00	0	0.00		0	0.0
	10.00 to < 100.00	0	0.00	0	0.00		0	0.0
	100.00 (Default)	0	0.00	0	0.00		0	0.0
	Subtotal	**0**	**0.00**	**0**	**0.00**		**0**	**0.0**
…other / SMEs	0.00 to < 0.15	4	0.09	145	45.52		0	8.2
	0.15 to < 0.25	4	0.21	208	46.47		1	15.5
	0.25 to < 0.50	5	0.37	254	48.33		1	23.5
	0.50 to < 0.75	3	0.63	128	47.57		1	31.1
	0.75 to < 2.50	5	1.32	350	45.23		2	40.2
	2.50 to < 10.00	2	4.69	163	49.28		1	58.0
	10.00 to < 100.00	0	21.59	45	50.98		0	87.5
	100.00 (Default)	0	100.00	9	56.91		0	18.7
	Subtotal	**23**	**1.24**	**1,302**	**46.86**		**7**	**28.1**
…other / non-SMEs	0.00 to < 0.15	58	0.04	1,882	46.70		3	5.5
	0.15 to < 0.25	3	0.18	41	46.31		1	18.5
	0.25 to < 0.50	1	0.37	25	45.11		0	28.5
	0.50 to < 0.75	0	0.66	8	47.67		0	42.1
	0.75 to < 2.50	7	1.41	245	48.14		4	59.1
	2.50 to < 10.00	1	5.04	5	47.18		1	73.8
	10.00 to < 100.00	0	0.00	0	0.00		0	0.0
	100.00 (Default)	0	100.00	2	29.97		0	18.7
	Subtotal	**70**	**0.31**	**2,208**	**46.81**		**9**	**12.5**

[1] Parameter is not subject to the RWA calculation for retail business. Hence, in compliance with EBA/GL/2016/11, no disclosure for retail business.

EU CCR7: RWA flow statements of CCR exposures under the IMM

		a	b
	€m	Risk weighted assets (RWAs)	Capital requirements
1	**RWA at previous quarter end**	**7,279**	**582**
2	Asset size	363	29
3	Credit quality of counterparties	–28	–2
4	Model updates	28	2
5	Methodology and policy	0	0
6	Acquisitions and disposals	0	0
7	Foreign exchange movements	–7	–1
8	Other	0	0
9	**RWA at the end of the reporting period**	**7,635**	**611**

The RWA increase mainly results from an increase of a single exposure.

EU CCR3: Standardised approach – CCR exposures by regulatory portfolio and risk

	Exposure classes | €m	Risk weight											Total	Of which unrated
		0%	2%	4%	10%	20%	50%	70%	75%	100%	150%	Other		
1	Central governments or central banks	3,228	0	0	0	0	0	0	0	0	0	0	3,228	3,228
2	Regional governments or local authorities	674	0	0	0	0	0	0	0	0	0	0	674	674
3	Public sector entities	1,455	0	0	0	133	0	0	0	0	0	0	1,588	1,588
4	Multilateral development banks	0	0	0	0	0	0	0	0	0	0	0	0	0
5	International organisations	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Institutions	3	517	116	0	91	111	0	0	17	0	0	855	625
7	Corporates	0	748	0	0	658	26	0	0	339	0	0	1,771	1,743
8	Retail	0	0	0	0	0	0	0	24	0	0	0	24	24
9	Durch Immobilien besichert	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Exposures in default	0	0	0	0	0	0	0	0	0	1	0	1	1
11	Items associated with particularly high risk	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Covered bonds	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Institutions and corporates with a short-term credit assessment	0	0	0	0	27	1	0	0	1	0	0	29	0
14	Collective investment undertakings	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Equity exposure	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Other items	0	0	0	0	0	0	0	0	0	0	0	0	0
17	**Total**	**5,360**	**1,265**	**116**	**0**	**909**	**138**	**0**	**24**	**357**	**1**	**0**	**8,171**	**7,884**

Further information on counterparty credit risk

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

		a	b	c	d	e
	€m	Gross positive fair value or net carrying amount	Netting benefits	Netted current credit exposure	Collateral held	Net credit exposure
1	Derivatives	115,325	90,626	24,699	13,649	11,050
2	SFTs (securities financing transactions)	118,783	110,032	8,751	1,491	7,260
3	Cross-product netting	0	0	0	0	0
4	**Total**	**234,108**	**200,658**	**33,450**	**15,140**	**18,310**

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

		a	b	c	d	e	f
		Collateral used in derivative transactions				Collateral used in SFTs	
	€m	Fair value of collateral received		Fair value of posted collateral		Fair value of collateral received	Fair value of posted collateral
		Segregated	Unsegregated	Segregated	Unsegregated		
1	Cash	269	14,243	0	17,884	337	2,180
2	Sovereign Bonds	0	824	0	5,180	113	5,357
3	Other Bonds	0	1,591	0	785	333	2,281
4	Equities	0	0	0	0	956	6,255
5	Other collateral	0	0	0	459	0	0
6	**Total**	**269**	**16,659**	**0**	**24,307**	**1,739**	**16,073**

EU CCR6: Credit derivatives exposures

		a	b	c
	€m	Credit derivative hedges		Other credit derivatives
		Protection bought	Protection sold	
1	Notionals			
2	Single-name credit default swaps	3,128	1,984	10,990
3	Index credit default swaps	0	600	6,273
4	Total return swaps	0	0	1,205
5	Credit options	0	0	0
6	Other credit derivatives	0	0	0
7	**Total notionals**	**3,128**	**2,584**	**18,468**
8	**Fair values**			
9	**Positive fair value (asset)**	**761**	**50**	**202**
10	**Negative fair value (liability)**	**21**	**705**	**222**

Contractual agreements that oblige Commerzbank to provide additional collateral to its counterparties in the event of a downgrading of its own rating are governed in the Credit Support Annexes which are established as part of the netting master agreements for OTC derivative business.

The counterparty ratings (from Standard & Poor's, Moody's and FitchRatings) are automatically uploaded on a daily basis via interfaces with Reuters, Telerate or Bloomberg into the collateral management system, which can simulate downgrade scenarios if necessary. This makes it possible to carry out an advance analysis of the potential effects on the collateral amounts. Commerzbank regularly reviews these collateral amounts as part of its stress test assuming a simultaneous two-notch downgrade by the three big rating agencies.

addCCR1: Additional contractual obligations (in stress test)

Additional contractual obligations | €m	
Contractual derivative outflows and margin calls	120
thereof collateralised interest rate derivatives	100
thereof uncollateralised interest rate derivatives	20
Other contractual outflows and margin calls	50
Total 2018	**170**
Total 2017	634

C. Securitisations (SEC)

Securitisation process

In securitisation business Commerzbank performs the three roles provided for in regulatory legislation, namely originator, sponsor and investor.

› **Originator** Parts of the Bank's own loan portfolio are placed selectively on the capital markets through securitisation transactions. The transfer of the credit risk is mainly by means of synthetic securitisations where the portfolio is hedged through financial guarantee contracts. As at 31 December 2018, of the outstanding securitisations of Commerzbank, risk exposures of €5.5bn (securitised volume €5.9bn) were retained. By far the largest portion of these positions is accounted for by €5.3bn of senior tranches, which are nearly all rated good or very good. As at the reporting date, Commerzbank's securitisation transactions placed on the capital markets and used to free up regulatory capital were as follows:

SEC1: Securitisation transactions with regulatory capital relief

Securitisation programme[2]	Type[1]	Securitisation pool	Maturity	Issue currency	Current volume | €m
CoSMO Finance III–1	S	Corporates	2025	EUR	1,011
Coco Finance II–2	S	Corporates	2025	EUR	1,275
CoSMO Finance III–2	S	Corporates	2026	EUR	2,020
Coco Finance III–1	S	Corporates	2026	EUR	1,511
CB MezzCAP	T	Corporates	2036	EUR	71
Total Commerzbank AG					**5,888**

[1] S = synthetic, T = True sale.
[2] Securatisation of own customer receivables.

In addition, the SME Commerz SCB GmbH transaction (original volume €1.5bn) continues, which does not qualify for capital relief for regulatory purposes. In the reporting year, due to the structure of the transactions Commerzbank did not hold any securitisation exposures for which additional capital was required as a result of an investor share to be taken into consideration by the originator under Articles 256 and 265 CRR. In addition, during the reporting year Commerzbank provided no implicit support within the meaning of Article 248 CRR. Where Commerzbank cooperated with rating agencies in connection with originator securitisation transactions (synthetic), the agency in question was Moody's. The assets securitised by Commerzbank belong to the Bank and derive from its lending business with small and medium-sized business customers and from business with large customers. As part of the overall management of the Bank, the Commerzbank Group constantly reviews opportunities to securitise its own assets. This process is primarily influenced by the market conditions prevailing at any one time. At the reporting date, the placement of at least two further securitisation transactions is planned for the first half of 2019. These are the Helgoland SME-1 transaction with a volume of €2bn, which does not qualify for capital relief for regulatory purposes, and the Coco III-2 transaction with a volume of €1.5bn. Its underlyings will be European, mainly German, corporate and small and medium-sized business loans.

› **Sponsor** By securitising their own portfolios of receivables, i.e. selling their receivables on a non-recourse basis, Commerzbank's customers are able to tap alternative sources of funding on the capital markets. Structuring, arranging and securitising these receivables portfolios, particularly those of customers in the Corporate Clients segment, is a key component of the structured finance product range. Special purpose vehicles (purchasing entities) are typically established to manage these assets. The purchases of receivables are funded primarily by the issue of short-term commercial papers (CPs) under the Bank's asset-backed commercial paper (ABCP) programme Silver Tower (conduit). The commercial papers issued are rated by Standard & Poor's, Moody's and FitchRatings. As sponsor, the Bank is responsible for structuring and, as a rule, purchasing and refinancing the transactions. Commerzbank provides the special purpose vehicles with liquidity facilities so that they have access to short-term liquidity.

These liquidity facilities are counted in full when determining the risk-weighted exposures. The mainly high diversified portfolios of receivables generally derive from customers' working capital, such as trade receivables and car, machinery and equipment leases. The receivables portfolios therefore reflect the differing businesses of those selling the receivables. The volume in the Silver Tower conduit was reduced by €0.1bn to €3.9bn in 2018. The securitisation exposures deriving from the Silver Tower conduit largely consist of liquidity facilities and back-up lines. In the period under review, Commerzbank did not sell investment products resulting from its role as originator to companies that are managed or adviced in investments by Commerzbank.

› **Investor** The Commerzbank Group invests under its regulatory banking book in securitisation positions. The Bank's internal credit risk strategy provides limited scope for entering into new securitisation positions provided that the risk profile of each securitisation position is subjected to a differentiated analysis and documentation. This allows transaction risk drivers that may impact directly or indirectly on the securitised position's risk content to be taken into account. In the year under review Commerzbank invested in senior-ranking securitisation positions, mainly backed by pools of corporate loans and consumer loans.

Risk management

The internal processes for monitoring the risk profile of securitisation exposures are based on the provisions of Articles 406 and 408 CRR and on the principles of the Minimum Requirements for Risk Management (MaRisk) as amended. They apply equally to all securitisation exposures, irrespective of whether they are part of the regulatory trading or banking book, or whether Commerzbank acts as the originator, sponsor or investor.

The processes put in place by the Bank take account of the individual risk profile of securitisation exposures on the basis of a wide range of information sources. They ensure that various risks directly and indirectly affecting the probability of default of the securitised positions are monitored in a continuous and timely manner. This also includes carrying out regular stress tests that take account of macroeconomic factors and the individual risk profile of the securitised positions.

› **Originator** The credit process for loans to customers does not distinguish between loans which the Bank will securitise at a later date and those for which it will continue to assume the risk. Transactions which allow reliefs in capital for regulatory purposes are subject to a monitoring process that ensures the continuous compliance with the regulations on significant risk transfer according to Articles 243 and 244 CRR. The amount to be retained in securitisation transactions in accordance with Article 405 CRR is reviewed regularly and published in the Investor Report. A potential placement risk for Commerzbank's transactions is taken fully into account, as the receivables are included in full in the Bank's risk and capital management process up until the actual risk transfer by means of securitisation and placement.

› **Sponsor** The customer transactions funded via conduits are subject to an ongoing credit process. A risk analysis of the transactions is conducted when the transactions are structured and again in regular reviews which are carried out annually and as circumstances require. A rating is assigned using the ABS rating systems certified by the banking regulators (internal assessment approach). For this purpose we take into account all significant risk drivers of the securitised receivables portfolio (e.g. type of receivable, default rates, collateral provided, diversification, dilution risks, commingling risks) and of the securitisation structure (e.g. whether the creditor claims have a waterfall structure, credit enhancements). Qualitative risk drivers ascertained from regular on-site visits to the seller of receivables as well as the seller's financial position are also taken into account. For trade receivables, structure-inherent covers through credit insurance are taken into account in the rating model and credit analysis. Credit insurance is used in order to mitigate concentration risk. The main counterparties here are Euler Hermes Deutschland, the German branch of Euler Hermes SA and the German branch of Compagnie Française d'Assurance pour le Commerce Extérieur SA (Coface). Before any purchase of customer receivables, the minimum conditions agreed in the contract documentation are reviewed and any non-qualifying receivables are excluded. After the receivables have been bought, their quality is reviewed continuously. If any potential problems come to light another credit analysis of the structure is carried out.

› **Investor** Strict internal guidelines must be followed when acquiring a new securitisation position. Such positions are subject to a specific internal credit process that also ensures that the specific requirements for securitisation positions regarding due diligence and retention under Articles 405-406 CRR are met. In the credit process applied to the Bank's securitisation portfolio, the risk profile of the securitisation positions is analysed quarterly or as circumstances require. In preparing a credit assessment, at the level of the individual tranche a securitisation-specific rating system is used which has been developed internally within the Bank, while external standard models are also applied. In the case of resecuritisations, the analysis relates not only to the securitisation exposures contained in the pool but also covers the underlying portfolios on a risk basis (look-through principle). As with securitisation exposures, the ranking of the individual tranches contained in the pool within a securitisation structure are taken into account in this analysis, as are the specific features of the asset classes and of the different jurisdictions, in order to generate the expected aggregate cash flow. The results are then used to model the entire waterfall structure at the level of the resecuritisation.

Commerzbank takes into account not only the original default risk of the securitised receivables but also secondary risks such as market value risk, liquidity risk, legal risk and operational risk insofar as they are relevant with a direct or indirect impact on the default risk. This process looks, for example, at the performance reports for the securitised receivables, changes in external ratings and movements in the market value of the securitisation exposures.

When determining market price risk, changes relating to interest rates, foreign currency rates or credit spreads, among others, are taken into account for the risk assessment of each tranche. In addition, the combination of various conventional risk measures (e.g. VaR) ensures the appropriate management of market risk concentrations at Group level.

Liquidity risk refers in this context to the risk that Commerzbank will be unable to meet its payment obligations on a day-to-day basis. Liquidity risks from ABS transactions are modelled conservatively in the internal liquidity risk model. Firstly, a worst case assumption is made that Commerzbank has to take on virtually the entire funding of the purchase facilities provided to the special purpose vehicles under the Silver Tower conduit. Secondly, the Bank's holdings of securitisation transactions only qualify as liquid assets if they are eligible for rediscount at the European Central Bank. These positions are only included in the liquidity risk calculation after applying conservative discounts. With regard to the Silver Tower conduit, it is assumed not only that external refinancing of the conduit will be replaced by Commerzbank on expiry, but also that additional drawdowns on credit lines by customers of the conduit will have to be refinanced by Commerzbank.

Legal risk in the context of securitisation transactions is the risk that the Bank might suffer losses as a result of flaws in legal transaction structures or as a result of missing or flawed legal documentation. Commerzbank's independent Legal department is responsible for examining legal structures and all transaction contracts. In terms of content, risks are divided into those arising from the sphere of the originator itself or those directly connected with the portfolio to be securitised. The subsequent refinancing and collateral structure is also a key element of legal structuring and risk assessment.

As well as being associated with legal risk as a risk type under the overall heading of operational risk, securitisation business is subject to the Group-wide management of operational risks. It therefore falls within the framework of the certified advanced measurement approach used by Commerzbank to measure operational risks.

Valuation methods and quantitative information

Regulatory valuation of securitisations

Securitisation positions in the banking book In the reporting period, Commerzbank applied the regulations of both the IRBA and the SACR for regulatory purposes.

› **Originator** The ratings-based approach is used for externally rated securitisation exposures that have been retained from the Commerzbank Group's own securitisation transactions. Capital is held against synthetic securitisation tranches that have been placed on the market based on the risk weighting of the party providing the collateral. Counterparties to the hedging instruments used, e.g. financial guarantees, are institutional investors, whose deposits serve as collateral, as well as multilateral development banks. For all synthetic transactions the supervisory formula approach (SFA) is used.

› **Sponsor** The overwhelming majority of sponsor transactions have to be allocated to the conduit business. Only in a few cases does Commerzbank hold other sponsor positions. Under the internal assessment approach (IAA), ABS rating systems certified by the supervisory authority are used for the Silver Tower conduit sponsored by Commerzbank. In the reporting period, we applied our own rating systems to the Silver Tower conduit for the following classes of receivables: trade receivables, car finance and leasing, equipment leasing and consumer lending. The rating systems are developed in accordance with the stipulations of regulatory requirements, independently of the front office, by Commerzbank's risk function. In accordance with the CRR, the methodology follows the guidelines of the rating agencies Standard & Poor's, Moody's and FitchRatings. The systems were certified at the outset by BaFin and the Bundesbank. They are subject to a regular review by the supervisors and internal audit. In addition, the internal assessment approach is subject to an annual validation by Commerzbank's risk function.

The various internal assessments take account of all features of the securitised receivables portfolio identified by the rating agencies as significant risk drivers as well as the specific structuring characteristics of the securitisation exposure. Other quantitative and qualitative risk components that are regarded as material by Commerzbank are also included in the assessment. These include, in particular, seller risks and qualitative risk drivers that are evaluated via structured qualitative questionnaires. The result of the rating process is a tranche-specific rating derived from the quantitative and qualitative results of the assessment approach. Depending on the specific approach used, this rating is based on the probability of default or expected loss (EL) of the securitised tranche. No external ratings from the above-mentioned rating agencies are available for the securitisation exposures subject to the internal assessment approach. The results of the internal assessment approach are used to determine regulatory capital requirements. They are also used within the internal capital model, in portfolio monitoring and in setting limits (ICAAP processes).

The approaches to modelling probability of default or expected loss (EL) for securitisation tranches differ depending on the type of securitised asset class. For the asset classes trade receivables, car finance and leasing, equipment leasing and consumer lending, a range of different stress factors used by the rating agencies are applied, depending on the main risk drivers for the relevant transactions. These are, for example, stress factors on concentration risks, default risks, dilution risks and interest rate risks. Quantitative and qualitative modelling components devised by the Bank are also used. When calculating loss buffers, stress factors are determined individually for different securitised asset types on the basis of the risk profiles of the securitisation transactions. Furthermore, the practice of making a capital deduction where no applicable external rating is available and the supervisory formula approach (SFA) are both used in a single case each.

› **Investor** For investor positions, external ratings are generally available and lead to the ratings-based approach (RBA) being applied. Commerzbank takes account of all available external ratings of securitisation positions issued by the rating agencies nominated by Commerzbank, namely Standard & Poor's, Moody's and FitchRatings. It does so irrespective of the type of receivables securitised and the type of securitisation exposure. A very small portion of investor positions is covered by guarantees from guarantors including the European Investment Fund (EIF). The guarantee is taken into account in the calculation of RWAs by substituting the risk weighting of the guarantor for the risk weighting of the securitisation. The look-through approach is used to a limited extent. In just a few cases a capital deduction is used due to the lack of an applicable external rating.

Companies which are consolidated within the Commerzbank Group for regulatory purposes may, as part of the Group-wide business and risk strategy, act as investors in securitisation transactions in which the Bank is acting as sponsor or originator.

Commerzbank currently only holds securitisation exposures from transactions where it acts as sponsor or originator. All retentions or repurchases of securitisation exposures from the Bank's own transactions with recognised regulatory risk transfer and securitisation exposures from transactions where Commerzbank has acted as sponsor are taken into account when determining the regulatory capital requirement. In the case of transactions without recognised regulatory risk transfer, the regulatory capital requirement is determined for the securitised portfolio.

Securitisation exposures in the trading book As at 31 December 2018, the majority of securitisation positions included in the trading book are hedged against performance-induced market price risks by means of credit default swaps with counterparties of good credit quality. In addition, further positions are allocated to the correlation trading book. The capital adequacy requirements are determined by application of the provisions of Articles 337 and 338 CRR relevant for securitisation exposures.

Valuation and accounting procedures

In true sale or synthetic securitisation transactions via special purpose vehicles, IFRS accounting regulations require the Bank to review whether or not the securitising special purpose vehicles need to be consolidated in accordance with IFRS 10. This review process is centralised in the Commerzbank Group in the accounting department. The central unit is informed of the establishment or restructuring of a special purpose vehicle. On the basis of the information submitted, it carries out a review to determine whether or not the special purpose vehicle needs to be consolidated.

› **Originator** If the special purpose vehicle is consolidated as part of the Commerzbank Group, no further derecognition test is carried out under IFRS 9. The asset is not derecognised in this case. If the special purpose vehicle does not have to be consolidated, in true sale securitisations the possible derecognition of the securitised receivables from the balance sheet is assessed. Following an assessment of the risks and rewards of ownership as the primary derecognition criterion and the control concept as the secondary derecognition criterion according to IFRS 9.3.2, a derecognition or partial derecognition (continuing involvement) is reported where appropriate. In the case of synthetic securitisations, the underlying receivables remain on the balance sheet. As with securitised receivables in true sale securitisations that are not derecognised, they are reported in their original IFRS category. These receivables continue to be accounted for in accordance with the rules for this IFRS category. Where securitised receivables are derecognised, any resultant gains or losses are recognised in the income statement. In some cases, the derecognition of receivables may lead to the first-time recognition of new exposures, for example bonds issued by special purpose vehicles. Under IFRS these exposures are categorised on the basis of the intention with which the securities were acquired and the type of securities according to IFRS 9 (FVTPL, Amortised Cost and FVOCI). Please refer to the notes to the IFRS Group financial statements (Notes to the balance sheet, from page 189 onwards) for a detailed explanation of the classification rules and the related valuation procedures. No securitisation transactions leading to derecognition of receivables were carried out in the period under review. As a result, no gains or losses were realised from the sale of receivables in connection with securitisation transactions during the reporting period.

The securitising special purpose vehicle for the transaction Coco Finance II–2 Ltd. is currently consolidated for accounting purposes. However, these entity is not consolidated for regulatory purposes. CB MezzCap Limited Partnership is currently not consolidated either for accounting purposes or for the purposes of regulatory capital adequacy requirements. If assets are earmarked for securitisation, this has no direct impact on their accounting treatment or measurement within the applicable IFRS categories.

› **Sponsor** Under IFRS the funding entities Silver Tower Funding Ltd and Silver Tower US Funding LLC are not consolidated under Silver Tower. No purchasing entities are consolidated either. Moreover, no purchasing or funding entities are consolidated under Silver Tower for regulatory purposes. If a beneficiary special purpose vehicle is not consolidated under IFRS, the liquidity line provided to it is recorded in the notes to the Annual Report as a contingent liability in its full unutilised amount. Any utilised amount is recognised as a receivable in the relevant IFRS category.

› **Investor** Under IFRS, investor positions are categorised on the basis of the intention with which the securities were acquired and the type of securities according to IFRS 9 (FVTPL, Amortised Cost and FVOCI). For a detailed explanation, please refer to the notes to the IFRS Group financial statements (Notes to the balance sheet, from page 189 onwards), which also explains the related valuation procedures. If the securitisation exposures are traded on liquid markets with observable pricing, they are valued on the basis of independent market prices. If direct measurement at market prices is not possible, the value of the securitisation exposure is determined using prices from external providers. In some cases the value of the securitisation exposure is determined with the help of valuation models. This involves the application of a discounted cash flow approach, with the cash flows and other relevant parameters being based on data observable on the market. Moreover, the approach is calibrated with market data for application to similar securitisation structures. In many cases the prices estimated by external providers are used. There were no significant changes in the methods used to value securitisation positions in the period under review.

Quantitative information on securitisations

Securitisation positions in the banking book The following information relates to transactions for which risk-weighted exposures are determined in accordance with Articles 242–270 CRR. This also includes the Commerzbank Group's own securitisation transactions for which capital relief is available and made use of for regulatory purposes.

The total volume of all retained or acquired securitisation exposures (on- and off-balance-sheet) was €17.2bn as at the reporting date. This amount corresponds to the IRBA and SACR exposures after deducting eligible collateral.

A breakdown of retained or acquired securitisation exposures by exposure type and the regulatory role assumed by Commerzbank is given in the following table.

SEC2: Retained or acquired securitisation exposures in the banking book by type of exposure

	Originator		Investor		Sponsor	
€m	IRBA	SACR	IRBA	SACR	IRBA	SACR
Receivables[1]	5,442	0	0	0	1,414	0
Securities[2]	19	0	4,039	3,641	138	0
Other positions on-balance	0	0	0	0	0	0
Liquidity facilities	0	0	0	0	2,451	0
Derivatives[3]	0	0	2	68	4	0
Other positions off-balance[4]	0	0	0	0	16	0
Total 2018	**5,461**	**0**	**4,041**	**3,709**	**4,023**	**0**
Total 2017	7,098	1	3,656	3,854	3,925	193

[1] For example, drawdowns on liquidity facilities, cash loans, on-balance positions from synthetic transactions etc.
[2] ABS, RMBS, CMBS etc.
[3] Counterparty risk from market value hedges (interest rate and currency risk).
[4] Garantees etc.

The table below provides a breakdown of the securitisation exposures shown above by type of underlying assets.

SEC3: Retained or acquired securitisation exposures in the banking book by type of asset

	Originator		Investor		Sponsor	
€m	IRBA	SACR	IRBA	SACR	IRBA	SACR
Loans to companies/SMEs	5,461	0	3,710	23	173	0
Commercial real estate	0	0	85	0	0	0
Residential real estate	0	0	4	158	0	0
Consumer loans	0	0	241	3,459	255	0
Securitised positions	0	0	1	7	0	0
Leasing receivables	0	0	0	0	1,384	0
Trade receivables	0	0	0	0	2,212	0
Other	0	0	0	63	0	0
Total 2018	**5,461**	**0**	**4,041**	**3,709**	**4,023**	**0**
Total 2017	7,098	1	3,656	3,854	3,925	193

Based on the country of the securitised claim, the securitisation exposures originate predominantly from Germany at 58% (2017: 64%), the USA 29% (2017: 21%) and France 4% (2017: 1%).

The next table provides a breakdown of acquired or retained securitisation exposures by risk weighting bands. Risk weightings are ascertained by applying the risk approach applicable to each securitisation exposure as per Article 259 CRR. If a securitisation exposure has an external rating of B+ or worse, the exposure is deducted from CET1 capital. The capital requirements are determined by the exposure and its risk weighting after taking account of any impairments.

SEC4: Retained or acquired securitisation exposures in the banking book by risk weighting band

IRBA	RBA		IAA		SFA	
Risk weighting band €m	Position value	Capital requirement	Position value	Capital requirement	Position value	Capital requirement
≤ 10%	3,985	24	1,834	13	5,446	29
> 10% ≤ 20%	41	0	1,243	19	0	0
> 20% ≤ 50%	0	0	549	12	0	0
> 50% ≤ 100%	0	0	255	13	0	0
> 100% ≤ 650%	0	0	0	0	13	4
> 650% < 1,250%	0	0	0	0	11	9
Total 2018	**4,026**	**24**	**3,881**	**56**	**5,471**	**41**
Total 2017	3,620	22	3,777	57	7,130	58

SACR	RBA		IAA		LTA	
Risk weighting band €m	Position value	Capital requirement	Position value	Capital requirement	Position value	Capital requirement
≤ 10%	0	0	0	0	0	0
> 10% ≤ 20%	3,407	55	0	0	0	0
> 20% ≤ 50%	57	2	0	0	0	0
> 50% ≤ 100%	101	8	0	0	0	0
> 100% ≤ 650%	6	2	0	0	22	2
> 650% < 1,250%	0	0	0	0	42	5
Total 2018	**3,570**	**66**	**0**	**0**	**64**	**7**
Total 2017	3,704	72	192	3	65	8

As at 31 December 2018 the value of the securitisation exposures deducted from equity capital was €195m (2017: €239m). After taking account of impairments, the capital deduction amounted to €199m (2017: €195m).

As at 31 December 2018 the total exposure value of the retained or acquired resecuritisation exposures in the banking book came to €15m and the resultant capital requirement also to €15m.

The capital requirement values do not consider hedge positions or insurance; all positions were shown in the IRBA.

The table below shows the outstanding volumes of Commerzbank’s securitisation transactions. These were originator transactions with recognised regulatory risk transfer or primary ABCP-funded sponsor transactions.

SEC5: Securitisation assets outstanding

	Originator Traditional		Originator Synthetic		Sponsor[1]	
€m	2018	2017	2018	2017	2018	2017
Loans to companies/SMEs	71	71	5,127	6,326	215	187
Consumer loans	0	0	0	0	0	189
Securitised positions	0	0	0	0	1	1
Leasing receivables	0	0	0	0	1,780	1,396
Trade receivables	0	0	0	0	2,022	1,681
Commercial real estate	0	0	0	0	0	0
Residential real estate	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	**71**	**71**	**5,127**	**6,326**	**4,018**	**3,453**

[1] Mainly ABCP.

On the reporting date, the securitised portfolios included non-performing or past due loans as shown below:

SEC6: Impaired / past-due assets securitised

	Non-performing loans		Past due loans	
€m	2018	2017	2018	2017
Loans to companies/SMEs	45	51	19	6
Commercial real estate	0	0	0	0
Residential real estate	0	0	0	0
Total	**45**	**51**	**19**	**6**

During the period under review, no portfolio losses occurred under the Commerzbank originator transactions. We have taken the information on portfolio losses and on impaired and past due claims from the investor reports for the respective underlying transactions.

Securitisation transactions in the trading book The information in this section relates to securitisation exposures in the trading book (excluding the correlation trading portfolio) for which risk-weighted exposure values are determined in accordance with Article 337 CRR. This comprises securitisation exposures where Commerzbank acts as sponsor, originator or investor.

The total net exposure of all retained or acquired securitisation positions was below €1m at the reporting date, including credit derivative hedges according to article 337 CRR. There are no further off-balance-sheet hedge positions.

The trading book's total retained or acquired securitisation position with a total net exposure below €1m is subject to the SACR as at 31 December 2018 – as in the previous year – and relates to the type of asset "Securitisation position".

Based on the country of the securitised claim most of these securitisation exposures originate from the Germany.

At year-end 2018 (as at year-end-2017) there were no retained or acquired resecuritisation exposures in the trading book, hence no report by risk weighting band is provided.

As at the end of the reporting period, there were no trading book securitisation exposures that were not deducted from CET1. As at 31 December 2018 the value of the securitisation exposures to be deducted from equity capital (including resecuritisations) as well as the capital requirement was below €1m (2017: €2m).

D. Market risk (MR)

Market risk is the risk of potential financial losses due to changes in market prices (interest rates, commodities, credit spreads, exchange rates and equity prices) or in parameters that affect prices such as volatilities and correlations. Losses may impact profit or loss directly, e.g. in the case of trading book positions. However, for banking book positions they are generally reflected in the revaluation reserve or in hidden liabilities/reserves.

Risk management

Strategy and organisation

Commerzbank's market risk strategy is derived from its Group Risik Strategy and the business strategies of the individual segments. It sets targets for market risk management in relation to Commerzbank's main business activities. The core market risk management tasks are the identification of all material market risks and drivers of market risk for the Group and the independent measurement and evaluation of these. The results and estimates serve as the basis for risk/return-oriented management.

The Board of Managing Directors of Commerzbank is responsible for ensuring the effective management of market risk throughout the Commerzbank Group. Specific levels of authority and responsibility in relation to market risk management have been assigned to the appropriate market risk committees.

Various market risk committees have been established within the Bank. In these, segment representatives, along with representatives from the risk function and finance area, discuss current risk positioning issues and decide on appropriate action. Chaired by the risk function, the Group Market Risk Committee, which meets monthly, deals with the Commerzbank Group's market risk position. Discussions centre on the monthly market risk report, which is also presented to the Board of Managing Directors for their consideration. The report summarises the latest developments on financial markets, the Bank's positioning and related risk ratios. The Segment Market Risk Committee focuses on the Corporate Clients segment and the Group Treasury division. This committee also manages market risks arising from non-core activities (Asset & Capital Recovery).

The risk management process involves the identification, measurement, management and monitoring of risks and reporting on them. It is the responsibility in functional terms of market risk management, which is independent of trading activities. Central market risk management is complemented by decentralised market risk management units at segment level and for regional units and subsidiaries. The close integration of central and local risk management with the business units means that the risk management process starts in the trading areas themselves. The trading units are responsible in particular for the active management of market risk positions, e.g. reduction measures or hedging.

Risk management

Commerzbank uses a wide range of quantitative and qualitative tools to manage and monitor market risk. Quantitative limits for sensitivities, value at risk (VaR) figures, stress tests, scenario analyses and ratios on economic capital limit the market risk. Our comprehensive rulebook, in the form of market risk policies and guidelines as well as restrictions on portfolio structure, new products, maturities and minimum ratings, establishes the qualitative framework for market risk management. The market risk strategy lays down the weighting of figures in each segment by reference to their relevance. Thereby allowance is made for the varying impact of the parameters for the management of the segments in line with the business strategy.

Market risk is managed internally at Group level, segment level and in the segment's reporting units. A comprehensive internal limit system broken down to portfolio level is implemented and forms a core part of internal market risk management.

The quantitative and qualitative factors limiting market price risk are determined by the market risk committees by reference to the Group's management of economic capital. The utilisation of these limits, together with the relevant net income figures, is reported daily to the Board of Managing Directors and the responsible heads of the Group divisions. Based on qualitative analyses and quantitative ratios, the market risk function identifies potential future risks, anticipates potential financial losses in collaboration with the finance function, and draws up proposals for further action, which are discussed with the market units. Voting on the proposed measures or exposures takes place in the above-mentioned market risk committees and is subsequently submitted to the Board of Managing Directors for approval.

Risk concentrations are restricted directly with specific limits or are indirectly avoided, for example using stress test limits. In addition, the combination of various conventional risk measures (e.g. VaR, sensitivities) ensures the appropriate management of concentration risks. Furthermore, risk drivers are analysed on a regular basis in order to identify concentrations. The risk management of existing concentrations is also reviewed using situation-driven analyses and, where necessary, supplemented by targeted measures such as limits.

Any limits that are breached are handled in a separate escalation procedure. After a limit breach has been identified, the front office and risk units design adequate countermeasures. If the limit breach cannot be remedied within a reasonable period, it will be escalated by the market risk function to the next hierarchical level.

Regulatory risk measures that are not included in economic risk-bearing capacity are limited and managed separately. These include, for example, stressed VaR and incremental risk charge.

Tradability and measurement of financial instruments

The criteria applicable within the Bank for the allocation of transactions to the trading book or banking book are set as part of a Group-wide policy which implements the regulatory requirements for the allocation of transactions to the trading book with regard to the bank-specific circumstances, particularly also with regard to organisation and the focus of business policy.

Commerzbank has various control processes in place to identify illiquid markets and trading restrictions, which provide indications to determine the procedures to adopt in such cases. In addition to this, the ability to hedge trading book positions and the assessment of the reliability of measuring these trading book positions are subject to regular reviews.

IFRS 13, which has had to be applied since the financial year 2013, standardises the rules for measuring fair value. Under IFRS 13, the fair value of an asset is the amount for which it could be sold between knowledgeable, willing, independent parties in an arm's length transaction. The fair value therefore represents a realisable price.

The fair value of a liability is defined as the price at which the debt could be transferred to a third party as part of an orderly transaction. Furthermore, for the valuation of a debt one's own default risk has to be considered.

The most suitable measure of fair value is the quoted price for an identical instrument in an active market (fair value hierarchy level I). In cases where no quoted prices are available, valuation is based on quoted prices for similar instruments in active markets. In all other cases, fair value is derived using an appropriate valuation model where the data inputs are obtained, as far as possible, from verifiable market sources (fair value hierarchy level II).

Most valuation methods are based on data from verifiable market sources. However, some valuation models use inputs for which sufficient verifiable current market data is not available, and which therefore inherently include a greater level of expert or management judgement. These unobservable inputs may include data that is extrapolated or interpolated, or may be derived by approximation to correlated or historical data. However, to a maximum extent, these inputs are market or third-party inputs and rely as little as possible on expert estimates or company-specific inputs (fair value hierarchy level III).

Valuation models must be consistent with accepted economic methodologies for pricing financial instruments. They must incorporate all factors that market participants would consider appropriate in setting a price. In the Commerzbank Group, standards have been established in the form of internal controls and procedures for the independent verification and validation of all fair values including the creation of a valuation reserve. These controls and procedures are carried out by various units within the independent finance and risk functions, with a central supervisory function being exercised by the Independent Price Verification (IPV) Group within the finance function. The models, inputs and resulting fair values are reviewed regularly by senior management, the finance and the risk function.

The fair value itself is determined in a two-step process. As a first step, the individual fair value components are calculated in accordance with the relevant rules; the second step involves combining the components on a monthly basis in a consolidated fair value report for reporting at Group level.

The independent price verification (IPV) process ensures the correctness of the prices and parameters used in the fair value calculation as a central, independent process for determining and verifying the fair value. The IPV process is based on a risk-oriented approach which takes into account internal factors such as changes in business strategy, the expansion or downsizing of business activities as well as external factors such as developments in markets, products and valuation models. If a price is directly observable, e.g. the settlement price of a future or the stock market price of a share, the products are valued at the bid or offer side, depending on whether they are a long or a short position. However, if a valuation model for determining fair value is applied, the respective input parameters at mid-market are used, e.g. interest rates and implied volatilities to value an interest rate option. This results in the positions affected being overvalued because their liquidation or hedging in the market would always be realised at a bid or offer price. Accordingly, "bid-offer reserves" - totalling ½ of the bid-offer spread in relation to the associated position - must be taken into account as liquidation or hedge costs for all positions valued at mid-market.

In the event of illiquid products or input parameters the availability of independent market data sources may be restricted. Where sufficient information is available for a solid independent estimate made by experts, a parameter uncertainty reserve is set up. Such estimates are usually based on comparable and available market data (mapping), so the corresponding reserve can be calculated on the basis of the standard deviation of this market data. However, if the applied valuation models use input parameters for which there is no market data or insufficient verifiable market data (see Level III above), a "Day-1 reserve" is set up on the day the transaction is executed. To this end, the profit or loss calculated by the valuation model on the first day of trading (Day1) is set aside and recognised on a pro-rata basis over the term of the transaction or the period during which the relevant market parameters are expected to be unobservable.

Should valuation models show theoretical deficits or be subject to certain restrictions in their practical application, it is necessary to set up model reserves that reflect these uncertainties. Here, a distinction is made between generic model reserves, which relate to all transactions measured using a specific model, and specific model reserves, which affect only individual transactions or particular model combinations. These reserves are usually estimated using a revaluation with alternative models.

In addition, for some years valuation adjustments (summarised under the term xVA) for OTC derivatives have been taken into account as a result of the financial crisis. These valuation adjustments include the risk and funding profiles of counterparties and of the bank itself in the valuation. Thus the credit valuation adjustment (CVA) describes the valuation adjustment of OTC derivatives for the default risk of the counterparty while the debit valuation adjustment (DVA) depicts the adjustment for own default risk. The funding valuation adjustment (FVA) for its part offsets differences in funding costs on account of the incomplete collateralisation of derivative transactions.

Market risk model

Value at Risk

A standardised value at risk model incorporating all positions is used for the internal management of market risk. VaR quantifies the potential loss from financial instruments due to changed market conditions over a predefined time horizon and with a specific probability.

Our VaR market risk model is based on a historical simulation with a one-year interval of historical market data. The historical simulation determines the profit and loss distribution of the current portfolio by means of revaluation using historical changes in market prices and volatility. This is done on the basis of independent market data which is quality-assured on a daily basis and fed into a central market database at a standard defined time. Market data is provided for all relevant positions in the asset classes interest rates, credit spreads, equities, foreign currencies and commodities. This market data takes the form of prices quoted directly on the market or market data such as yield and credit spread curves derived using internal methods. A proxy concept is used if no market data is available for individual exposures. In this case, prices are derived from those for comparable instruments.

For internal management purposes, a confidence level of 97.5% and a holding period of one day are assumed. The value at risk concept makes it possible to compare risks over a variety of business areas. It enables many positions to be aggregated, taking account of correlations between different assets. This ensures a consolidated view of the market risk at all times. A comprehensive internal limit system broken down to portfolio level is implemented and represents an important part of internal market risk management.

The VaR market risk model described above is also used to calculate regulatory required capital. This regulatory capital backing is required for trading book risks and for currency and commodity price risks in the banking book. A confidence level of 99% and a ten-day holding period are used for the regulatory capital adequacy requirement. These assumptions meet the requirements of the Basel Committee and other international standards on the management of market risk. For certain evaluations, such as backtesting, the VaR is also calculated on the basis of a one-day holding period.

Stress test

As the VaR concept gives a prediction of potential losses on the assumption of normal market conditions, it is supplemented by the calculation of stress tests. These stress tests measure the risk to which Commerzbank is exposed, based on unlikely but still plausible events. These events may be simulated using extreme movements on various financial markets. The key scenarios relate to major changes in credit spreads, interest rates and yield curves, exchange rates, share prices and commodities prices. Events simulated in stress tests include all stock prices falling by 15%, a parallel shift in the yield curve or changes to the curve's steepness.

Extensive Group-wide stress tests and scenario analyses are carried out as part of risk monitoring. The Bank-wide stress test calculation is based on a combination of short-term stress test scenarios and scenarios based on macro-economic variables. The stress test framework is completed by portfolio-specific stress tests and ad-hoc scenario analyses.

Stress tests are intended to simulate the impact of crises and extreme market conditions on the Bank's overall market risk position. The impact on the respective components of capital and the income statement is also quantified in these tests.

In order to manage and monitor risks, short-term scenarios are calculated daily, compared against fixed limits and reported to the Board of Managing Directors. The longer-term scenarios are calculated on a monthly basis and discussed in the respective committees.

Model validation

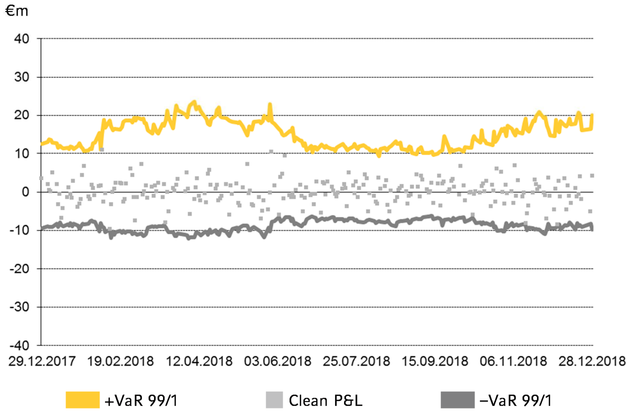
The reliability of the internal model (historic simulation) is monitored in various ways, including by backtesting on a daily basis. The VaR calculated is set against actually occurring profits and losses. The VaR used in backtesting is based on the complete historic simulation and therefore represents all internal models used in the market risk VaR calculation of capital adequacy requirements at Group level. The process draws a distinction between "clean P&L" and "dirty P&L" backtesting. In clean P&L backtesting, exactly the same positions in the income statement are used as were used for calculating the VaR. This means that the profits and losses result only from changes in market prices (hypothetical changes in the portfolio value). In dirty P&L backtesting, by contrast, profits and losses from newly concluded and expired transactions from the day under consideration are also included (actual profits and losses induced by portfolio value changes). Profits and losses from valuation adjustments and model reserves are factored into dirty and clean P&L according to the regulatory requirements.

If the actual loss exceeds the VaR, it is described as a negative backtesting outlier. Analysing the results of backtesting provides an informative basis for checking parameters and for improving the market risk model. In 2018, we saw no negative clean P&L outlier and no negative dirty P&L outliers.

As such, the results confirm the quality of the VaR model. Backtesting is also used by the supervisory authorities for evaluating internal risk models. Negative outliers are classified by means of a traffic-light system laid down by the supervisory authorities. All negative backtesting outliers at Group level (from both clean P&L and dirty P&L) must be reported to the supervisory authorities, citing their extent and cause.

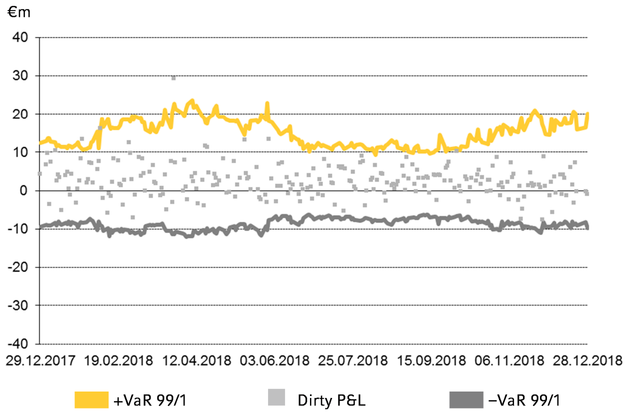
EU MR4: Comparison of VaR estimates with gains/losses (clean)

Clean P&L backtesting results



EU MR4: Comparison of VaR estimates with gains/losses (dirty)

Dirty P&L backtesting results



The individual components of the internal model are regularly validated for their appropriateness for risk measurement. These include the underlying model assumptions and parameters and the proxies used. Validation analyses are planned and carried out based on the validation concept. The scope and frequency of the validations are defined in the validation concept by means of a materiality and risk-oriented prioritisation. The validation planning and progress is regularly presented to the Validation Committee, which discusses and approves the validation results.

The validation results are also reported to the Group Market Risk Committee on a quarterly basis. The identification and elimination of model weaknesses are of particular importance.

Quantitative information on market risks

Pursuant to Article 92 (3) b) and c) CRR, adequate capital must be set aside for market risk positions. Commerzbank uses an internal market risk model to calculate the regulatory capital requirement. This affects both the equity price and interest rate-related risk positions in the trading book as well as the currency positions and commodity positions. The standardised approaches are applied for smaller units in the Commerzbank Group in accordance with the partial use option.

EU MR1: Market risk under the standardised approach

		a	b
	€m	**RWAs**	**Capital requirements**
	Outright products		
1	Interest rate risk (general and specific)	343	27
2	Equity risk (general and specific)	0	0
3	Foreign exchange risk	1,187	95
4	Commodity risk	0	0
	Options		
5	Simplified approach	0	0
6	Delta-plus method	2	0
7	Scenario approach	0	0
8	Securitisations (specific risk)	0	0
9	Collective investment undertakings	0	0
10	**Total**	**1,533**	**123**

Development of market risk assets in the standard approach

The standard approach is essentially used to include the market risk positions of investments/subsidiaries in the calculation of capital requirements. At 31 December 2018, the standard approach accounted for 17 % of all market risk assets. The risk-weighted assets for market risk positions in the standard approach increased by €492m to €1,533m in the second half-year of 2018. The main reason for this was higher foreign exchange risk in the Corporate Clients segment. The dominant risk classes are foreign exchange and interest rate risks.

Market risk in the internal model approach

At 31 December 2018, the internal model approach accounted for 83% of all market risk assets. The risk-weighted assets for market risk positions in the internal model increased slightly in the fourth quarter of 2018 by €75m to €7,410m due to increased risk-weighted assets from VaR. The increase in the risk level was caused by exposure changes in Business Segment Corporate Clients.

EU MR2-A: MR under the Internal Model Approach (IMA)

		a	b
	€m	**RWAs**	**Capital requirements**
1	**VaR (higher of values a) and b))**	**1,268**	**101**
a)	Previous day's VaR (Article 365(1) of the CRR (VaRt-1))		31
b)	Average of the daily VaR (Article 365(1)) of the CRR on each of the preceding 60 business days (VaRavg) x multiplication factor (mc) in accordance with Article 366 of the CRR		101
2	**sVaR (higher of values a) and b))**	**5,791**	**463**
a)	Latest SVaR (Article 365(2) of the CRR (SVaRt-1))		121
b)	Average of the SVaR (Article 365(2) of the CRR) during the preceding 60 business days (SVaRavg) x multiplication factor (ms) (Article 366 of the CRR)		463
3	**IRC (higher of values a) and b))**	**352**	**28**
a)	Most recent IRC value (incremental default and migration risks calculated in accordance with Article 370 and Article 371 of the CRR)		19
b)	Average of the IRC number over the preceding 12 weeks		28
4	**Comprehensive risk measure (higher of values a), b) and c))**	**0**	**0**
a)	Most recent risk number for the correlation trading portfolio (Article 377 of the CRR)		0
b)	Average of the risk number for the correlation trading portfolio over the preceding 12 weeks		0
c)	8% of the own funds requirement in the standardised approach on the most recent risk number for the correlation trading portfolio (Article 338(4) of the CRR)		0
5	**Others**	**0**	**0**
6	**Total**	**7,410**	**593**

EU MR2-B: RWA flow statements of market risk exposures under the Internal Model Approach (IMA)

		a	b	c	d	e	f	g
	€m	**VaR**	**SVaR**	**IRC**	**Comprehensive risk measure**	**Others**	**Total RWAs**	**Total capital requirement**
1	**RWA at previous quarter end**	**1,080**	**5,843**	**412**	**0**	**0**	**7,335**	**587**
1a	Regulatory adjustment	0	0	0	0	0	0	0
1b	RWA at previous quarter end (end of day)	1,080	5,843	412	0	0	7,335	587
2	Movement in risk levels	188	–53	–60	0	0	75	6
3	Model updates/changes	0	0	0	0	0	0	0
4	Methodology and policy	0	0	0	0	0	0	0
5	Acquisitions and disposals	0	0	0	0	0	0	0
6	Foreign exchange movements[1]	0	0	0	0	0	0	0
7	Others	0	0	0	0	0	0	0
8a	RWA at the end of the reporting period (end of day)	1,268	5,791	352	0	0	7,410	593
8b	Regulatory adjustment	0	0	0	0	0	0	0
8	**RWA at the end of the reporting period**	**1,268**	**5,791**	**352**	**0**	**0**	**7,410**	**593**

[1] Changes of RWA which are due to foreign exchange movements are reported under „Movement in risk levels".

Market risk in the trading book

Below, we show how the regulatory market risk ratios of the trading book portfolio developed. Most of Commerzbank's trading book positions derive from the Corporate Clients segment and Treasury division.

The value at risk (10 days 99%) remained stable at a low level in the course of the year with €31m as at 31 December 2018.

The market risk profile is diversified across all asset classes. The dominant asset classes are interest rate, foreign exchange and equity price risks. To a lesser extent, value at risk is also affected by credit spread, commodity and inflation risks.

Further risk ratios are calculated for regulatory capital adequacy. This includes the calculation of stressed VaR. Stressed VaR is calculated using the internal model on the basis of the VaR method described above. The main difference lies in the market data used to value the assets. Stressed VaR measures the risk in the present position in the trading book by reference to market movements from a specified crisis period in the past. The crisis observation period used for this is checked regularly through model validation and approval processes and adjusted where necessary. The crisis observation period remained the same in the course of the year.

In addition, the incremental risk charge and the equity event VaR figures quantify the risk of deterioration in creditworthiness and event risks in trading book positions. Equity event VaR is conceptually part of the historical simulation taking into account empirical equity events over long observation periods. It is a component in the regulatory VaR calculation and included in the values of the following table EU MR3. Commerzbank does not have an internal model for correlation trading activities.

The incremental risk charge is based on the credit VaR model with historical data for rating migration and default probabilities and for recovery factors. The model shows current gains and losses on positions in the event of rating changes. In addition, in calculating the incremental risk charge, assumptions are made regarding liquidity (average regrouping/liquidity horizon). These liquidity horizons are set on a portfolio-specific basis, taking into account market structure and activity and concentrations of positions.

Stressed VaR (10 days 99%) increased by €14m year-on-year to €112m, mainly as a result of exposure changes in the Corporate Clients segment. The incremental risk charge declined by €24m to €19m. This was primarily owing to exposure changes in the Corporate Clients segment.

EU MR3: IMA values for trading portfolios

	€m	a
	VaR (10 day 99%)	
1	Maximum value	38
2	Average value	27
3	Minimum value	20
4	Period end	31
	sVaR (10 day 99%)	
5	Maximum value	148
6	Average value	108
7	Minimum value	84
8	Period end	112
	IRC (99.9%)	
9	Maximum value	52
10	Average value	38
11	Minimum value	19
12	Period end	19
	Comprehensive risk capital charge (99.9%)	
13	Maximum value	-
14	Average value	-
15	Minimum value	-
16	Period end	-

addMR1: Incremental Risk Charge by sub-portfolio

Sub-portfolio	**IRC**[1] €m	**Average regrouping horizon** | months
Corporates & Markets	19	6
Treasury	0.4	12

[1] Excluding diversification effects between sub-portfolios.

Market liquidity risk

In taking steps to ensure economic capital adequacy, Commerzbank also considers market liquidity risk. This is the risk of the Bank not being able to liquidate or hedge risky positions in a timely manner, to the desired extent and on acceptable terms as a result of insufficient liquidity in the market.

The first step is to create a realistic downsizing profile for each portfolio on the basis of its product and risk strategies and an assessment of the market. This enables portfolios to be classified in terms of their convertibility into cash using a "market liquidity factor". The market liquidity factor takes into account the heightened volatility of portfolio value resulting from the extended holding period for risk positions in line with the portfolio's downsizing profile. The market risk of every portfolio is then evaluated based on a one-year view and weighted with the market liquidity factor.

As at the end of 2018, Commerzbank has earmarked €0.1bn in economic capital to cover market liquidity risk in the trading and banking book. Asset-backed securities and structured products in particular have a higher market liquidity risk.

addMR2: Market liquidity VaR

Capital requirement | €m	**2018**	**2017**
Minimum	99	136
Average	117	178
Maximum	131	239
Year-end figure	126	136

Interest rate risk in the banking book

Interest rate risk is one of the most significant financial risks posed by banking operations. This includes in particular the risk of value adjustments as a result of interest rate fluctuations over time. The maturity of interest rate positions and their refinancing structure are fundamental factors in the management of interest rate risks. In commercial business, the modelling of interest rate risk includes assumptions on early repayments and on investor behaviour when deposits are open-ended. The risk of a flattening or steepening in the yield curve is also covered. Interest rate risks may also arise if positions are closed as a result of hedging transactions with a different pricing type to the underlying transaction (basis risks). Interest rate risks relate to Commerzbank's banking book and trading book. The combined position of both books results in Commerzbank's overall interest rate risk.

Strategy and organisation

The interest rate risk in the Commerzbank Group's banking book primarily results from commercial business. Interest rate risks arise here if interest rate positions in customer business are not hedged or are only partially hedged. Interest rate risks also arise from the investment models used by the central ALCO (Asset Liability Committee), which comprise in particular the investment and/or refinancing of products without contractually fixed interest rates, e.g. for equity capital, savings and sight deposits.

In the Commerzbank Group, interest rate risk in the banking book is the responsibility of Group Treasury within the scope of the business strategy. In addition to the positions of the central Group Treasury division, the treasury activities of branches and all subsidiaries are also taken into consideration.

Treasury's main tasks include the management of the balance sheet structure and of liquidity risks. The aim is to generate a positive interest margin from interest income and refinancing expenses. This gives rise to interest rate risks if positions are not refinanced with matching maturities and matching currencies.

Management

Commerzbank jointly manages interest rate risk from both the trading and banking book, as well as managing this risk separately for the trading book and banking book. This is done strategically by means of risk policies and operationally by means of appropriate limit systems. The risks are consolidated in central risk management. Central risk management is supplemented by a risk management unit for Treasury within the market risk function.

Interest rate risks in the banking book are managed in line with the business strategy by means of maturity- and currency-congruent refinancing and the use of interest rate derivatives. For example, interest rate swaps with sufficient market liquidity enable a prompt response to management measures. However, some products without fixed maturities, such as sight and savings deposits or equity capital, are available to the Bank in the long term. Here the Bank uses appropriate models to manage interest rate risks and stabilise earnings performance. Our models are regularly monitored.

Quantitative information on interest rate risks in the banking book

The measurement of interest rate risk is completely integrated into the Bank's daily measurement and monitoring of risk. As with the measurement of trading book risks, risks in the banking book are also quantified using the value at risk method. Stress tests and scenario analyses are also calculated on a daily and monthly basis. The stress test calculations as mentioned above are used for this purpose. This standardised procedure is intended to ensure transparency of interest rate risks in both the trading and banking book.

A further control variable for interest rate risks in the banking book is interest rate sensitivities. These indicate how interest income varies following a change in interest rates, for example of one basis point (bp). Interest rate sensitivities are also monitored on a daily and monthly basis. This monitoring takes place at both portfolio and segment level as well as for the Commerzbank Group. For management purposes, interest rate sensitivities are limited to the various maturity bands at both Group and segment level. The main focus is on interest rate sensitivities relating to long maturity periods.

The impact of an interest rate shock on the economic value of the Group's banking books is simulated monthly in compliance with regulatory requirements. In accordance with the Banking Directive, the Federal Financial Supervisory Authority (BaFin) and the European Central Bank (ECB) have prescribed two uniform, sudden and unexpected changes in interest rates (+/–200 basis points) to be used by all banks, which have to report on the results of this stress test every quarter.

On this basis, the interest rate shift of +200 basis points would give a potential loss of €1,651m, and the shift of –200 basis points a potential gain of €230m as at 31 December 2018. Commerzbank does therefore not need to be classified as a bank with higher interest rate risk as the negative changes in present value account for less than 20% of regulatory capital.

addMR3: Interest rate risk in the banking book by currency

€m	2018		2017	
Interest rate shock	**–200bp**	**+200bp**	**–200bp**	**+200bp**
EUR	–206	–1,390	92	–1,587
USD	114	–112	–39	24
GBP	226	–83	361	13
JPY	1	5	2	5
CHF	0	5	1	9
Others	95	–76	41	–42
Total	**230**	**–1,651**	**457**	**–1,578**

The changes from the prior year were mainly the result of changes in the GBP and EUR interest rate positions in Business Segment Asset & Capital Recovery (ACR) and in the Group Treasury area, which in turn were partly due to market movements. The changes in the "Other" currency block were primarily the result of a change in the interest exposure at the Polish subsidiary mBank.

E. Liquidity risk (LR)

We define liquidity risk in a narrower sense as the risk that Commerzbank will be unable to meet its payment obligations on a day-to-day basis. In a broader sense, liquidity risk describes the risk that future payments cannot be funded for the full amount, in the required currency or at standard market conditions, as and when they are due.

Risk management

Strategy and organisation

The Board of Managing Directors adopts the business strategy and the Bank's risk tolerance, which is associated with it. Liquidity risk tolerance is then operationalised by defining the liquidity reserve period and the limit framework. In order to ensure an appropriate liquidity risk management process, the Board of Managing Directors delegates certain competences and responsibilities in connection with the Group-wide liquidity risk strategy to the risk and treasury functions.

The central Asset Liability Committee (ALCO) is responsible for limiting, analysing and monitoring liquidity risk and for strategic liquidity positioning. ALCO is supported by various sub-committees in this.

Risk management

Commerzbank uses a wide range of tools to manage and monitor liquidity risks on the basis of its internal liquidity risk model. The stress scenario within the Bank that underlies the model and is relevant for management purposes allows for the impact of both a bank-specific stress event and a broader market crisis. Binding regulatory requirements are an integral component of the management mechanism.

Group Treasury is responsible for the Group's liquidity management operations. Group Treasury is represented in all major locations of the Group in Germany and abroad and has reporting lines into all subsidiaries.

Commerzbank manages its global liquidity centrally using cash pooling. This approach ensures liquidity resources are used efficiently and that this occurs across all time zones, as Group Treasury units are located in Frankfurt, London, New York and Singapore.

Additional information on this subject can be found in the section "Funding and liquidity of the Commerzbank Group" in the Group Management Report. Liquidity risk is monitored on the basis of the Bank's own liquidity risk model by the independent risk function.

The Bank has established early warning indicators for the purpose of managing liquidity risk. These ensure that appropriate steps can be taken in good time to secure long-term financial solidity.

Risk concentrations can lead to increased outflows of liquidity, particularly in a stress situation, and thus to increased liquidity risk. They can, for example, occur with regard to maturities, large individual creditors or currencies. By means of ongoing monitoring and reporting, emerging risk concentrations in funding can be recognised in a timely manner and mitigated through suitable measures.

This is also applicable for payment obligations in foreign currencies. In addition, the Bank also mitigates a concentration by continuously using broadly diversified sources of funding, particularly diverse customer deposits and capital market instruments.

Commerzbank also ensures that it monitors foreign exchange risks and fulfils the currency matching requirements for highly liquid assets and net liquidity outflows.

In the event of a liquidity crisis, the emergency plan provides for various measures for different types of crisis that can be launched by the central ALCO. The emergency plan forms an integral part of Commerzbank's recovery plan and is updated at least once a year, whereas the individual liquidity emergency measures are checked regularly during the year for plausibility. The emergency plan also defines a clear allocation of responsibilities for the processes to be followed in emergency situations and gives details of any action that may need to be taken.

Information on the encumbrance of assets pursuant to Article 443 CRR can be found in the Annual Report 2018, pages 330-332.

Liquidity risk model

A key component of liquidity risk management is the daily calculation of the liquidity gap profile. The liquidity gap profile shows the deterministic or stochastic inflows and outflows expected in the future on a given reporting date and across all portfolios. This forms the basis for calculating liquidity requirements or excess liquidity per maturity band. This also includes modelling the proportion of customer deposits that will be permanently available, known as the core deposit base.

The liquidity gap profile is also used to set the issuance strategy of the Commerzbank Group, which is operationalised by the Group Treasury division. The Group Finance division is responsible for calculating and allocating liquidity costs on the basis of the liquidity gap profile, which are then incorporated in the management of the segments' business activities.

Based on the methodology of the liquidity gap profile, management mechanisms such as recovery and early warning indicators are limited and monitored accordingly. The liquidity gap profile is limited in all maturity bands. The Group limits are broken down into individual Group units and currencies. The internal liquidity risk model is complemented by the regular analysis of additional adverse, reverse and historic stress scenarios.

Quantification and stress testing

Commerzbank uses a wide range of tools to manage and monitor liquidity risks on the basis of its internal liquidity risk model. In addition to internal economic considerations, liquidity risk modelling also factors in the binding regulatory requirements under the Capital Requirements Regulation (CRR) and the requirements of the Minimum Requirements for Risk Management (MaRisk). Commerzbank incorporates this within its liquidity risk framework, thereby quantifying the liquidity risk appetite established by the full Board of Managing Directors.

The stress scenarios within the Bank that underlie the model and are relevant for management purposes allow for the impact of both a bank-specific stress event and a broader market crisis. The Commerzbank-specific idiosyncratic scenario simulates a stress situation arising from a rating downgrade of two notches, whereas the market-wide scenario is derived from experience of the subprime crisis and simulates an external, market-wide shock. The main liquidity risk drivers of both scenarios are a markedly increased outflow of short-term customer deposits, above-average drawdown of credit lines, extensions of lending business regarded as commercially necessary, the need to provide additional collateral for secured transactions and the application of higher risk discounts to the liquidation values of assets.

As a complement to the individual scenarios, the Bank also simulates the impact on the liquidity gap profile (net liquidity position) of a scenario that combines idiosyncratic and market-specific effects. The liquidity gap profile is shown for the whole of the modelling horizon across the full spectrum of maturities and follows a multi-level concept. This allows for a nuanced presentation of deterministic and modelled cash flows in existing business on the one hand and the inclusion of prolongations on the other.

The table below shows the liquidity gap profile after application of the respective stress scenarios for periods of one and three months. Significantly more liquidity flows out in a combined scenario compared with the individual scenarios. As at end-2018, in the one-month and three-month periods, the combined stress scenario leaves net liquidity of €11.0bn and €11.7bn respectively.

addLR1: Liquidity gap profile in the stress scenarios

Net liquidity in the stress scenario | €bn		**31.12.2018**
Idiosyncratic scenario	1 month	16.6
	3 months	19.2
Market-wide scenario	1 month	21.6
	3 months	22.7
Combined scenario	1 month	11.0
	3 months	11.7

Liquidity reserves

Significant factors in the liquidity risk appetite include the reserve period, the size of the liquidity reserve portfolio held to compensate for unexpected short-term liquidity outflows, and the limits in the various maturity bands. As the liquidity reserve portfolio consists of highly liquid assets, it functions as a buffer in stress situations. The liquidity reserve portfolio is funded in line with the liquidity risk appetite in order to ensure that it is kept at the required size throughout the entire reserve period stipulated by the Board of Managing Directors.

As at end 2018, the Bank had a liquidity reserve of €77.3bn in the form of highly liquid assets. A part of this liquidity reserve is held in a separate stress liquidity reserve portfolio managed by Treasury to cover liquidity outflows should a stress event occur and to ensure solvency at all times. In addition, the Bank operates an intraday liquidity reserve portfolio in the amount of €10.0bn as at the reporting date.

The liquidity reserves in the form of highly liquid assets consists of the following three components:

addLR2: Liquidity reserves from highly liquid assets

Liquidity reserves from highly liquid assets €bn	31.12.2018
Highly liquid assets	77.3
of which level 1	61.9
of which level 2A	14.1
of which level 2B	1.3

Liquidity ratios

Throughout 2018, Commerzbank's internal liquidity ratios, including the regulatory liquidity coverage ratio (LCR), were at all times above the limits set by the Board of Managing Directors. The same is true of compliance with the survival period calculation set downby MaRisk.

The regulatory LCR is integrated in the internal liquidity risk model as a binding secondary condition. The LCR is calculated as the ratio of liquid assets to net liquidity outflows under stressed conditions. It is used to measure whether a bank has a large enough liquidity buffer to independently withstand any potential imbalance between inflows and outflows of liquidity under stressed conditions over a period of 30 calendar days. The banks need to comply with a minimum ratio of 100% from 1 January 2018 onwards.

In 2018, Commerzbank significantly exceeded the minimum ratio of 100% stipulated for that year on every reporting date. As at the end of 2018, the average month-end value of the LCR over the last twelve months was 135.66%.

The Bank has established corresponding limits and early warning indicators to ensure the LCR minimum requirements are met. Further information on liquidity risk and the liquidity coverage ratio (LCR) according to the guideline on LCR disclosure – EBA/GL/2017/01 – can be found in the Annual Report 2018 in the section "Funding and liquidity of the Commerzbank Group" and in Note (69) (Liquidity Coverage Ratio) of the appendix.

F. Operational risk (OR)

Based on the Capital Requirements Regulation (CRR), Commerzbank defines operational risk (OpRisk) as the risk of loss resulting from the inadequacy or failure of internal processes, people and systems or from external events. This definition includes legal risks; it does not cover strategic or reputational risks. In view of their increased economic significance, compliance risk and cyber risk are managed as separate risk types. In line with the CRR, however, losses from compliance and cyber risks are still incorporated into the model for determining the regulatory and economic capital required for operational risks.

Risk management

Strategy and organisation

Within Commerzbank, OpRisk and governance issues of the internal control system (ICS) are closely connected in terms of both organisational structure and methodology and are continuously being enhanced. This is because many OpRisk cases are closely linked with failures in the control mechanisms. A properly functioning ICS thereby helps to reduce or avoid losses from operational risks and thus to lower the amount of capital required to cover operational risks in the medium to long term. Conversely, the operational risk management systems enable the ICS to adapt itself consistently to them. The reinforcement of the ICS structure is an essential aspect of the pro-active reduction or prevention of operational risks.

Chaired by the CRO, the Group OpRisk Committee meets four times a year and deals with the management of operational risks within the Commerzbank Group. It also acts as the escalation and decision-making committee for key OpRisk topics that span all areas. The Management Boards and/or the Segment Committees with responsibility for operational risk deal with the management of operational risk in the relevant units. They analyse OpRisk issues that affect them, such as loss events, and define subsequent measures or recommend action.

Commerzbank's OpRisk strategy is approved on an annual basis by the full Board of Managing Directors after it has been discussed and voted upon in the Group OpRisk Committee. The OpRisk strategy describes the risk profile, key elements of the desired risk culture, its management framework and measures to be taken by Commerzbank to manage operational risk.

As such, OpRisk management is based on three consecutive levels (three lines of defence) which, when taken together, are crucial for reaching the given strategic aims.

Risk management

Commerzbank takes an active approach to managing operational risk, aiming to systematically identify OpRisk profiles and risk concentrations and to define, prioritise and implement risk mitigation measures.

Operational risks are characterised by asymmetric distribution of losses. This means that most of the losses are relatively small, while isolated losses with a very low probability of occurrence have the potential to be large and devastating. This makes it necessary not only to limit high loss potential but also to proactively manage losses that can be expected to occur frequently.

To do this, Commerzbank has set up a multi-stage system that brings together the defined limits on economic capital (risk capacity) and those set for operational risk management during the year (risk appetite/tolerance), complemented by rules on the transparent and conscious acceptance and approval of individual risks (risk acceptance).

OpRisk management includes an annual evaluation of the Bank's ICS and a risk scenario assessment. OpRisk loss events are also subject to ongoing analysis and ICS backtesting on an event-driven basis. Lessons learned activities are carried out after all material loss events. External OpRisk events at competitors are also systematically evaluated.

A structured, centralised and decentralised reporting system ensures that the management of the Bank and its segments, members of the OpRisk Committee and the supervisory bodies are informed regularly, promptly and fully about operational risk. OpRisk reports are produced quarterly. They contain changes in OpRisk losses, the segments' main loss events, current risk analyses, changes in the capital requirement and the status of measures implemented. Operational risks are also part of the regular risk reporting process to the Board of Managing Directors and to the Risk Committee of the Supervisory Board.

OpRisk model

Commerzbank measures regulatory and economic capital for operational risk using the advanced measurement approach (AMA). The capital charge determined using quantitative methods is supplemented by qualitative components, in line with the requirements of CRR. The AMA is applied throughout the group.

Quantitative components

The AMA model's quantitative components include internal and external OpRisk loss data along with mathematical/statistical modelling.

Group-wide internal OpRisk loss data in line with regulatory requirements is collected from a starting threshold of €10,000 in a Group-wide loss database. As the internally calculated loss data history cannot always reflect extreme OpRisk events adequately, external OpRisk events must also be factored into the AMA model. For this purpose we use relevant external loss data from the Operational Riskdata eXchange Association (ORX), Genf, an international data consortium. For mathematical/statistical modelling, the data is grouped by combinations of business line, event category and region. Loss frequency is modelled on the basis of internal loss data, while distribution is modelled on the basis of internal and external loss data.

Modelling of insurance and alternative OpRisk transfers does not currently take place.

Qualitative components

Qualitative methods (risk scenario assessment and business environment and control system) are used to complement the information from the quantitative model components.

The risk scenario assessment is an ex-ante risk assessment of operational risks. Based on expert opinions and in accordance with the requirements of the Capital Requirement Regualtion (CRR), they serve to identify exceptionall but plausibly possible risk events which could jeopardise the Bank's existence or severely affect its results and incorporate these into modelling.

The business environment and control (BEC) system provides incentives to reduce operational risk and improve risk management. Business environment and internal control factors are shown in the OpRisk model in the form of add-ons and reductions to regulatory and economic OpRisk capital requirements. The BEC system takes into account the following qualitative OpRisk elements:

- Internal control system (ICS): As part of the annual ICS review, the company-wide ICS control mechanism is evaluated in terms of its functionality. To ensure that the internal control system factors are properly represented, the ICS as a BEC subject area consists of three components: ICS self-assessment (assessment by the units carrying out the controls), ICS testing (independent review by internal audit) and ICS documentation (modelling status in the Bank's process model).
- Human resources risk: The human resources risk report prepared by the Group Human Resources division takes into account current areas of human resources activity and presents risk information on the basis of set criteria.
- IT risk: The IT risk report prepared by the Group Services division brings together data relating to IT risk in the areas of IT security and incidents. The data cover the four IT security targets: confidentiality, integrity, availability and transparency.
- Key risk indicators (KRIs): KRIs are used to manage operational risk proactively by means of early warning signals.
- OpRisk management: The OpRisk & ICS area evaluates the active OpRisk management of the material units on the basis of a uniform list of criteria. Information on the progress made towards processing audit findings is also included in the BEC system.
- Top-level adjustments (TLAs): TLAs are only used in well-founded exceptional cases to establish a risk buffer for extraordinary changes in the OpRisk environment and include this in the OpRisk capital requirement calculation at short notice. No TLAs are currently applied.

Stress testing and validation

As an integral part of risk management and the risk-bearing capacity concept, stress tests for operational risk are carried out on a regular basis. As a basis for the stress methodology, the AMA model is consistently used to determine the capital requirement, with suitable increases in the relevant influencing factors (such as losses).

To ensure that the AMA model remains appropriate, the measurement approach is validated on a regular basis. The validation covers assessments of both quantitative and qualitative components and the interaction between them. The validation of all AMA components conducted in 2018 confirmed the appropriateness of the model. Insignificant changes are planned or have already been implemented as part of the ongoing development of the AMA measurement system. No need for material additions or changes was identified.

Outlook

From 1 January 2022, regulatory OpRisk capital will be calculated in accordance with the standardised approach (formerly the standardised measurement approach, SMA), which is based on the multiplication of two components. The business indicator component is based on the business indicator, which is the sum of an interest, a service and a financial component, and a coefficient, which is determined by the size of the business indicator. The second component, the risk-sensitive internal loss multiplier, accounts for the Bank’s internal operating losses.

G. Other risks

Beyond the risk types explicitly mentioned in the CRR and presented in the previous chapters, the following risk types were classified as material in the risk inventory for 2018 and are subject to active management within the Commerzbank Group:

- Compliance risk
- Cyber risk
- Physical asset risk
- Investment portfolio risk
- Business risk
- Reputational risk
- Model risk.

Information on taking into account the physical asset risk, investment portfolio risk and business risk can be found in the chapter on risk-bearing capacity and stress testing in this report. Details on the other risks, particularly on the reputational risk and human resources risk (a sub-category of operational risk) can be found in the risk report of the Annual Report 2018 from page 136 onwards.

Appendix

Appendix 1: Outline of the differences in the scopes of consolidation (entity by entity)

While for Commerzbank Group's Annual Report pursuant to the German Commercial Code the consolidation is based on IFRS, the information in the Disclosure Report is based on the group of companies consolidated for regulatory purposes.

Subsidiaries or companies controlled by the ultimate parent company according to IFRS, which do not belong to the financial sector are not part of the regulatory consolidation, but they are included in the consolidated accounts according to IFRS.

In applying article 436 (b) CRR the differences in the scopes of consolidation for financial accounting and regulatory purposes, respectively, have to be disclosed by the institutions. For this purpose, EBA/GL/2016/11 (Guidelines on disclosure requirements under Part Eight of regulation (EU) No 575/2013 (CRR)) provides the table EU LI3.

All entities for which the method of the accounting consolidation is different from the method of the regulatory consolidation have to be included in the disclosure. On an entity-by-entity level the method of accounting consolidation has to be disclosed and whether and how – under the regulatory scope of consolidation – the entity is recognised, supplemented by a short description of the entity.

Commerzbank complies with these requirements through the table EU LI3 given on the following pages.

EU LI3: Outline of the differences in the scopes of consolidation (entity by entity)

a	b	c	d	e	f	g
Name of the entity	Accounting consolidation	Regulatory consolidation full	pro rata	neither nor (1)	deducted	Description of the entity
1. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
10. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
11. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
12. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
13. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
14. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
2. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
3. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
4. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
5. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
6. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
7. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
8. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
9. CR Fonds-Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ABANTITIM Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ABANTUM Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ABELASSA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ABELASSA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Witt Weiden KG	not included (2)				x	Financial institution (financial firm)
ABODA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACARINA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACCESSA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACCOMO Hotel HafenCity GmbH & Co. KG	not included (2)				x	Financial institution (financial firm)
ACILIA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACINA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACONITA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACRONA Photovoltaik-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ACTOSA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ADAMANTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ADENARA Flugzeug-Leasinggesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ADMEO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ADMERA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ADRUGA Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ADURAMA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
AF Beteiligung Elf GmbH	not included (2)				x	Financial institution (financial firm)
AF Beteiligung Neun GmbH	not included (2)				x	Financial institution (financial firm)
AF Beteiligung Zehn GmbH	not included (2)				x	Financial institution (financial firm)
AF Eigenkapitalfonds für deutschen Mittelstand GmbH & Co. KG	not included (2)				x	Financial institution (financial firm)
AF Investment Drei GmbH	not included (2)				x	Financial institution (financial firm)
AF Investment Eins GmbH	not included (2)				x	Financial institution (financial firm)
AF Investment Fünf GmbH	not included (2)				x	Financial institution (financial firm)
AF Investment Sechs GmbH	not included (2)				x	Financial institution (financial firm)
AF Investment Sieben GmbH	not included (2)				x	Financial institution (financial firm)
AF Investment Vier GmbH	not included (2)				x	Financial institution (financial firm)
AF Investment Zwei GmbH	not included (2)				x	Financial institution (financial firm)
AGARBA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AGASILA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AGUSTO Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AHOIH Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AJOLA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AKA Ausfuhrkredit-Gesellschaft mbH	at equity				x	Credit institution
AKERA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALACRITAS Verwaltungs- und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)

a	b	c	d	e	f	g
Name of the entity	Accounting consolidation	Regulatory consolidation full	pro rata	neither nor (1)	deducted	Description of the entity
ALBELLA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALBOLA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALCARDA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Tübingen KG	not included (2)				x	Financial institution (financial firm)
ALDINGA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALDULA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALEMONA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALFUTURA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ALIVERA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ALLATA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ALLORUM Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ALSENNA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ALUBRA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ALVARA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ALVINA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AMALIA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
AMERA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
AMONEUS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AMTERA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANBANA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANCAVA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANDINO Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANDINO Dritte Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANDINO Vierte Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANDINO Zweite Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ANET Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ARAFINA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ARAUNA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
AREBA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ARINGO Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ARVINA Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
ASCETO Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASERTUNA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASERTUNA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Schülke-Mayr KG	not included (2)				x	Financial institution (financial firm)
ASKIBA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASSANDRA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASSENTO Photovoltaik-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASSERTA Flugzeug-Leasinggesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASTIRA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ASTRADA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ATUNO Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
AURESTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AVERTUM Flugzeug-Leasinggesellschaft mbH	not included (2)				x	Financial institution (financial firm)
AVIO Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
AVOLO Flugzeugleasinggesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Actium Leasobjekt Gesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Agate Assets S.A. S014	full (3)			x		Special purpose entity
Alma Atlas Investments Limited	not included (2)				x	Financial institution (financial firm)
Apolline Bail S.A.S.	not included (2)	x				Financial institution (financial firm)
Archicom Polska S.A.	at equity			x		Special purpose entity
Ariondaz SAS	not included (2)				x	Financial institution (financial firm)
Arvilla Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Asekum Sp. z o.o.	full (3)			x		Special purpose entity
BBB Bürgschaftsbank zu Berlin-Brandenburg GmbH	not included (2)				x	Other financial institution
BDH Development Sp. z o.o.	full (3)			x		Special purpose entity

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Name of the entity	**Accounting consolidation**	**Regulatory consolidation**				**Description of the entity**
		full	**pro rata**	**neither nor (1)**	**deducted**	
BENE Verwaltung und Treuhand GmbH	not included (2)				x	Financial institution (financial firm)
BONITAS Mobilien-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
BONITAS Mobilien-Vermietungsgesellschaft mbH & Co. Objekt Friedrichshafen KG	not included (2)				x	Financial institution (financial firm)
BREL-PRO Sp. z.o.o.	not included (2)				x	Financial institution (financial firm)
BTG Beteiligungsgesellschaft Hamburg mbH	not included (2)				x	Financial institution (financial firm)
Blue Amber Fund Management S.A.	not included (2)				x	Asset management company (Fin. Investment mgmt. company)
Borromeo Finance S.r.l.	full (3)			x		Special purpose entity
Bosphorus Capital DAC	full (3)			x		Special purpose entity
Bosphorus Investments DAC	full (3)			x		Special purpose entity
BÜRGSCHAFTSBANK BRANDENBURG GmbH	not included (2)				x	Other financial institution
Bürgschaftsbank Mecklenburg-Vorpommern GmbH	not included (2)				x	Other financial institution
Bürgschaftsbank Sachsen GmbH	not included (2)				x	Other financial institution
Bürgschaftsbank Sachsen-Anhalt GmbH	not included (2)				x	Other financial institution
Bürgschaftsbank Thüringen GmbH	not included (2)				x	Other financial institution
Bürgschaftsgemeinschaft Hamburg GmbH	not included (2)				x	Other financial institution
CANDOR Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
CDBS-Cofonds	full (3)			x		Special purpose entity
CDBS-Cofonds II	full (3)			x		Special purpose entity
CDBS-Cofonds III	full (3)			x		Special purpose entity
CDBS-Cofonds IV	full (3)			x		Special purpose entity
CDBS-Cofonds V	full (3)			x		Special purpose entity
CENULA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
CERVISIA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
CETERA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
CFB-Fonds Transfair GmbH	not included (2)				x	Financial institution (financial firm)
CHRISTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
CIMONUSA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
CR Hotel Target Pty Ltd	at equity			x		Special purpose entity
Citi Bank Custodian Platform (TCR)	full (3)			x		Special purpose entity
CoCo Finance II–2 DAC	full (3)			x		Special purpose entity
Commerz Immobilien Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Commerz Real Asset Verwaltungsgesellschaft mbH	not included (2)				x	Other financial institution
Commerz Real Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Commerz Real Fund Management S.à.r.l.	not included (2)				x	Asset management company (Fin. Investment mgmt. company)
Commerz Unternehmensbeteiligungs-Aktiengesellschaft	at equity			x		Special purpose entity
Commerzbank Finance 3 S.à.r.l.	full (3)			x		Special purpose entity
DECIMA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DIGITUS Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRABELA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRABELA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Stade KG	not included (2)				x	Financial institution (financial firm)
DREBOSTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DREBOSTA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Schwerin KG	not included (2)				x	Financial institution (financial firm)
DREDOLA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRELARA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRELARA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Freiburg KG	not included (2)				x	Financial institution (financial firm)
DRELOBA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRELOSINA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRENITA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DRESANA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
DTE Energy Center, LLC	at equity			x		Special purpose entity
Delphi I LLC	at equity				x	Financial institution (financial firm)

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	Accounting	Regulatory consolidation				Description
Name of the entity	consolidation	full	pro rata	neither nor (1)	deducted	of the entity
Deutsche Börse Commodities GmbH	not included (2)				x	Investment firm
Dr. Gubelt Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Dr. Gubelt Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Dr. Gubelt Immobilien Vermietungs-Gesellschaft mbH	not included (2)				x	Financial institution (financial firm)
EHY Real Estate Fund I, LLC	not included (2)				x	Financial institution (financial firm)
ELEGANTIA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
EURO Kartensysteme GmbH	not included (2)				x	Payment institution
EVIDENTIA Immobilien-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Entertainment Asset Holdings C.V.	full (3)			x		Special purpose entity
Entertainment Asset Holdings GP B.V.	full (3)			x		Special purpose entity
FACO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FORNAX Kraftwerk-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FRAST Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FRAST Beteiligungsgesellschaft mbH & Co. Objekt Kokerei KG	not included (2)				x	Financial institution (financial firm)
FUCATUS Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FUGA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FULGENS Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FUNGOR Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
FV Holding S.A.	at equity			x		Special purpose entity
FXSpotStream Asia GK	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
FXSpotStream Europe Ltd.	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
FXSpotStream LLC	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
Fernwärmenetz Leipzig GmbH	not included (2)				x	Financial institution (financial firm)
Film Library Holdings LLC	full (3)			x		Special purpose entity
GRADARA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRADARA Vermietungsgesellschaft mbH & Co. Objekt Neu-Ulm KG	not included (2)				x	Financial institution (financial firm)
GRAFINO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRALANA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRAMINA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRAMOLDISCUS Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRAMOLINDA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRANA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRASSANO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRATIA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRATNOMA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRENADO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRETANA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRONDOLA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GROSINA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GROTEGA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRUMENTO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRUMOSA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GRUNATA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
GUSTO Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Garbary Sp. z o.o.	full (3)			x		Special purpose entity
Gesellschaft für Kreditsicherung mbH	not included (2)				x	Financial institution (financial firm)
Green Loan Fund I	full (3)			x		Special purpose entity
Gresham Leasing March (3) Limited	not included (2)				x	Financial institution (financial firm)
HABILIS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOBANTA GmbH	not included (2)				x	Financial institution (financial firm)

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	Accounting	Regulatory consolidation				Description
Name of the entity	consolidation	full	pro rata	neither nor (1)	deducted	of the entity
HAJOBANTA GmbH & Co. Asia Opportunity I KG	at equity			x		Special purpose entity
HAJOBURGA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOGA-US Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOLENA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOLINDA Beteiligungsgesellschaft GmbH	not included (2)				x	Financial institution (financial firm)
HAJOLUCA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOMA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOMINA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJORALDIA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOSINTA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOSOLA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HAJOTARA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HDW Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HEPHAISTOS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HESTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
HORA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Hamudi S.A.	not included (2)				x	Financial institution (financial firm)
Histel Beteiligungs GmbH	not included (2)				x	Financial institution (financial firm)
ILV DRITTE Fonds-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ILV FÜNFTE Fonds-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ILV Immobilien Vermietungsgesellschaft mbH Objekte 1990	not included (2)				x	Financial institution (financial firm)
ILV Immobilien-Leasing Verwaltungsgesellschaft Düsseldorf mbH	at equity				x	Financial institution (financial firm)
ILV Leasinggesellschaft für Immobilien mbH	not included (2)				x	Financial institution (financial firm)
ILV ZWEITE Fonds-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ILV-Fonds-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Immobilien-Vermietungsgesellschaft Dr. Rühl GmbH & Co. Objekt Ratingen KG	not included (2)				x	Financial institution (financial firm)
Immobilien-Vermietungsgesellschaft Dr. Rühl GmbH & Co. Objekt Stutensee KG	not included (2)				x	Financial institution (financial firm)
J. F. Müller & Sohn Aktien-Gesellschaft	not included (2)				x	Financial institution (financial firm)
J. F. Müller & Sohn Beteiligungs GmbH	not included (2)				x	Financial institution (financial firm)
Justine Capital SRL	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO ALICANTE" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO ANCONA" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO BILBAO" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO MARSEILLE" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO PALERMO" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO TOULON" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
Kommanditgesellschaft MS "CPO VALENCIA" Offen Reederei GmbH & Co.	full (3)			x		Special purpose entity
LARIX Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LENIS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LIRIS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LIVIDA MOLARIS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LONGUM Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LOUISENA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LUTEA MOLARIS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
LiquidityMatch LLC	not included (2)				x	Financial institution (financial firm)
MADENA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MALAXA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MALEA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)

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Name of the entity	Accounting consolidation	Regulatory consolidation				Description of the entity
		full	pro rata	neither nor (1)	deducted	
MARBINO Vermietungsgesellschaft mbH & Co. Objekt BBS Stade KG	not included (2)				x	Financial institution (financial firm)
MARBREVA Vermietungsgesellschaft mbH & Co. Objekt AOK Rheinland-Pfalz KG	not included (2)				x	Financial institution (financial firm)
MARIUS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MATERNA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MAXIMA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MILES Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MILVUS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MINERVA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MIRABILIS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLANA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLANA Vermietungsgesellschaft mbH & Co. Objekt Gymnasium Harsefeld KG	not included (2)				x	Financial institution (financial firm)
MOLANCONA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLANDA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLANGA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLANZIO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLAREZZO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLARGA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLARIS Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLARIS Geschäftsführungs GmbH	not included (2)				x	Financial institution (financial firm)
MOLARIS Grundstücksverwaltung GmbH	not included (2)				x	Financial institution (financial firm)
MOLARIS Immobilienverwaltung GmbH	not included (2)				x	Financial institution (financial firm)
MOLARIS Managementgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLARIS Objektverwaltung GmbH	not included (2)				x	Financial institution (financial firm)
MOLARISSA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLAROSA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLASSA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLASSA Vermietungsgesellschaft mbH & Co. Objekt Herten KG	not included (2)				x	Financial institution (financial firm)
MOLATHINA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBAKKA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBARVA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBERA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBERNO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBOLLA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBONA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBONA Vermietungsgesellschaft mbH & Co. Objekt Schulgebäude Stade KG	not included (2)				x	Financial institution (financial firm)
MOLBRIENZA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLBURGA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLCAMPO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLCENTO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLCORA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLDEO Mobilien-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLDEO Mobilien-Vermietungsgesellschaft mbH & Co. Objekt Lünen KG	not included (2)				x	Financial institution (financial firm)
MOLDOMA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLDORA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLEMPA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLETUM Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLFOKKA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLFUNDA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLGABA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLGEDI Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLGERO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)

a	b	c	d	e	f	g
Name of the entity	Accounting consolidation	Regulatory consolidation full	pro rata	neither nor (1)	deducted	Description of the entity
MOLIGELA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLIGELA Vermietungsgesellschaft mbH & Co. Objekt Celle KG	not included (2)				x	Financial institution (financial firm)
MOLIGO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLIGO Vermietungsgesellschaft mbH & Co. Objekte Schulsanierungen Rostock KG	not included (2)				x	Financial institution (financial firm)
MOLISTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLISTA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Gesamtschule Peine KG	not included (2)				x	Financial institution (financial firm)
MOLITA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLITA Vermietungsgesellschaft mbH & Co. Objekt Klinikum Barmbek KG	not included (2)				x	Financial institution (financial firm)
MOLITA Vermietungsgesellschaft mbH & Co. Objekt TPFZ Hannover KG	not included (2)				x	Financial institution (financial firm)
MOLKANDIS Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Kaltenkichen KG	not included (2)				x	Financial institution (financial firm)
MOLMARTA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLMIRA Vermietungsgesellschft mbH	not included (2)				x	Financial institution (financial firm)
MOLOTA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLPANA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLPERA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLPETTO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLPETTO Vermietungsgesellschaft mbH & Co. Objekt Bracht KG	not included (2)				x	Financial institution (financial firm)
MOLPIKA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLPIREAS Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLPURA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLRANO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLRATUS Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLRATUS Vermietungsgesellschaft mbH & Co. Objekt Loxstedt KG	not included (2)				x	Financial institution (financial firm)
MOLRISTA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLRONDA Vermietungsgesellschaft mbH & Co. Objekt Nürnberg KG	not included (2)				x	Financial institution (financial firm)
MOLSANA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLSCHORA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLSOLA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLSOLA Vermietungsgesellschaft mbH & Co. Objekt Geminus KG	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
MOLSOLA Vermietungsgesellschaft mbH & Co. Objekt Halle Markt 11 KG	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
MOLSOLA Vermietungsgesellschaft mbH & Co. Objekt Halle Riegel KG	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
MOLSTEFFA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLSTINA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLSURA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLTANDO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLTANDO Vermietungsgesellschaft mbH & Co. Objekt Kassel KG	not included (2)				x	Financial institution (financial firm)
MOLTARA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLTIVOLA Vermietungsgesellschaft mbH & Co. Objekt Gladbeck KG	not included (2)				x	Financial institution (financial firm)
MOLUGA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLVANI Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLWALLA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MOLWANKUM Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)

a	b	c	d	e	f	g
Name of the entity	**Accounting consolidation**	**Regulatory consolidation**				**Description of the entity**
		full	**pro rata**	**neither nor (1)**	**deducted**	
MOLWORUM Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MONATA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
MONEA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Magnascope GmbH	not included (2)				x	Financial institution (financial firm)
Marie Lease S.à r.l.	not included (2)				x	Financial institution (financial firm)
Mittelständische Beteiligungsgesellschaft Berlin-Brandenburg GmbH	not included (2)				x	Financial institution (financial firm)
Mittelständische Beteiligungsgesellschaft Mecklenburg-Vorpommern mbH	not included (2)				x	Financial institution (financial firm)
Mittelständische Beteiligungsgesellschaft Niedersachsen (MBG) mit beschränkter Haftung	not included (2)				x	Financial institution (financial firm)
Mittelständische Beteiligungsgesellschaft Sachsen mbH	not included (2)				x	Financial institution (financial firm)
Mittelständische Beteiligungsgesellschaft Sachsen-Anhalt (MBG) mbH	not included (2)				x	Financial institution (financial firm)
Mittelständische Beteiligungsgesellschaft Thüringen mbH	not included (2)				x	Financial institution (financial firm)
NACOLO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NACONA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NACONGA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAFARI Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAFIRINA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NASIRO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NASTO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUCULA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAULUMO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAURANTO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAURATA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUSOLA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTARO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTESSA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTIS Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTLUS Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTORIA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAUTUGO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVALIS Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIBOLA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIBOTO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIFIORI Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIGA Schiffsbeteiligung GmbH	not included (2)				x	Financial institution (financial firm)
NAVIGATO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIGOLO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVILO Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVINA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIRENA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVIROSSA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVITA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVITARIA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVITONI Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVITOSA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NAVITURA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NEPTANA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NEPTILA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NEPTORA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NEPTUGA Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NEPTUNO Schiffsbetriebsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NERVUS Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)

a	b	c	d	e	f	g
Name of the entity	Accounting consolidation	Regulatory consolidation full	pro rata	neither nor (1)	deducted	Description of the entity
NESTOR Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NOLICA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NORA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NORA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Castrop-Rauxel KG	not included (2)				x	Financial institution (financial firm)
NORA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Koblenz-Kesselheim KG	not included (2)				x	Financial institution (financial firm)
NORA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekte Plön und Preetz KG	not included (2)				x	Financial institution (financial firm)
NOSCO Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NOTITIA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
NURUS Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
OLEANDRA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
OPTIONA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ORNATUS Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
OSKAR Medienbeteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Octopus Investment Sp. z o.o.	not included (2)				x	Financial institution (financial firm)
PACTOR Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
PAREO Kraftwerk-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
PATELLA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
PATELLA Vermietungsgesellschaft mbH & Co. Objekt Bibliothek Berlin KG	not included (2)				x	Financial institution (financial firm)
PATELLA Vermietungsgesellschaft mbH & Co. Objekt Collegium Hungaricum KG	not included (2)				x	Financial institution (financial firm)
PATELLA Vermietungsgesellschaft mbH & Co. Objekt Pulvermühle KG	not included (2)				x	Financial institution (financial firm)
PATELLA Vermietungsgesellschaft mbH & Co. Objekt Technikmuseum KG	not included (2)				x	Financial institution (financial firm)
Polski Standard Platnosci Sp. z o.o.	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
RALTO Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
RAMONIA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
RAMONIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Friedrichshafen KG	not included (2)				x	Financial institution (financial firm)
RAMONIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Lichtenau KG	not included (2)				x	Financial institution (financial firm)
RAMONIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt München-Haar KG	not included (2)				x	Financial institution (financial firm)
RANA Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
RAPIDA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
RAYMO Vierte Portfolio GmbH	not included (2)				x	Financial institution (financial firm)
RECURSA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
RESIDO Flugzeug-Leasinggesellschaft mbH	not included (2)				x	Financial institution (financial firm)
RIPA Medien-Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Dettingen KG	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Frechen KG	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Gymnasium Buchholz KG	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Kahl KG	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Ochsenfurt KG	not included (2)				x	Financial institution (financial firm)
ROSARIA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Singen KG	not included (2)				x	Financial institution (financial firm)
ROSATA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)

a	b	c	d	e	f	g
	Accounting	Regulatory consolidation				Description
Name of the entity	consolidation	full	pro rata	neither nor (1)	deducted	of the entity
ROSATA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Garching KG	not included (2)				x	Financial institution (financial firm)
ROSATA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Neustadt-Schwaig KG	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Essen KG	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Ettlingen KG	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt ISF Sindlingen KG	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Köngen KG	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Oelkinghausen KG	not included (2)				x	Financial institution (financial firm)
ROSEA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekte TANK & RAST KG	not included (2)				x	Financial institution (financial firm)
ROSINTA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ROSOLA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
ROSOLA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Lünen/Soest KG	not included (2)				x	Financial institution (financial firm)
ROSOLA Grundstücks-Vermietungsgesellschaft mbH & Co. Objekt Wetzlar KG	not included (2)				x	Financial institution (financial firm)
SENATORSKA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
SOLTRX Transaction Services GmbH	not included (2)	x				None-core services provider included in an institution's consolidated financial assets
TALORA Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
TAMOLDINA Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
TIGNARIS Beteiligungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
TIGNARIS Beteiligungsgesellschaft mbH & Co. Objekt Burscheid KG	not included (2)				x	Financial institution (financial firm)
TIGNARIS Beteiligungsgesellschaft mbH & Co. Objekt Heidelberg KG	not included (2)				x	Financial institution (financial firm)
TIGNARIS Beteiligungsgesellschaft mbH & Co. Objekt Kleve KG	not included (2)				x	Financial institution (financial firm)
TIGNARIS Beteiligungsgesellschaft mbH & Co. Objekt Ostfildern KG	not included (2)				x	Financial institution (financial firm)
TIGNARIS Beteiligungsgesellschaft mbH & Co. Objekt Überherrn KG	not included (2)				x	Financial institution (financial firm)
TIGNARIS Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Twins Financing LLC	full (3)			x		Special purpose entity
Windpark Karche 2 Verwaltungs GmbH	not included (2)				x	Financial institution (financial firm)
Windpark Ottweiler-Bexbach Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
Windsor Canada Verwaltungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)
blackprint Booster Fonds GmbH & Co. KG	not included (2)				x	Asset management company (Fin. Investment mgmt. company)
mCorporate Finance S.A.	not included (2)				x	Financial institution (financial firm)
onvista media GmbH	full (3)			x		Special purpose entity
paydirekt GmbH	not included (2)				x	None-core services provider included in an institution's consolidated financial assets
quatron Grundstücks-Vermietungsgesellschaft mbH	not included (2)				x	Financial institution (financial firm)

(1) neither consolidated nor deducted.
(2) not included due to subordinated importance.
(3) fully consolidated.

Appendix 2: Calculation of the institution-specific countercyclical capital buffer

APP2: Geographical distribution of credit exposures relevant for the calculation of the countercyclical buffer

	General credit exposures		Trading book exposure		Securitisation exposure		Capital requirements					
Countries €m	Exposure value (SA)	Exposure value (IRB)	Sum of long and short position of trading book	Value of trading book exposure (internal models)	Exposure value (SA)	Exposure value (IRB)	Of which: General credit exposures	Of which: Trading book exposures	Of which: Securitisation exposures	Total	Own funds requirements weights	Countercyclical capital buffer rate I %
Germany	12,072	182,347	0	155	42	10,020	4,769	4	101	5,092	0.544	0.00
Poland	3,972	21,262	0	0	0	15	1,120	0	0	1,120	0.120	0.00
Great Britain/ Nothern Ireland	3,076	10,956	0	35	32	1,184	697	5	13	714	0.076	1.00
USA	880	11,631	0	47	3,533	1,439	561	7	72	641	0.068	0.00
France	92	5,985	0	33	0	730	240	5	4	250	0.027	0.00
Netherlands	28	3,829	0	17	7	30	174	2	0	176	0.019	0.00
Switzerland	44	5,129	0	32	0	0	158	0	0	159	0.017	0.00
Luxembourg	16	4,134	0	7	0	40	122	1	1	124	0.013	0.00
Spain	0	2,591	0	8	62	0	107	1	1	109	0.012	0.00
Czech Republic	898	1,061	0	0	0	0	83	0	0	83	0.009	1.00
Italy	17	1,708	0	5	33	2	78	0	2	81	0.009	0.00
China	0	2,501	0	8	0	0	74	5	0	79	0.008	0.00
Austria	21	1,966	0	2	0	65	63	0	0	64	0.007	0.00
Ireland	145	1,294	0	3	0	0	60	0	0	61	0.006	0.00
Belgium	56	1,280	0	219	0	0	55	0	0	55	0.006	0.00
Russian Federation	19	1,109	0	10	0	0	43	0	0	43	0.005	0.00
Hungary	6	1,042	0	6	0	0	40	0	0	40	0.004	0.00
Cayman Islands	190	482	0	2	0	0	37	2	0	39	0.004	0.00
Cyprus	0	532	0	0	0	0	38	0	0	38	0.004	0.00
Singapore	15	885	0	0	0	0	37	0	0	37	0.004	0.00
Hong Kong	0	828	0	0	0	0	36	0	0	36	0.004	1.88
Sweden	0	1,041	0	11	0	0	33	0	0	33	0.004	2.00
Canada	12	1,522	0	5	0	0	28	0	0	28	0.003	0.00
Slovakia	218	374	0	0	0	0	27	0	0	27	0.003	1.25
Jersey	0	301	0	0	0	0	26	0	0	26	0.003	0.00
Denmark	0	587	0	2	0	0	23	0	0	24	0.003	0.00
Portugal	109	402	0	0	19	0	19	0	1	19	0.002	0.00
Japan	1	336	0	0	0	0	17	0	0	18	0.002	0.00
Turkey	42	599	0	0	0	0	12	0	0	12	0.001	0.00
Finland	0	361	0	1	0	0	11	0	0	11	0.001	0.00
Romania	0	167	0	0	0	0	11	0	0	11	0.001	0.00
Australia	7	316	0	5	0	0	8	2	0	10	0.001	0.00
India	2	322	0	0	0	0	7	0	0	7	0.001	0.00
Brazil	53	133	0	1	0	0	6	1	0	7	0.001	0.00
Peru	0	188	0	0	0	0	7	0	0	7	0.001	0.00
Norway	7	236	0	2	0	0	7	0	0	7	0.001	2.00
Ghana	0	79	0	0	0	0	6	0	0	6	0.001	0.00

APP2_cont.: Geographical distribution of credit exposures relevant for the calculation of the countercyclical buffer

	General credit exposures		Trading book exposure		Securitisation exposure		Capital requirements					
Countries €m	**Exposure value (SA)**	**Exposure value (IRB)**	**Sum of long and short position of trading book**	**Value of trading book exposure (internal models)**	**Exposure value (SA)**	**Exposure value (IRB)**	**Of which: General credit exposures**	**Of which: Trading book exposures**	**Of which: Securitisation exposures**	**Total**	**Own funds requirements weights**	**Countercyclical capital buffer rate I %**
Rep. of Iceland	0	225	0	0	0	0	6	0	0	6	0.001	1.25
Chile	0	53	0	0	0	0	5	0	0	5	0.001	0.00
Liberia	0	38	0	0	0	0	5	0	0	5	0.001	0.00
Korea (South)	0	84	0	57	0	0	3	2	0	5	0.001	0.00
Vietnam	0	192	0	0	0	0	5	0	0	5	0.000	0.00
Bermuda	0	291	0	0	0	0	4	0	0	4	0.000	0.00
Virgin Islands (brit)	25	17	0	0	0	0	4	0	0	4	0.000	0.00
Slovenia	0	71	0	0	0	0	3	0	0	3	0.000	0.00
Israel	4	100	0	0	0	0	2	0	0	2	0.000	0.00
Curacao	0	75	0	0	0	0	2	0	0	2	0.000	0.00
Kuwait	0	99	0	0	0	0	2	0	0	2	0.000	0.00
Panama	0	47	0	0	0	0	2	0	0	2	0.000	0.00
Kazakhstan	0	27	0	0	0	0	2	0	0	2	0.000	0.00
Mexico	0	52	0	1	0	0	2	0	0	2	0.000	0.00
Saudi Arabia	0	88	0	0	0	0	1	0	0	1	0.000	0.00
Quatar	0	44	0	0	0	0	1	0	0	1	0.000	0.00
Mongolia	0	38	0	0	0	0	1	0	0	1	0.000	0.00
Greenland	0	55	0	0	0	0	1	0	0	1	0.000	0.00
Indonesia	0	152	0	0	0	0	1	0	0	1	0.000	0.00
UAE	0	167	0	0	0	0	1	0	0	1	0.000	0.00
Liechtenstein	0	80	0	0	0	0	1	0	0	1	0.000	0.00
Malaysia	3	28	0	0	0	0	1	0	0	1	0.000	0.00
Taiwan	0	32	0	0	0	0	1	0	0	1	0.000	0.00
Bahrain	0	197	0	0	0	0	1	0	0	1	0.000	0.00
Saint Kitts and Nevis	0	48	0	0	0	0	1	0	0	1	0.000	0.00
South Africa	1	40	0	9	0	0	1	0	0	1	0.000	0.00
Malta	0	28	0	0	0	0	1	0	0	1	0.000	0.00
New Zealand	0	78	0	0	0	0	1	0	0	1	0.000	0.00
Others	1	500	0	0	0	0	4	0	0	4	0.000	
Total	**22,034**	**272,463**	**0**	**687**	**3,729**	**13,525**	**8,906**	**39**	**197**	**9,360**	**1.000**	

APP2: Amount of institution-specific countercyclical capital buffer

€m	**31.12.2018**
Total risk exposure amount	180,498.38
Institution specific countercyclical buffer rate (%)	0.105
Institution specific countercyclical buffer requirement	190.37

Appendix 3: Supplement to equity structure (CAP1)

Line	(B) Reference to article in the regulation (EU) Nr. 575/2013
1	26 (1), 27, 28, 29
1a	EBA list 26 (3)
1b	EBA list 26 (3)
2	26 (1) (c)
3	26 (1)
3a	26 (1) (f)
4	486 (2)
5	84
5a	26 (2)
6	
7	34, 105
8	36 (1) (b), 37
10	36 (1) (c), 38
11	33 (1) (a)
12	36 (1) (d), 40, 159
13	32 (1)
14	33 (1) (b)
15	36 (1) (e), 41
16	36 (1) (f), 42
17	36 (1) (g), 44
18	36 (1) (h), 43, 45, 46, 49 (2) & (3), 79
19	36 (1) (i), 43, 45, 47, 48 (1) (b), 49 (1) - (3), 79
20a	36 (1) (k)
20b	36 (1) (k) (i), 89 - 91
20c	36 (1) (k) (ii), 243 (1) (b), 244 (1) (b), 258
20d	36 (1) (k) (iii), 379 (3)
21	36 (1) (c), 38, 48 (1) (a)
22	48 (1)
23	36 (1) (i), 48 (1) (b)
25	36 (1) (c), 38, 48 (1) (a)
25a	36 (1) (a)
25b	36 (1) (l)
27	36 (1) (j)
28	
29	
30	51, 52
31	
32	
33	486 (3)
34	85, 86
35	486 (3)
36	
37	52 (1) (b), 56 (a), 57
38	56 (b), 58
39	56 (c), 59, 60, 79
40	56 (d), 59, 79
42	56 (e)
43	
44	
45	
46	62, 63
47	486 (4)
48	87, 88
49	486 (4)
50	62 (c) & (d)
51	
52	63 (b) (i), 66 (a), 67
53	66 (b), 68
54	66 (c), 69, 70, 79
55	66 (d), 69, 79
57	
58	
59	
60	
61	92 (2) (a)
62	92 (2) (b)
63	92 (2) (c)
64	CRD 128, 129, 130, 131, 133
65	
66	
67	
67a	
68	CRD 128
72	36 (1) (h), 45, 46, 56 (c), 59, 60, 66 (c), 69, 70
73	36 (1) (i), 45, 48
75	36 (1) (c), 38, 48
76	62
77	62
78	62
79	62
80	484 (3), 486 (2) & (5)
81	484 (3), 486 (2) & (5)
82	484 (4), 486 (3) & (5)
83	484 (4), 486 (3) & (5)
84	484 (5), 486 (4) & (5)
85	484 (5), 486 (4) & (5)

Appendix 4: Material geographical regions or countries

The following threshold of materiality was taken as a basis for the representation in tables EU CRB-C and EU CR1-C: all countries with a net exposure share of the total exposure of at least 1 %, are disclosed individually within their region, all other countries within that region are summarised under „other countries“. All regions with a net exposure share of the total exposure of at least 1 % are disclosed as individual regions, all remaining regions are summarised as „other regions“. For information purposes only, the following table displays all countries / regions on a single basis with a share in net total exposure of ≥ 0,1%.

Region/Country		Share of total exposure
Region: Western Europe		**74.92%**
1	Germany	56.64%
2	UK	3.84%
3	Italy	2.61%
4	France	2.39%
5	Switzerland	2.08%
6	Netherlands	1.26%
7	Spain	1.19%
8	Luxembourg	0.80%
9	Austria	0.79%
10	Belgium	0.60%
11	Sweden	0.54%
12	Turkey	0.45%
13	Ireland	0.39%
14	Norway	0.29%
15	Portugal	0.29%
16	Denmark	0.25%
17	Finland	0.16%
18	Cyprus	0.11%
	other countries, each with a share of less than 0.1% of the total exposure	in total about 0.2%
Region: Eastern Europe		**9.25%**
1	Poland	7.36%
2	Czech. Republic	0.66%
3	Russia	0.57%
4	Hungary	0.36%
5	Slovakia	0.13%
	other countries, each with a share of less than 0.1% of the total exposure	in total about 0.2%
Region: North America		**5.88%**
1	USA	5.00%
2	Canada	0.87%
3	Greenland	0.01%

Region/Country		Share of total exposure
Region: Asia		**7.53%**
1	Japan	3.44%
2	China	1.43%
3	Singapore	0.36%
4	India	0.33%
5	South Korea	0.31%
6	Hongkong	0.22%
7	Quatar	0.17%
8	Bangladesh	0.16%
9	United Arab Emirates	0.15%
10	Vietnam	0.12%
11	Indonesia	0.11%
	other countries, each with a share of less than 0.1% of the total exposure	in total about 0.7%
Region: Latin America		**1.27%**
1	Brazil	0.61%
2	Bermuda (GBR)	0.13%
3	Cayman Islands (GBR)	0.11%
	other countries, each with a share of less than 0.1% of the total exposure	in total about 0.4%
Region: Africa		**0.62%**
1	Egypt	0.16%
	other countries, each with a share of less than 0.1% of the total exposure	in total about 0.5%
Other regions:		**0.53%**
1	International organisations	0.27%
2	Oceania	0.10%
3	Others	0.16%

Appendix 5: Credit risk parameters by geographical location

Commerzbank uses its own estimates of LGD for the calculation of risk-weighted exposure amounts. Hence, according to Art. 452 j) (i) CRR, the credit risk parameters (position-weighted average LGD and PD in percent) for each geographical location and each asset class has to be disclosed. This information is given in the following table APP5.

APP5: Credit risk parameters by geographical location (incl. default portfolio, i.e. for default positions PD=1)

	in %	Belgium	Brazil	China	Germany	France	UK	Hongkong	Italy	Japan	Luxembourg	Netherlands
Central governments or central banks	Ø LGD		99.75	68.95	20.38		15.10	100.00	54.42	20.01		
	Ø PD		0.68	0.17	0.03		0.02	0.04	0.55	0.19		
Institutions	Ø LGD	32.12	40.59	43.27	38.92	36.54	53.78	54.49	52.55	42.42	42.89	47.20
	Ø PD	0.08	0.67	0.44	0.16	0.09	0.12	0.09	0.80	0.07	0.06	0.14
Corporates	Ø LGD	42.92	38.21	37.14	37.84	41.00	47.21	40.35	42.94	40.27	39.48	39.71
	Ø PD	0.71	0.76	0.35	3.19	1.17	0.95	0.55	2.69	0.62	6.62	2.38
thereof specialised lending	Ø LGD	42.42		12.08	34.79	48.44	39.57	49.29	65.27		52.42	34.30
	Ø PD	5.97		9.95	8.57	8.64	4.38	0.20	22.83		30.05	16.14
thereof SMEs	Ø LGD	40.40		41.60	40.89	42.41	55.33	40.20	59.05		45.00	41.00
	Ø PD	11.69		0.34	5.42	0.08	4.25	0.39	28.97		0.51	0.49
Retail	Ø LGD	22.41	26.36	25.14	25.90	24.10	22.31	27.54	24.59	29.62	27.61	24.82
	Ø PD	0.45	0.25	0.55	1.07	0.82	0.91	0.38	1.13	1.30	1.70	0.98
Secured by mortg. on immov. property, SMEs	Ø LGD				27.51							31.20
	Ø PD				1.04							0.26
Sec. by mortg.on immov. property, excl. SMEs	Ø LGD	14.64	10.40	13.17	15.06	13.98	12.99	13.81	14.08	15.51	14.56	14.82
	Ø PD	0.34	0.15	0.22	0.73	0.95	0.84	0.33	0.84	0.30	3.51	0.52
Qualifying revolving	Ø LGD	59.87	59.46	54.49	59.35	59.48	58.76	55.66	60.98	61.50	58.31	59.80
	Ø PD	0.34	0.25	0.09	0.46	0.40	0.38	0.15	0.48	1.98	0.20	0.70
Other, SMEs	Ø LGD	52.02		44.15	45.81	36.18	41.37	42.19	52.42	43.14	46.87	38.52
	Ø PD	0.21		2.30	4.21	0.77	0.37	0.64	6.12	1.70	0.55	5.04
Other, excluding SMEs	Ø LGD	27.62	39.20	32.94	36.36	26.67	27.92	39.63	24.15	24.92	36.44	36.37
	Ø PD	0.82	1.07	0.46	1.38	0.78	1.13	0.38	1.47	3.24	0.20	1.42
Total	**Ø LGD**	**40.03**	**43.37**	**42.60**	**30.60**	**39.46**	**48.71**	**45.56**	**48.22**	**20.73**	**39.86**	**40.45**
	Ø PD	**0.57**	**0.67**	**0.39**	**1.79**	**0.83**	**0.71**	**0.45**	**1.63**	**0.19**	**5.64**	**2.06**

APP5_cont.: Credit risk parameters by geographical location (incl. default portfolio, e.g. for default positions PD=1)

	in %	Austria	Poland	Russia	Switzer-land	Singa-pore	Slova-kia	Spain	Czech Republic	Hun-gary	Unit. Arab Emirates	USA
Central governments or central banks	Ø LGD		38.23	79.17	10.00	16.47			65.30	100.00	83.06	15.00
	Ø PD		0.13	0.26	0.02	0.02			0.06	0.26	0.09	
Institutions	Ø LGD	20.83	28.46	39.57	28.93	46.14	43.89	29.32	43.07	40.72	46.10	42.40
	Ø PD	0.18	0.30	2.72	0.06	0.04	0.14	0.41	0.06	0.24	0.31	0.83
Corporates	Ø LGD	39.75	43.29	40.62	37.96	39.07	39.77	39.16	38.84	41.19	12.92	42.31
	Ø PD	1.38	4.67	0.99	1.31	0.70	0.58	1.38	3.96	1.08	1.23	1.16
thereof specialised lending	Ø LGD	24.43			3.31	9.72		36.21	33.32	91.77		55.69
	Ø PD	43.34			0.52	2.41		1.96	3.09	0.69		1.30
thereof SMEs	Ø LGD	41.78	44.15		40.06	42.93	34.97	40.57	64.99	40.69		45.55
	Ø PD	0.64	3.99		0.45	0.11	0.29	0.15	54.67	3.45		1.11
Retail	Ø LGD	29.61	35.93	20.23	21.88	27.19	33.91	26.52	38.53	40.48	25.55	23.74
	Ø PD	1.60	6.15	1.03	0.64	0.41	13.10	0.82	2.67	9.79	0.72	0.96
Secured by mortg. on immov. property, SMEs	Ø LGD		33.93						30.00			
	Ø PD		8.01						0.58			
Sec. by mortg.on immov. property, excl. SMEs	Ø LGD	14.11	27.44	18.30	14.25	15.13	11.72	13.07	12.94	10.37	14.25	13.98
	Ø PD	0.80	4.07	0.99	0.45	0.34	67.38	0.29	1.27	0.11	0.91	0.89
Qualifying revolving	Ø LGD	58.85	61.75	59.01	58.53	56.09	62.74	60.35	61.09	59.92	56.10	59.86
	Ø PD	0.28	1.19	0.27	0.48	0.65	0.25	0.52	0.60	1.03	0.44	0.32
Other, SMEs	Ø LGD	41.03	36.42	42.88	40.41	43.52	36.03	50.07	39.32	44.30		40.00
	Ø PD	1.79	8.16	5.13	1.31	0.46	3.24	4.47	3.32	12.76		1.06
Other, excluding SMEs	Ø LGD	33.41	50.89	16.93	30.31	36.88	49.52	29.78	45.05	47.21	33.21	31.15
	Ø PD	2.45	7.98	0.86	0.96	0.50	7.13	1.79	3.06	4.48	0.58	1.29
Total	**Ø LGD**	**35.33**	**38.47**	**45.05**	**32.86**	**32.47**	**39.73**	**36.43**	**43.00**	**45.24**	**43.06**	**36.48**
	Ø PD	**1.15**	**5.45**	**1.43**	**0.84**	**0.42**	**0.69**	**1.11**	**3.27**	**1.12**	**0.47**	**0.86**

Appendix 6: Overview – Compliance with the CRR requirements

Commerzbank Group's compliance with the CRR requirements as at 31 December 2018 is given in detail in the following overview APP6.

APP6: Overview – Compliance with the CRR requirements

Article CRR	Topic	Reference to disclosure (Chapter of Disclosure Report or reference to separate document)	Tables
431 - 434	Scope of disclosure requirements Non-material, proprietary or confidential information Frequency and means of disclosures	Introduction > Objective of the Disclosure Report Introduction > Scope Introduction > Waiver rule pursuant to Article 7 CRR	–
435(1) a)-d)	Risk management objectives and policies	Risk-oriented overall bank management > Risk management organisation > Risk strategy and risk management > Risk-bearing capacity and stress testing	–
		Specific risk management > A. Credit risk (CR) > Risk management > B. Counterparty credit risk (CCR) > Risk management > D. Market risk (MR) > Risk management > E. Liquidity risk (LR) > F. Operational risk (OR) > Risk management	–
		Annual Report 2018: > Economic report > Funding and liquidity of the Commerzbank Group	–
		Annual Report 2018: >Notes (69) Liquidity Coverage Ratio	–
435(1) e), f)	Risk management objectives and policies	Risk-oriented overall bank management > Risk statement	–
		Annual Report 2018: > Economic report > Funding and liquidity of the Commerzbank Group	–
		Annual Report 2018: > Notes (69) Liquidity Coverage Ratio	–
435(2) a) - d)	Governance arrangements	Annual Report 2018: Corporate governance report, chapters Board of Managing Directors, Supervisory Board and Diversity Homepage: https://www.commerzbank.de/en/hauptnavigation/aktionaere/governance_/corporate_governace_1.html	–
435(2) e)	Governance arrangements	Risk-oriented overall bank management > Risk management organisation > Risk strategy and risk management	–
436 a)	Scope of application	Introduction > Scope	–
436 b)	Scope of application	Total capital, capital requirement and RWA > Connection between balance-sheet and regulatory positions	EU LI1 EU LI2
		Appendix > Appendix 1	EU LI3
436 c), d)	Scope of application	Total capital, capital requirement and RWA > Connection between balance-sheet and regulatory positions	–
436 e)	Scope of application	Introduction > Waiver rule pursuant to Article 7 CRR	–
437(1) a) 437(2)	Own funds	Total capital, capital requirement and RWA > Connection between balance-sheet and regulatory positions	CAP2
437(1) b)-c)	Own funds	Homepage: https://www.commerzbank.de/en/hauptnavigation/aktionaere/informationen_f_r_fremdkapitalgeber/kapitalinstrumente/CapitalInstruments.html	–
437(1) d)-f) 437(2)	Own funds	Total capital, capital requirement and RWA > Capital structure Appendix > Appendix 3	CAP1 APP3
438 a), b)	Capital requirements	Risk-oriented overall bank management > Risk-bearing capacity and stress testing	RBC1
438 c)-f)	Capital requirements	Total capital, capital requirement and RWA > Capital requirement and RWA	EU OV1
438 d)	Capital requirements	Specific risk management > A.Credit risk (CR) > Credit risk and credit risk mitigation in the IRBA	EU CR8
		Specific risk management > B. Counterparty credit risk (CCR) > Information by regulatory risk-weighting approach	EU CCR7
438 last paragraph	Capital requirements	Specific risk management > A.Credit risk (CR) > Credit risk and credit risk mitigation in the IRBA	EU CR10

Article CRR	Topic	Reference to disclosure (Chapter of Disclosure Report or reference to separate document)	Tables
439 a)-c), i)	Counterparty credit risk	Specific risk management > B. Counterparty credit risk (CCR) > Risk management	–
439 d), e), g), h)	Counterparty credit risk	Specific risk management > B. Counterparty credit risk (CCR) > Further information on counterparty credit risk	EU CCR5-A EU CCR5-B EU CCR6 addCCR1
439 e), f), i)	Counterparty credit risk	Specific risk management > B. Counterparty credit risk (CCR) > Information on regulatory methods	EU CCR1 EU CCR2 EU CCR8
440	Capital buffers	Appendix > Appendix 2	APP2
441	Indicators of global systemic importance	Homepage: https://www.commerzbank.de/en/hauptnavigation/aktionaere/informationen_f_r_fremdkapitalgeber/deckungsregister/transparenzangaben.html	–
442 a)-b)	Credit risk adjustments	Specific risk management > A. Credit risk (CR) > Loan loss provisions for default risks	–
442 c)-f)	Credit risk adjustments	Specific risk management > A. Credit risk (CR) > Overarching portfolio analyses	EU CRB-B EU CRB-C EU CRB-D EU CRB-E
		Appendix > Appendix 4	–
442 g)-i)	Credit risk adjustments	Specific risk management > A. Credit risk (CR) > Loan loss provisions for default risks	EU CR1-A EU CR1-B EU CR1-C EU CR1-D EU CR1-E EU CR2-A EU CR2-B
443	Unencumbered assets	Annual Report 2018: > Information on the encumbrance of assets	–
444 a)-e)	Use of ECAIs	Specific risk management >A. Credit risk (CR) > Credit risk and credit risk mitigation in the SACR	EU CR4 EU CR5
444 e)	Use of ECAIs	Specific risk management > B. Counterparty credit risk (CCR) > Information by regulatory risk-weighting approach	EU CCR3
445	Market risk	Specific risk management > D. Market risk (MR) > Quantitative information on market risk	EU MR1
446	Operational risk	Specific risk management > F. Operational risk (OR)	–
447 a) - e)	Exposures in equities not included in the trading book	Specific risk management > A. Credit risk (CR) > Investments in the banking book	INV1 INV2
448 a)	Exposure to interest rate risk on positions not included in the trading book	Specific risk management > D. Market risk (MR) > Interest rate risk in the banking book	addMR3
449 a)-r)	Exposure to securitisation positions	Specific risk management > C. Securitisations (SEC)	SEC1 SEC2 SEC3 SEC4 SEC5 SEC6
450	Remuneration policy	Annual Report 2018: > Remuneration Report Remuneration Report on the homepage: https://www.commerzbank.de/en/hauptnavigation/aktionaere/publikationen_und_veranstaltungen/unternehmensberichterstattung_1/index.html	–
451	Leverage	Annual Report 2018: > Notes (67) Regulatory capital requirements > Notes (68) Leverage ratio	–
452 a)-c)	Use of the IRB Approach to credit risk	Specific risk management > A. Credit risk (CR)	VAL0_1 VAL0_2

Article CRR	Topic	Reference to disclosure (Chapter of Disclosure Report or reference to separate document)	Tables
452 d)-f)	Use of the IRB Approach to credit risk	Specific risk management > A. Credit risk (CR) > Credit risk and credit risk mitigation in the IRBA	EU CR6
		Spezifisches Risikomanagement > B. Counterparty credit risk (CCR) > Information by regulatory risk-weighting approach	EU CCR4
452 g), i)	Use of the IRB Approach to credit risk	Specific risk management >A. Credit risk (CR) > Loan loss provisions for default risks	addCR1 addCR2
452 i), h)	Use of the IRB Approach to credit risk	Specific risk management > A. Credit risk (CR) > Credit risk model > Validation	VAL1 VAL2 EU CR9
452 j)	Use of the IRB Approach to credit risk	Appendix > Appendix 5	APP5
453 a)	Use of credit risk mitigation techniques	Specific risk management > A. Credit risk (CR) > Credit risk mitigation > B. Counterparty credit risk (CCR) > Risk management	–
453 a)-e)	Use of credit risk mitigation techniques	Specific risk management > A. Credit risk (CR) > Credit risk mitigation	CRM1 CRM2
453 f)	Use of credit risk mitigation techniques	Specific risk management > A. Credit risk (CR) > Credit risk and credit risk mitigation in the IRBA	EU CR7
453 f), g)	Use of credit risk mitigation techniques	Specific risk management > A. Credit risk (CR) > Credit risk mitigation	EU CR3
454	Use of the Advanced Measurement Approaches to operational risk	Specific risk management > F. Operational risk (OR)	–
455 a), b)	Use of Internal Market Risk Models	Specific risk management > D. Market risk (MR) > Risk management > D. Market risk (MR) > Market risk model	–
455 c)	Use of Internal Market Risk Models	Specific risk management > D. Market risk (MR) > Risk management > Tradability and measurement of financial instruments	–
455 d)e)	Use of Internal Market Risk Models	Specific risk management > D. Market risk (MR) > Quantitative information on market risk	EU MR2-A EU MR2-B EU MR3 addMR1 addMR2
455 g)	Use of Internal Market Risk Models	Specific risk management > D. Market risk (MR) > Market risk model	EU MR4

List of abbreviations

ABCP	Asset-backed Commercial Paper
ABS	Asset-backed Securities
AC	Amortised Cost
ACR	Asset & Capital Recovery
ALCO	Asset Liability Committee
AMA	Advanced Measurement Approach
AUC	Area under the curve
BaFin	Federal Financial Supervisory Authority
BEC	Business Environment and Control System
CCF	Credit Conversion Factor
CCR	Counterparty Credit Risk
CMBS	Commercial Mortgage-backed Securities
COREP	Common solvency ratio reporting
CP	Commercial Paper
CR	Credit Risk
CRD	Capital Requirements Directive
CRM	Credit Risk Mitigation
CRO	Chief Risk Officer
CRR	Capital Requirements Regulation
CVA	Credit Valuation Adjustment
CVaR	Credit Value at Risk
EaD	Exposure at Default
EBA	European Banking Authority
ECB	European Central Bank
EEPE	Effected Expected Positive Exposure
EL	Expected Loss
ErC	Economically required Capital
FINREP	Financial Reporting
FVOCI	Fair Value through Other Comprehensive Income
FVPL	Fair Value through P&L
GL	Guideline
G-SII	Global Systemically Important Institution
HGB	German Commercial Code
IAA	Internal Assessment Approach
IAS	International Accounting Standards
ICAAP	Internal Capital Adequacy Assessment Process
ICS	Internal Control System
IFRS	International Financial Reporting Standards
IMA	Internal Model Approach
IMM	Internal Model Method
IPV	Independent Price Verification
IRBA	Internal Ratings Based Approach
IRC	Incremental Risk Charge
ISDA	International Swaps and Derivatives Association
ISIN	International Securities Identification Number
ITS	Implementing Technical Standards
KRI	Key Risk Indicators
KWG	German Banking Act
LaD	Loss at Default
LCR	Liquidity Coverage Ratio
LECL	Lifetime Expected Credit Loss
LGD	Loss Given Default
LR	Liquidity Risk
LTA	Look-through Approach
MaRisk	Minimum Requirements for Risk Management
MR	Market Risk
OpRisk	Operational Risk
OR	Operational Risk
ORX	Operational Riskdata eXchange Association, Geneva
O-SII	Other Sytemically Important Institution
P&L	Profit & Loss
PD	Probability of Default
RBC ratio	Risk-bearing capacity ratio
RMBS	Residential Mortgage-backed Securities
RTS	Regulatory Technical Standards
RW	Risk weight
RWA	Risk-weighted Assets
SACR	Standardised Approach to Credit Risk
SEC	Securitizations
SFA	Supervisory Formula Approach
SFT	Securities Financing Transactions
SME	Small and medium-sized enterprises
SolvV	German Solvency Regulation
SPV	Special Purpose Vehicles
SPPI	Solely Payment of Principal and Interest
SREP	Supervisory Review and Evaluation Process
sVaR	stressed Value-at-Risk
TLA	Top Level Adjustment
VaR	Value-at-Risk

Disclaimer

Commerzbank's internal risk measurement methods and models which form the basis for the calculation of the figures shown in this report are state-of-the-art and based on banking sector practice. The risk models produce results appropriate to the management of the Bank. The measurement approaches are regularly reviewed by risk control and internal audit, external auditors and the German and European supervisory authorities. Despite being carefully developed and regularly monitored, models cannot cover all the influencing factors that have an impact in reality or illustrate their complex behaviour and interactions. These limits to risk modelling apply particularly in extreme situations. Supplementary stress tests and scenario analyses can only show examples of the risks to which a portfolio may be exposed in extreme market situations. However, stress testing all imaginable scenarios is not feasible. Stress tests cannot offer a final estimate of the maximum loss should an extreme event occur.

The interpretations with regard to CRR/CRD IV rules are still ongoing. Therefore requirements for adjustment may occure due, for example, to modified interpretations in the course of the Q&A-process with EBA or due to new binding Technical Standards or guidelines. Against this background we will continue to refine our methods and models in line with the interpretation of the rules. Thus, our measures may not be comparable with previously published measures and our competitors' measures published may differ from ours.

This Annual Report contains forward-looking statements on Commerzbank's business and earnings performance, which are based upon our current plans, estimates, forecasts and expectations. The statements entail risks and uncertainties, as there are a variety of factors which influence our business and to a great extent lie beyond our sphere of influence. Above all, these include the economic situation, the state of the financial markets worldwide and possible loan losses. Actual results and developments may, therefore, diverge considerably from our current assumptions, which, for this reason, are valid only at the time of publication. We undertake no obligation to revise our forward-looking statements in the light of either new information or unexpected events.

Commerzbank AG
Head Office
Kaiserplatz
Frankfurt am Main
www.commerzbank.com

Postal address
60261 Frankfurt am Main
Tel. +49 69 136-20
info@commerzbank.com

Investor Relations
Tel. +49 69 136-21331
Fax +49 69 136-29492
ir@commerzbank.com