Credit Suisse Group AG

CREDIT SUISSE

Pillar 3 and regulatory disclosures

4Q18

For purposes of this report, unless the context otherwise requires, the terms “Credit Suisse,” the “Group,” “we,” “us” and “our” mean Credit Suisse Group AG and its consolidated subsidiaries. The business of Credit Suisse AG, the direct bank subsidiary of the Group, is substantially similar to the Group, and we use these terms to refer to both when the subject is the same or substantially similar. We use the term the “Bank” when we are only referring to Credit Suisse AG and its consolidated subsidiaries.

Abbreviations are explained in the List of abbreviations in the back of this report.

Publications referenced in this report, whether via website links or otherwise, are not incorporated into this report.

In various tables, use of “–” indicates not meaningful or not applicable.

Pillar 3 and regulatory disclosures 4Q18

Credit Suisse Group AG

2 Introduction

4 Swiss capital requirements

6 Overview of risk management

7 Risk-weighted assets

8 Linkages between financial statements and regulatory exposures

12 Credit risk

44 Counterparty credit risk

54 Securitization

60 Market risk

64 Interest rate risk in the banking book

66 Additional regulatory disclosures

73 List of abbreviations

74 Cautionary statement regarding forward-looking information

Introduction

General

This report as of December 31, 2018 for the Group is based on the revised Circular 2016/1 "Disclosure – banks" (FINMA circular) issued by the Swiss Financial Market Supervisory Authority FINMA (FINMA) on July 16, 2018. The revised FINMA circular includes the implementation of the revised Pillar 3 disclosure requirements issued by the Basel Committee on Banking Supervision (BCBS) in March 2017 and requires banks to gradually implement the new requirements from December 31, 2018 onwards.

This report is produced and published quarterly, in accordance with FINMA requirements. The reporting frequency for each disclosure requirement is either annual, semi-annual or quarterly. This document should be read in conjunction with the Pillar 3 and regulatory disclosures – Credit Suisse Group AG 2Q18 and 3Q18 and the Credit Suisse Annual Report 2018, which includes important information on regulatory capital, risk management (specific references have been made herein to these documents) and regulatory developments and proposals.

The highest consolidated entity in the Group to which the FINMA circular applies is Credit Suisse Group.

These disclosures were verified and approved internally in line with our board-approved policy on disclosure controls and procedures. The level of internal control processes for these disclosures is similar to those applied to the Group's quarterly and annual financial reports. This report has not been audited by the Group's external auditors.

For certain prescribed table formats where line items have zero balances, such line items have not been presented.

Other regulatory disclosures

In connection with the implementation of Basel III, certain regulatory disclosures for the Group and certain of its subsidiaries are required. The Group's Pillar 3 disclosure, regulatory disclosures, additional information on capital instruments, including the main features of regulatory capital instruments and total loss-absorbing capacity (TLAC)-eligible instruments that form part of the eligible capital base and TLAC resources, G-SIB financial indicators, reconciliation requirements, leverage ratios and certain liquidity disclosures as well as regulatory disclosures for subsidiaries can be found on our website.

→ Refer to credit-suisse.com/regulatorydisclosures for additional information.

Regulatory developments

In December 2018, BCBS published the finalized Pillar 3 disclosure requirements. These requirements, together with the updates published in January 2015 and March 2017, complete the Pillar 3 framework. The revised framework covers three elements. The first element, to be implemented by January 1, 2022, relates to revisions and additions arising from the finalization of the Basel III regulatory reforms in 2017. This element includes revised disclosure regarding credit risk, operational risk, the leverage ratio and credit valuation adjustment (CVA) risk, risk-weighted assets (RWA) as calculated by the bank's internal models as compared to the standardized approaches and an overview of risk management, RWA and key prudential metrics. As a second element, the updated framework sets out new disclosure requirements on asset encumbrance designed to provide a preliminary overview of the extent to which a bank's assets remain available to creditors in the event of an insolvency. As a third element, the revised framework introduces new disclosure requirements relating to constraints on capital distributions, when required by national supervisors at the jurisdictional level. The second and third elements must be implemented by end-2020.

Location of disclosures

This report provides the Pillar 3 and regulatory disclosures required by the FINMA circular for the Group to the extent that these disclosures are not included in the Credit Suisse Annual Report 2018 or in the regulatory disclosures on our website.

→ Refer to "Annual Report" under credit-suisse.com/ar for disclosures included in the Credit Suisse Annual Report 2018.

Location of disclosures

FINMA disclosure requirements	Location	Page number
Overview of risk management, key prudential metrics and risk-weighted assets		
Key prudential metrics [Table KM1]	Qualitative disclosures: "Treasury, Risk, Balance sheet and Off-balance sheet"	117 – 136
Risk management approach [Table OVA]	"Risk management oversight" "Risk appetite framework" "Risk coverage and management"	143 – 147 147 – 150 150 – 180
Overview of risk-weighted assets [Table OV1]	Qualitative disclosures: "Risk-weighted assets"	131 – 133
Linkages between financial statements and regulatory exposures		
Valuation process [Table LIA]	"Fair valuations" "Critical accounting estimates – Fair value" "Note 35 – Financial instruments"	70 107 359 – 363
Composition of capital and TLAC		
Differences in basis of consolidation [Table CC2]	List of significant subsidiaries and associated entities: "Note 40 – Significant subsidiaries and equity method investments" Changes in scope of consolidation: "Note 3 – Business developments, significant shareholders and subsequent events"	 400 – 402 288
Main features of regulatory capital instruments and TLAC-eligible instruments [Table CCA]	Refer to "Capital instruments" under credit-suisse.com/regulatorydisclosures [1]	
Macroprudential supervisor measures		
Disclosure of G-SIBs indicators [Table GSIB1]	Refer to "G-SIB Indicators" under credit-suisse.com/regulatorydisclosures [1]	
Credit risk		
General qualitative information [Table CRA]	"Credit risk"	158 – 161
Additional disclosure related to credit quality of assets [Table CRB a), b), c) and d)]	"Note 1 – Summary of significant accounting policies" "Note 19 – Loans, allowance for loan losses and credit quality"	279 – 281 300 – 306
Qualitative disclosure requirements related to credit risk mitigation techniques [Table CRC a)]: Netting	"Derivative instruments" "Note 1 – Summary of significant accounting policies" "Note 27 – Offsetting of financial assets and financial liabilities"	178 – 180 277 – 278 313 – 316
Counterparty credit risk		
Qualitative disclosure requirements [Table CCRA]	Transaction rating, credit limits and provisioning: "Credit risk" Effect of a credit rating downgrade: "Credit ratings"	158 – 161 120 – 121
Securitization		
Qualitative disclosure requirements [Table SECA]	"Note 34 – Transfers of financial assets and variable interest entities"	349 – 358
Market risk		
Qualitative disclosure requirements [Table MRA]	"Market risk" "Market risk review" "Note 1 – Summary of significant accounting policies" "Note 32 – Derivatives and hedging activities"	155 – 158 170 – 173 277 – 278 339 – 342
Leverage metrics		
Qualitative disclosures [Table LR2]	"Leverage metrics" "Swiss metrics"	134 135 – 136
Liquidity coverage ratio		
Liquidity risk management [Table LIQA]	"Liquidity and funding management"	114 – 121
Liquidity Coverage Ratio [Table LIQ1]	Qualitative disclosures: "Liquidity metrics"	116 – 117
Corporate Governance		
Corporate Governance [Appendix 5]	"Corporate Governance"	188 – 230
Remuneration		
Remuneration policy [Table REMA]	"Compensation"	232 – 263
Remuneration awarded during the financial year [table REM1] / Special payments [table REM2] / Deferred remuneration [table REM3]	Senior management: "Executive Board compensation for 2018" Other material risk takers: "Group compensation"	241 – 250 255 – 263
Operational risk		
Qualitative disclosures [Table ORA]	"Operational risk regulatory capital measurement"	165
Special duties of disclosure for systemically important financial institutions and stand-alone banks		
List and qualification of alleviations granted [Appendix 4]	"FINMA Decrees"	124

1 The disclosure will be available by the end of April 2019.

Swiss capital requirements

FINMA requires the Group to fully comply with the special requirements for systemically important financial institutions operating internationally. The following tables show the Swiss capital and leverage requirements and metrics as required by FINMA.

→ Refer to "Swiss requirements" (pages 123 to 126) and "Swiss metrics" (pages 135 to 136) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Capital management – Regulatory framework in the Credit Suisse Annual Report 2018 for further information on general Swiss requirements and the related metrics.

Swiss capital requirements and metrics

		Phase-in		Look-through
end of 4Q18	CHF million	in % of RWA	CHF million	in % of RWA
Swiss risk-weighted assets				
Swiss risk-weighted assets	285,193	–	285,193	–
Risk-based capital requirements (going-concern) based on Swiss capital ratios				
Total	37,439	13.128	41,547	14.568
of which CET1: minimum	15,400	5.4	12,834	4.5
of which CET1: buffer	11,579	4.06	15,686	5.5
of which CET1: countercyclical buffers	763	0.268	763	0.268
of which additional tier 1: minimum	7,415	2.6	9,982	3.5
of which additional tier 1: buffer	2,282	0.8	2,282	0.8
Swiss eligible capital (going-concern)				
Swiss CET1 capital and additional tier 1 capital [1]	49,443	17.337	45,935	16.107
of which CET1 capital [2]	35,719	12.525	35,719	12.525
of which additional tier 1 high-trigger capital instruments	5,615	1.969	5,615	1.969
of which additional tier 1 low-trigger capital instruments [3]	4,601	1.613	4,601	1.613
of which tier 2 low-trigger capital instruments [4]	3,508	1.23	–	–
Risk-based requirement for additional total loss-absorbing capacity (gone-concern) based on Swiss capital ratios				
Total according to size and market share (going-concern requirements)	25,382 [5]	8.9 [5]	40,783	14.3
Reductions due to rebates in accordance with article 133 of the CAO	(4,061)	(1.424)	(6,525)	(2.288)
Reductions due to the holding of additional instruments in the form of convertible capital in accordance with Art. 132 para 4 CAO	0	0.0	(1,754)	(0.615)
Total, net	21,321	7.476	32,504	11.397
Eligible additional total loss-absorbing capacity (gone-concern)				
Total	35,678	12.51	37,909	13.292
of which tier 2 low-trigger capital instruments	509	0.178	4,017	1.409
of which non-Basel III-compliant tier 2 capital	1,277 [6]	0.448	–	–
of which bail-in instruments	33,892	11.884	33,892	11.884

Rounding differences may occur.

1 Excludes tier 1 capital which is used to fulfill gone-concern requirements.

2 Excludes CET1 capital which is used to fulfill gone-concern requirements.

3 If issued before July 1, 2016, such capital instruments qualify as additional tier 1 high-trigger capital instruments until their first call date according to the transitional Swiss "Too Big to Fail" rules.

4 If issued before July 1, 2016, such capital instruments qualify as additional tier 1 high-trigger capital instruments no later than December 31, 2019 according to the transitional Swiss "Too Big to Fail" rules.

5 Consists of a base requirement of 8.18%, or CHF 23,329 million, and a surcharge of 0.72%, or CHF 2,053 million.

6 Non-Basel III-compliant tier 1/2 capital instruments are subject to phase-out requirements. The amount includes the amortization component of CHF 586 million and the unamortized component of CHF 691 million.

Swiss leverage requirements and metrics

end of 4Q18	Phase-in CHF million	Phase-in in % of LRD	Look-through CHF million	Look-through in % of LRD
Leverage exposure				
Leverage ratio denominator	881,386	–	881,386	–
Unweighted capital requirements (going-concern) based on Swiss leverage ratio				
Total	35,255	4.0	44,070	5.0
of which CET1: minimum	16,746	1.9	13,221	1.5
of which CET1: buffer	8,814	1.0	17,628	2.0
of which additional tier 1: minimum	9,695	1.1	13,221	1.5
Swiss eligible capital (going-concern)				
Swiss CET1 capital and additional tier 1 capital [1]	49,443	5.610	45,935	5.212
of which CET1 capital [2]	35,719	4.053	35,719	4.053
of which additional tier 1 high-trigger capital instruments	5,615	0.637	5,615	0.637
of which additional tier 1 low-trigger capital instruments [3]	4,601	0.522	4,601	0.522
of which tier 2 low-trigger capital instruments [4]	3,508	0.398	–	–
Unweighted requirements for additional total loss-absorbing capacity (gone-concern) based on Swiss leverage ratio				
Total according to size and market share (going-concern requirements)	26,442 [5]	3.0 [5]	44,069	5.0
Reductions due to rebates in accordance with article 133 of the CAO	(4,231)	(0.48)	(7,051)	(0.8)
Reductions due to the holding of additional instruments in the form of convertible capital in accordance with Art. 132 para 4 CAO	0	0.0	(1,754)	(0.199)
Total, net	22,211	2.52	35,264	4.001
Eligible additional total loss-absorbing capacity (gone-concern)				
Total	35,678	4.048	37,909	4.301
of which tier 2 low-trigger capital instruments	509	0.058	4,017	0.456
of which non-Basel III-compliant tier 2 capital	1,277 [6]	0.145	–	–
of which bail-in instruments	33,892	3.845	33,892	3.845

Rounding differences may occur.

1 Excludes tier 1 capital which is used to fulfill gone-concern requirements.

2 Excludes CET1 capital which is used to fulfill gone-concern requirements.

3 If issued before July 1, 2016, such capital instruments qualify as additional tier 1 high-trigger capital instruments until their first call date according to the transitional Swiss "Too Big to Fail" rules.

4 If issued before July 1, 2016, such capital instruments qualify as additional tier 1 high-trigger capital instruments no later than December 31, 2019 according to the transitional Swiss "Too Big to Fail" rules.

5 Consists of a base requirement of 2.75%, or CHF 24,238 million, and a surcharge of 0.25%, or CHF 2,204 million.

6 Non-Basel III-compliant tier 1/2 capital instruments are subject to phase-out requirements. The amount includes the amortization component of CHF 586 million and the unamortized component of CHF 691 million.

Overview of risk management

General

Fundamental to our business is the prudent taking of risk in line with our strategic priorities. The primary objectives of risk management are to protect our financial strength and reputation, while ensuring that capital is well deployed to support business activities. Our risk management framework is based on transparency, management accountability and independent oversight. Risk management is an integral part of our business planning process with strong involvement of senior management and the Board of Directors. Risk measurement models are reviewed by the Model Risk Management team, an independent validation function, and regularly presented to and approved by the relevant oversight committee.

→ Refer to "Risk management oversight" (pages 143 to 147), "Risk appetite framework" (pages 147 to 150) and "Risk coverage and management" (pages 150 to 180) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management in the Credit Suisse Annual Report 2018 for information on risk management oversight including risk culture, risk governance, risk organization, risk types, risk appetite, risk limits, stress testing and strategies/processes to manage, hedge and mitigate risks.

Risk reporting

Risk reporting is performed regularly and there are numerous internal control procedures in place, in particular the standard operating procedures, risk and control assessment and independent report review. These ensure the reporting and measurement systems are up to date and are working as intended. They cover: validation and authorization of risk measurement data, status summary reports, data reconciliation, independent checks/validation and error reports to capture any failings. Senior management and the Board of Directors are informed about key risk metrics, including Value-at-Risk (VaR), Economic Risk Capital (ERC), key risks and top exposures with the monthly Group Risk Report.

Key risks

The Group is exposed to several key banking risks such as:

- Credit risk (refer to section "Credit risk" on pages 12 to 43);
- Counterparty credit risk (refer to section "Counterparty credit risk" on pages 44 to 53);
- Securitization risk (refer to section "Securitization risk" on pages 54 to 59);
- Market risk (refer to section "Market risk" on pages 60 to 63);
- Interest rate risk in the banking book (refer to section "Interest rate risk in the banking book" on pages 64 to 65); and
- Operational risk.

→ Refer to "Operational risk regulatory capital measurement" (page 165) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk coverage and management in the Credit Suisse Annual Report 2018 for information on operational risk.

The Basel framework describes a range of options for determining the capital requirements in order to provide banks and supervisors the ability to select approaches that are most appropriate for their operations and their financial market infrastructure. In general, Credit Suisse has adopted the most advanced approaches, which align with the way risk is internally managed and provide the greatest risk sensitivity.

Risk-weighted assets

With the adoption of the revised FINMA circular RWA presented in this report, including prior period comparisons, are based on the Swiss capital requirements.

→ Refer to "Swiss requirements" (pages 123 to 126) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Capital management – Regulatory framework in the Credit Suisse Annual Report 2018 for further information on Swiss capital requirements.

The following table provides an overview of total Swiss RWA forming the denominator of the risk-based capital requirements. Further breakdowns of RWA are presented in subsequent parts of this report.

RWA increased slightly to CHF 285.2 billion as of the end of 4Q18 compared to CHF 277.2 billion as of the end of 3Q18, mainly resulting from increases relating to movements in risk levels in credit risk, model and parameter updates in market risk and credit risk and methodology and policy changes in credit risk. These increases were partially offset by decreases relating to movements in risk levels in market risk and operational risk.

RWA flow statements for credit risk, counterparty credit risk and market risk are presented in subsequent parts of this report.

→ Refer to "Risk-weighted assets" (pages 131 to 133) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Capital management in the Credit Suisse Annual Report 2018 for further information on risk-weighted assets movements in 2018.

OV1 – Overview of Swiss risk-weighted assets and capital requirements

	Risk-weighted assets			Capital requirement [1]
end of	**4Q18**	3Q18	4Q17	**4Q18**
CHF million				
Credit risk (excluding counterparty credit risk)	139,867	132,489	121,832	11,189
of which standardized approach (SA)	13,190	13,519	10,511	1,055
of which supervisory slotting approach	2,403	2,349	2,187	192
of which internal rating-based (IRB) approach [2]	124,274	116,621	109,134	9,942
Counterparty credit risk	17,613	18,472	19,117	1,409
of which standardized approach for counterparty credit risk (SA-CCR) [3]	2,469	2,533	2,390	198
of which internal model method (IMM) [4]	15,144	15,939	16,727	1,211
Credit valuation adjustments (CVA)	5,743	5,029	5,548	460
Equity positions in the banking book under the simple risk weight approach [2]	8,378	8,022	8,712	670
Settlement risk	259	242	150	21
Securitization exposures in the banking book	12,541	11,951	10,731 [5]	1,003
of which securitization internal ratings-based approach (SEC-IRBA)	6,915	6,664	–	553
of which securitization external ratings-based approach (SEC-ERBA), including internal assessment approach (IAA)	1,727	1,752	–	138
of which securitization standardized approach (SEC-SA)	3,899	3,535	–	312
Market risk	18,643	17,878	21,290	1,491
of which standardized approach (SA)	2,393	2,345	3,765	191
of which internal model approach (IMA)	16,250	15,533	17,525	1,300
Operational risk	71,040	72,012	75,013	5,683
of which advanced measurement approach (AMA)	71,040	72,012	75,013	5,683
Amounts below the thresholds for deduction (subject to 250% risk weight)	11,109	11,101	11,043	889
Floor adjustment [6]	0	0	0	0
Total	**285,193**	**277,196**	**273,436**	**22,815**

1 Calculated as 8% of risk-weighted assets based on total capital minimum requirements excluding capital conservation buffer and G-SIB buffer requirements.

2 As of the end of 4Q18, a RWA scaling factor of 1.06 under the IRB approach has been applied to some additional portfolios. Prior period numbers have been restated to conform to the current presentation.

3 Calculated under the current exposure method.

4 Includes RWA relating to central counterparties.

5 In January 2018, a new securitization framework was implemented and has been phased in over 2018. The 4Q17 number was calculated in accordance with the previous methodology.

6 Credit Suisse is not subject to a floor adjustment because current capital requirements and deductions exceed 80% of those under Basel I.

Linkages between financial statements and regulatory exposures

This section shows the various sources of differences between the carrying values presented in the Group's financial statements prepared in accordance with accounting principles generally accepted in the US (US GAAP) and the exposure amounts used for regulatory purposes. The identification, classification and presentation of these sources of differences requires a significant amount of management judgement and is based on the information available at the time. As such, reclassifications have been made compared to the prior year. Management believes that the estimates and assumptions used in the preparation of these disclosures are prudent, reasonable and consistently applied.

The following table shows the differences between the scope of accounting consolidation and the scope of regulatory consolidation, broken down by how the amounts reported in the Group's financial statements correspond to regulatory risk categories.

LI1 – Differences between accounting and regulatory scopes of consolidation and mapping of financial statements with regulatory risk categories

	Carrying values		Carrying values of items subject to:				
end of 4Q18	Published financial statements	Regulatory scope of consolidation	Credit risk framework	Counterparty credit risk framework	Securitization framework	Market risk framework	Not subject to capital requirements or subject to deduction from capital
Assets (CHF million)							
Cash and due from banks	100,047	99,827	98,057	263	328	0	1,179
Interest-bearing deposits with banks	1,142	1,461	1,139	0	0	0	322
Central bank funds sold, securities purchased under resale agreements and securities borrowing transactions	117,095	117,095	0	115,534	0	88,913	0
Securities received as collateral, at fair value	41,696	41,696	0	41,696	0	0	0
Trading assets, at fair value [1]	132,203	126,936	9,337	18,943	1,154	122,859	1,644
Investment securities	2,911	1,479	1,471	0	8	0	0
Other investments	4,890	4,971	2,046	0	1,212	414	1,299
Net loans	287,581	288,215	268,940	0	18,039	1,291	0
Premises and equipment	4,838	4,904	4,904	0	0	0	0
Goodwill	4,766	4,770	0	0	0	0	4,770
Other intangible assets	219	219	25	0	0	0	194
Brokerage receivables	38,907	38,907	2,041	28,976	0	18,234	7,890
Other assets	32,621	31,843	11,991	8,200	1,197	3,781	6,674
Total assets	**768,916**	**762,323**	**399,951**	**213,612**	**21,938**	**235,492**	**23,972**
Liabilities (CHF million)							
Due to banks	15,220	16,032	0	0	0	0	16,032
Customer deposits	363,925	363,828	0	0	0	994	362,834
Central bank funds purchased, securities sold under repurchase agreements and securities lending transactions	24,623	30,277	0	24,546	0	17,519	5,731
Obligation to return securities received as collateral, at fair value	41,696	41,696	0	41,696	0	0	0
Trading liabilities, at fair value [1]	42,169	42,212	0	15,603	0	42,212	19,098
Short-term borrowings	21,926	16,536	0	0	0	16,437	99
Long-term debt	154,308	152,058	0	0	0	94,183	57,875
Brokerage payables	30,923	30,923	0	22,660	0	21,879	8,263
Other liabilities	30,107	24,635	0	7,498	0	514	17,137
Total liabilities	**724,897**	**718,197**	**0**	**112,003**	**0**	**193,738**	**487,069**

1 There are items in the table which attract capital charges according to more than one risk category framework. As an example, derivatives assets/liabilities held in the regulatory trading book are shown in the column about market risk and in the column about counterparty credit risk.

LI1 – Differences between accounting and regulatory scopes of consolidation and mapping of financial statements with regulatory risk categories (continued)

	Carrying values		Carrying values of items subject to:				
end of 4Q17	Published financial statements	Regulatory scope of consolidation	Credit risk framework	Counterparty credit risk framework	Securitization framework	Market risk framework	Not subject to capital requirements or subject to deduction from capital
Assets (CHF million)							
Cash and due from banks	109,815	109,457	107,477	239	0	0	1,768
Interest-bearing deposits with banks	726	1,146	723	0	0	0	423
Central bank funds sold, securities purchased under resale agreements and securities borrowing transactions	115,346	108,325	0	108,325	0	0	0
Securities received as collateral, at fair value	38,074	38,074	0	38,008	0	0	66
Trading assets, at fair value [1]	156,334	150,812	9,139	19,327	1,127	139,150	290
Investment securities	2,191	1,810	1,766	0	19	0	25
Other investments	5,964	5,799	3,160	105	441	867	1,226
Net loans	279,149	279,859	258,135	0	20,508	1,391	0
Premises and equipment	4,686	4,752	4,752	0	0	0	0
Goodwill	4,742	4,747	0	0	0	0	4,747
Other intangible assets	223	223	1	0	0	0	222
Brokerage receivables	46,968	46,968	2,686	28,546	0	29,869	12,911
Other assets	32,071	31,167	10,204	6,137	837	11,007	8,642
Total assets	**796,289**	**783,139**	**398,043**	**200,687**	**22,932**	**182,284**	**30,320**
Liabilities (CHF million)							
Due to banks	15,413	16,004	0	0	0	0	16,004
Customer deposits	361,162	361,255	0	0	0	0	361,255
Central bank funds purchased, securities sold under repurchase agreements and securities lending transactions	26,496	26,496	0	26,554	0	0	0
Obligation to return securities received as collateral, at fair value	38,074	38,074	0	38,008	0	0	66
Trading liabilities, at fair value [1]	39,119	39,161	0	12,568	0	39,161	0
Short-term borrowings	25,889	19,293	0	0	0	11,010	8,283
Long-term debt	173,032	171,989	0	0	0	51,464	120,525
Brokerage payables	43,303	43,303	0	26,728	0	0	16,575
Other liabilities	31,612	25,451	412	8,670	0	0	16,369
Total liabilities	**754,100**	**741,026**	**412**	**112,528**	**0**	**101,635**	**539,077**

1 There are items in the table which attract capital charges according to more than one risk category framework. As an example, derivatives assets/liabilities held in the regulatory trading book are shown in the column about market risk and in the column about counterparty credit risk.

For financial reporting purposes, our consolidation principles comply with US GAAP. For capital adequacy reporting purposes, however, entities that are not active in banking and finance are not subject to consolidation (i.e. insurance, commercial and certain real estate companies). Also, FINMA does not require consolidating private equity and other fund type vehicles for capital adequacy reporting. Further differences in consolidation principles between US GAAP and capital adequacy reporting relate to special purpose entities (SPEs) that are consolidated under a control-based approach for US GAAP but are assessed under a risk-based approach for capital adequacy reporting. In addition, FINMA requires us to consolidate companies which form an economic unit with Credit Suisse or if Credit Suisse is obliged to provide compulsory financial support to a company. The investments into such entities, which are not material to the Group, are treated in accordance with the regulatory rules and are either subject to a risk-weighted capital requirement or a deduction from regulatory capital.

All significant equity method investments represent investments in the capital of banking, financial and insurance (BFI) entities and are subject to a threshold calculation in accordance with the Basel framework and the Swiss Capital Adequacy Ordinance.

→ Refer to "Note 40 – Significant subsidiaries and equity method investments" (pages 400 to 402) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for a list of significant subsidiaries and associated entities.

In addition to the differences between accounting and regulatory scopes of consolidation as shown in table LI1 there are further main sources of differences between the financial statements' carrying value amounts and the exposure amounts used for regulatory purposes.

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

			Items subject to:	
end of	Credit risk frame-work	Counter-party credit risk frame-work	Securiti-zation frame-work	Market risk frame-work
4Q18 (CHF million)				
Asset carrying value amount under regulatory scope of consolidation	399,951	213,612	21,938	235,492
Liabilities carrying value amount under regulatory scope of consolidation	0	112,003	0	193,738
Total net amount under regulatory scope of consolidation	399,951	101,609	21,938	41,754
Off-balance sheet amounts	67,244	0	29,130	0
Differences due to consideration of provisions	(69)	0	0	0
Differences due to application of potential future exposures (SA-CCR)	0	3,298	0	0
Derivative transactions – differences due to application of internal model method (IMM)	0	(22,444)	0	0
Other differences not classified above	(809)	65	(2,902)	(39,361)
Exposure amounts considered for regulatory purposes	**466,317**	**82,528**	**48,166**	**2,393**
4Q17 (CHF million)				
Asset carrying value amount under regulatory scope of consolidation	398,043	200,687	22,932	182,284
Liabilities carrying value amount under regulatory scope of consolidation	412	112,528	0	101,635
Total net amount under regulatory scope of consolidation	397,631	88,159	22,932	80,649
Off-balance sheet amounts	64,143	0	20,158	0
Differences due to application of potential future exposures (SA-CCR)	0	2,529	0	0
Derivative transactions – differences due to application of internal model method (IMM)	0	13,552	0	0
SFT – differences due to application of internal model method (IMM)	0	(10,852)	0	0
Other differences not classified above	5,232	0	(1,925)	(76,884)
Exposure amounts considered for regulatory purposes	**467,006**	**93,388**	**41,165**	**3,765**

→ Refer to "Comparison of the standardized and internal model approaches" (pages 19 to 23) in Credit risk – Credit risk under the standardized approach for further information on the origins of differences between carrying values and amounts considered for regulatory purposes shown in the table above.

Valuation process

The Basel capital adequacy framework and the Swiss regulation provide guidance for systems and controls, valuation methodologies and valuation adjustments and reserves to provide prudent and reliable valuation estimates.

Financial instruments in the trading book are carried at fair value. The fair value of the majority of these financial instruments is marked to market based on quoted prices in active markets or observable inputs. Additionally, the Group holds financial instruments which are marked to models where the determination of fair values requires subjective assessment and varying degrees of judgment depending on liquidity, concentration, pricing assumptions and the risks affecting the specific instrument.

Control processes are applied to ensure that the reported fair values of the financial instruments, including those derived from pricing models, are appropriate and determined on a reasonable basis. These control processes include approval of new instruments, timely review of profit and loss, risk monitoring, price verification procedures and validation of models used to estimate the fair value. These functions are managed by senior management and personnel with relevant expertise, independent of the trading and investment functions.

In particular, the price verification function is performed by Product Control, independent from the trading and investment functions, reporting directly to the Chief Financial Officer, a member of the Executive Board.

The valuation process is governed by separate policies and procedures. To arrive at fair values, the following type of valuation adjustments are typically considered and regularly assessed for appropriateness: model, parameter, credit and exit-risk-related adjustments.

Management believes it complies with the relevant valuation guidance and that the estimates and assumptions used in valuation of financial instruments are prudent, reasonable and consistently applied.

→ Refer to "Fair valuations" (page 70) in II – Operating and financial review – Credit Suisse – Other information, to "Fair value" (page 107) in II – Operating and financial review – Critical accounting estimates and to "Note 35 – Financial instruments" (pages 359 to 363) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on fair value.

Credit risk

General

This section covers credit risk as defined by the Basel framework. Counterparty credit risk, including those that are in the banking book for regulatory purposes, and all positions subject to the securitization framework are presented in separate sections.

→ Refer to "Counterparty credit risk" (pages 44 to 53) for further information on the capital requirements relating to counterparty credit risk.

→ Refer to "Securitization" (pages 54 to 59) for further information on the securitization framework.

The Basel framework permits banks to choose between two broad methodologies in calculating their capital requirements for credit risk: the standardized approach or the internal ratings-based (IRB) approach. Off-balance-sheet items are converted into credit exposure equivalents through the use of credit conversion factors (CCF).

The reported credit risk arises from the execution of the groups business strategy through the divisions, and is predominantly driven by cash and balances with central banks, loans and commitments provided to corporate and institutional clients, and loans to private clients including residential mortgages and lending against financial collateral.

Risk management objectives and policies for credit risk

→ Refer to "Credit risk" (pages 158 to 161) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk coverage and management in the Credit Suisse Annual Report 2018 for information on risk management objectives and policies for credit risk, including our credit risk profile, the setting of credit risk limits, the structure and organization of credit risk management.

Credit risk reporting

Credit risk is subject to daily monitoring and reporting, and is governed by internal policies & procedures and a framework of limits and controls. The groups credit risk exposure is subject to formal monthly reporting through the Group Risk Report which provides summary information in relation to the credit risk portfolio composition, rating profile, and the largest single name loans and commitments. The Group Risk Report also provides qualitative commentary on key credit risk matters and developments, and is discussed at Board of Directors Risk Committee and distributed to the Board of Directors and Executive Board members.

Credit quality of assets

The amounts shown in the following tables are US GAAP carrying values according to the regulatory scope of consolidation that are subject to the credit risk framework.

The following tables present a breakdown of exposures by geographical areas, industry and residual maturity.

CRB – Geographic concentration of gross credit exposures

end of	Switzerland	Americas	Asia Pacific	EMEA	**Total**
4Q18 (CHF million)					
Loans, deposits with banks and other assets	193,418	61,706	41,011	97,926	394,061
Guarantees and commitments	81,016	70,178	23,779	95,100	270,073
Sub-total	**274,434**	**131,884**	**64,790**	**193,026**	**664,134**
Non-counterparty related risks					5,247
Total					**669,381**
4Q17 (CHF million)					
Loans, deposits with banks and other assets	199,628	56,732	40,841	96,626	393,827
Guarantees and commitments	76,171	68,824	21,295	98,181	264,471
Sub-total	**275,799**	**125,556**	**62,136**	**194,807**	**658,298**
Non-counterparty related risks					5,273
Total					**663,571**

The geographic distribution is based on the country of incorporation or the nationality of the counterparty, shown pre-substitution.

CRB – Industry concentration of gross credit exposures

end of	Financial institutions	Commercial	Consumer	Public authorities	**Total**
4Q18 (CHF million)					
Loans, deposits with banks and other assets	13,822	137,841	143,625	98,773	394,061
Guarantees and commitments	5,268	194,060	66,419	4,326	270,073
Sub-total	**19,090**	**331,901**	**210,044**	**103,099**	**664,134**
Non-counterparty related risks					5,247
Total					**669,381**
4Q17 (CHF million)					
Loans, deposits with banks and other assets	10,133	130,877	141,236	111,581	393,827
Guarantees and commitments	10,058	184,385	65,853	4,175	264,471
Sub-total	**20,191**	**315,262**	**207,089**	**115,756**	**658,298**
Non-counterparty related risks					5,273
Total					**663,571**

Exposures are shown pre-substitution.

CRB – Remaining contractual maturity of gross credit exposures

end of	within 1 year [1]	within 1-5 years	Thereafter	**Total**
4Q18 (CHF million)				
Loans, deposits with banks and other assets	168,266	174,337	51,458	394,061
Guarantees and commitments	198,280	64,387	7,406	270,073
Sub-total	**366,546**	**238,724**	**58,864**	**664,134**
Non-counterparty related risks				5,247
Total				**669,381**
4Q17 (CHF million)				
Loans, deposits with banks and other assets	175,155	168,315	50,357	393,827
Guarantees and commitments	188,490	66,979	9,002	264,471
Sub-total	**363,645**	**235,294**	**59,359**	**658,298**
Non-counterparty related risks				5,273
Total				**663,571**

1 Includes positions without agreed residual contractual maturity.

The following tables show the amounts of impaired exposures and related allowances and write-offs, broken down by geographical areas and industry.

CRB – Geographic concentration of allowances, impaired loans and write-offs

end of	Allowances individually evaluated for impairment	Allowances collectively evaluated for impairment	**Total allowances**	Impaired loans with specific allowances	Impaired loans without specific allowances	**Total impaired loans**	**Gross write-offs**
4Q18 (CHF million)							
Switzerland	475	180	655	1,046	710	1,756	221
EMEA	70	26	96	179	120	299	3
Americas	19	61	80	30	15	45	24
Asia Pacific	44	33	77	98	0	98	32
Total	**608**	**300**	**908**	**1,353**	**845**	**2,198**	**280**
4Q17 (CHF million)							
Switzerland	492	158	650	1,349	398	1,747	215
EMEA	62	16	78	165	43	208	0
Americas	48	39	87	75	2	77	95
Asia Pacific	52	16	68	87	0	87	1
Total	**654**	**229**	**883**	**1,676**	**443**	**2,119**	**311**

CRB – Industry concentration of allowances, impaired loans and write-offs

end of	Allowances individually evaluated for impairment	Allowances collectively evaluated for impairment	**Total allowances**	Impaired loans with specific allowances	Impaired loans without specific allowances	**Total impaired loans**	**Gross write-offs**
4Q18 (CHF million)							
Financial institutions	50	29	79	86	0	86	0
Commercial	412	224	636	736	693	1,429	184
Consumer	146	47	193	531	152	683	96
Total	**608**	**300**	**908**	**1,353**	**845**	**2,198**	**280**
4Q17 (CHF million)							
Financial institutions	37	17	54	46	0	46	0
Commercial	438	166	604	1,084	348	1,432	244
Consumer	179	46	225	545	95	640	67
Public authorities	0	0	0	1	0	1	0
Total	**654**	**229**	**883**	**1,676**	**443**	**2,119**	**311**

The following table provides a comprehensive picture of the credit quality of the Group's on and off-balance sheet assets.

CR1 – Credit quality of assets

end of	Defaulted exposures	Non-defaulted exposures	**Gross exposures**	Allowances/ impairments	**Net exposures**
4Q18 (CHF million)					
Loans [1]	3,127	365,192	368,319	(863)	367,456
Debt securities	9	15,330	15,339	0	15,339
Off-balance sheet exposures [2]	96	102,080	102,176	(160)	102,016
Total	**3,232**	**482,602**	**485,834**	**(1,023)**	**484,811**
2Q18 (CHF million)					
Loans [1]	2,685	378,552	381,237	(911)	380,326
Debt securities	10	14,806	14,816	0	14,816
Off-balance sheet exposures [2]	82	107,779	107,861	(142)	107,719
Total	**2,777**	**501,137**	**503,914**	**(1,053)**	**502,861**

1 Loans include cash and due from banks.
2 Revocable loan commitments which are excluded from the disclosed exposures can attract risk-weighted assets.

The definitions of "past due" and "impaired" are aligned between accounting and regulatory purposes. However, there are some exemptions for impaired positions related to troubled debt restructurings where the default definition is different for accounting and regulatory purposes.

→ Refer to "Note 1 – Summary of significant accounting policies" (pages 279 to 281), "Note 19 – Loans, allowance for loan losses and credit quality" (pages 300 to 306) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on the credit quality of loans including past due and impaired loans.

The following table presents the changes in the Group's stock of defaulted loans, debt securities and off-balance sheet exposures, the flows between non-defaulted and defaulted exposure categories and reductions in the stock of defaulted exposures due to write-offs.

CR2 – Changes in stock of defaulted exposures

2H18	
CHF million	
Defaulted exposures at beginning of period	**2,777**
Exposures that have defaulted since the last reporting period	904
Returned to non-defaulted status	(523)
Amounts written-off	(131)
Other changes	205
Defaulted exposures at end of period	**3,232**

The following table shows the aging analysis of accounting past-due exposures.

CRB – Aging analysis of accounting past-due exposures

	Current	Past due				
end of		Up to 30 days	31–60 days	61–90 days	More than 90 days	Total	**Total**
4Q18 (CHF million)							
Financial institutions	12,871	107	19	3	45	174	13,045
Commercial	104,361	461	101	83	861	1,506	105,867
Consumer	153,107	528	65	45	519	1,157	154,264
Public authorities	1,173	13	0	0	0	13	1,186
Gross loans held at amortized cost	**271,512**	**1,109**	**185**	**131**	**1,425**	**2,850**	**274,362**
Gross loans held at fair value							14,873
Gross loans							**289,235**
4Q17 (CHF million)							
Financial institutions	8,935	335	2	2	44	383	9,318
Commercial	100,836	484	54	216	593	1,347	102,183
Consumer	151,699	504	79	58	469	1,110	152,809
Public authorities	1,198	1	0	0	1	2	1,200
Gross loans held at amortized cost	**262,668**	**1,324**	**135**	**276**	**1,107**	**2,842**	**265,510**
Gross loans held at fair value							15,307
Gross loans							**280,817**

Loans that are modified in a troubled debt restructuring are reported as restructured loans. Generally, restructured loans would have been considered impaired and an associated allowance for loan losses would have been established prior to the restructuring. As of December 31, 2018, CHF 189 million were reported as restructured loans.

→ Refer to "Note 19 – Loans, allowance for loan losses and credit quality" (page 306) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on restructured exposure.

Credit risk mitigation

Credit Suisse actively mitigates credit exposure through use of legal netting agreements, security over supporting financial and non-financial collateral or financial guarantees, and through the use of credit hedging techniques (primarily credit default swaps (CDS)). The recognition of credit risk mitigation (CRM) against exposures is governed by a robust set of policies and processes that ensure enforceability and effectiveness.

Netting

→ Refer to "Derivative instruments" (pages 178 to 180) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk review and results and to "Note 1 – Summary of significant accounting policies" (pages 277 to 278) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for information on policies and procedures for on- and off-balance sheet netting.

→ Refer to "Note 27 – Offsetting of financial assets and financial liabilities" (pages 313 to 316) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on the offsetting of derivatives, reverse repurchase and repurchase agreements, and securities lending and borrowing transactions.

Collateral valuation and management

The policies and processes for collateral valuation and management are driven by:

- a legal document framework that is bilaterally agreed with our clients;
- a collateral management risk framework enforcing transparency through self-assessment and management reporting; and
- any prevailing regulatory terms which must be complied with.

For exposures collateralized by financial collateral (e.g. marketable securities), collateral valuations are performed on a daily basis and any requirement for additional collateral (e.g. frequency and process for margin calls) is governed by the legal documentation. The market prices used for daily collateral valuation are a combination of internal pricing sources, as well as market prices sourced from trading platforms and external service providers where appropriate.

For exposures collateralized by non-financial collateral (e.g. real estate, ships, aircraft), valuations are performed at the time of credit approval and periodically thereafter depending on the type of collateral and the loan-to-value (LTV) ratio in accordance with documented internal policies and controls. Valuations are based on a combination of internal and external reference price sources.

Primary types of collateral

The primary types of collateral are described below.
Collateral securing foreign exchange transactions and over-the-counter (OTC) trading activities primarily includes:

- Cash and US Treasury instruments; and
- G-10 government securities.

Collateral securing loan transactions primarily includes:

- Financial collateral pledged against loans collateralized by securities of clients of the private, corporate and institutional banking businesses (primarily cash and marketable securities);
- Real estate property for mortgages, mainly residential, but also multi-family buildings, offices and commercial properties; and
- Other types of lending collateral, such as accounts receivable, inventory, plant and equipment.

Concentrations within risk mitigation

Credit Suisse, primarily through its Global Markets division, is an active participant in the credit derivatives market and trades with a variety of market participants, principally commercial and investment banks. Credit derivatives are primarily used to mitigate investment grade credit exposures. Where required or practicable, these trades are cleared through central counterparties (CCP), reducing the potential risk against individual CRM providers.

As a result of a strong domestic franchise, Credit Suisse has a significant volume of residential mortgage lending in Switzerland and a resultant concentration of residential real estate collateral. Credit Suisse has clear underwriting standards with regard to mortgage lending and ensures that the composition of the real estate portfolio is subject to ongoing monitoring, periodic revaluation, and assessment of the geographical and borrower composition of the portfolio.

Credit Suisse provides loan facilities to private clients against financial collateral such as cash and marketable securities (e.g. equities, bonds, or funds). The financial collateral portfolio within risk mitigation is generally diversified and the portfolio is subject to ongoing monitoring and reporting to identify any concentrations. which may result in lower LTV ratios or other mitigating actions.

→ Refer to "Credit risk review" (pages 178 to 180) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk review and results in the Credit Suisse Annual Report 2018 for further information on credit derivatives, including a breakdown by rating class.

CRM techniques – overview

The following table presents the extent of use of CRM techniques.

CR3 – CRM techniques

	Net exposures			Exposures secured by		
end of	Unsecured	Partially or fully secured	**Total**	Collateral	Financial guarantees	Credit derivatives
4Q18 (CHF million)						
Loans [1]	142,286	225,170	367,456	189,518	6,676	216
Debt securities	15,148	191	15,339	191	0	0
Total	**157,434**	**225,361**	**382,795**	**189,709**	**6,676**	**216**
of which defaulted	1,154	1,544	**2,698**	1,137	162	0
2Q18 (CHF million)						
Loans [1]	152,054	228,272	380,326	193,468	5,299	264
Debt securities	14,633	183	14,816	183	0	0
Total	**166,687**	**228,455**	**395,142**	**193,651**	**5,299**	**264**
of which defaulted	1,028	1,163	**2,191**	876	122	0

Excludes non-financial collateral which is used to reduce the capital requirements for investment banking businesses, and therefore the net exposures are classified as unsecured.
1 Loans include cash and due from banks.

Credit risk under the standardized approach

General

Under the standardized approach, risk weights are determined either according to credit ratings provided by recognized external credit assessment institutions (ECAI) or, for unrated exposures, by using the applicable regulatory risk weights. Less than 10% of our credit risk exposures are determined using the standardized approach.

Credit risk exposure and CRM effects

The following table illustrates the effect of CRM (comprehensive and simple approach) on the standardized approach capital requirements' calculations. RWA density provides a synthetic metric on riskiness of each portfolio.

CR4 – Credit risk exposure and CRM effects

	Exposures pre-CCF and CRM			Exposures post-CCF and CRM				
end of	On-balance sheet	Off-balance sheet	**Total**	On-balance sheet	Off-balance sheet	**Total**	RWA	RWA density
4Q18 (CHF million, except where indicated)								
Sovereigns	14,083	0	14,083	14,083	0	14,083	301	2%
Institutions – Banks and securities dealer	453	526	979	453	263	716	143	20%
Corporates	714	0	714	714	0	714	639	89%
Retail	1,037	114	1,151	1,037	114	1,151	1,052	91%
Other exposures	12,290	2,125	14,415	12,269	2,121	14,390	11,055	77%
of which non-counterparty related assets	5,247	0	5,247	5,247	0	5,247	5,247	100%
Total	**28,577**	**2,765**	**31,342**	**28,556**	**2,498**	**31,054**	**13,190**	**42%**
2Q18 (CHF million, except where indicated)								
Sovereigns	14,373	0	14,373	14,373	0	14,373	279	2%
Institutions – Banks and securities dealer	175	544	719	175	272	447	92	20%
Corporates	1,017	0	1,017	1,017	0	1,017	940	92%
Retail	329	79	408	329	79	408	355	87%
Other exposures	12,356	1,877	14,233	12,329	1,876	14,205	11,212	79%
of which non-counterparty related assets	5,273	0	5,273	5,273	0	5,273	5,273	100%
Total	**28,250**	**2,500**	**30,750**	**28,223**	**2,227**	**30,450**	**12,878**	**42%**

Exposures by asset classes and risk weights

The following table presents the breakdown of credit exposures under the standardized approach by asset class and risk weight, which correspond to the riskiness attributed to the exposure according to the standardized approach.

CR5 – Exposures by asset classes and risk weights

	Risk weight									
end of	0%	10%	20%	35%	50%	75%	100%	150%	Others	Exposures post-CCF and CRM
4Q18 (CHF million)										
Sovereigns	13,142	0	572	0	365	0	4	0	0	14,083
Institutions – Banks and securities dealer	0	0	716	0	0	0	0	0	0	716
Corporates	0	0	33	0	97	0	584	0	0	714
Retail	0	0	0	0	0	395	756	0	0	1,151
Other exposures	3,366	0	1	0	0	0	11,012	0	11	14,390
of which non-counterparty related assets	0	0	0	0	0	0	5,247	0	0	5,247
Total	**16,508**	**0**	**1,322**	**0**	**462**	**395**	**12,356**	**0**	**11**	**31,054**
2Q18 (CHF million)										
Sovereigns	13,485	0	556	0	328	0	4	0	0	14,373
Institutions – Banks and securities dealer	0	0	444	0	0	0	3	0	0	447
Corporates	0	0	44	0	82	0	891	0	0	1,017
Retail	0	0	0	0	0	213	195	0	0	408
Other exposures	3,023	0	3	0	0	0	11,168	0	11	14,205
of which non-counterparty related assets	0	0	0	0	0	0	5,273	0	0	5,273
Total	**16,508**	**–**	**1,047**	**0**	**410**	**213**	**12,261**	**0**	**11**	**30,450**

Comparison of the standardized and internal model approaches

Background

We have regulatory approval to use a number of internal models for calculating our Pillar 1 capital charge for credit risk (default risk). These include the advanced-internal ratings-based (A-IRB) approach for risk weights, Internal Models Method (IMM) for derivatives credit exposure, and repo VaR for Securities Financing Transactions (SFT). These modelled based approaches are used for the vast majority of credit risk exposures, with the standardized approaches used for only a relatively small proportion of credit exposures.

Regulators and investors are increasingly interested in the differences between capital requirements under modelled and standardized approaches. This is due, in part, to ongoing and future regulatory changes by the BCBS, such as the new standardized approaches for counterparty credit risk (SA-CCR) and credit risk as well as the restrictions on the use of internal models for certain portfolios in 2022. As such, FINMA requires us to disclose further information on differences between credit risk RWA computed under internal modelled approaches, and current standardized approaches. FINMA also requires us to disclose the differences between the exposure at default based on internal modelled approaches and the exposure at default (EAD) used in the Leverage ratio.

Key methodological differences

The differences between credit risk RWA calculated under the internal modelled approaches and the standardized approaches are driven by the risk weights applied to counterparties and the calculations used for measuring EAD.

Risk weights: Under the A-IRB approach, the maturity of a transaction, and internal estimates of the probability of default (PD) and downturn loss given default (LGD) are used as inputs to the Basel risk-weight formula for calculating RWA. In the standardized approach, risk weights are less granular and are driven by ratings provided by ECAI.

EAD calculations: Under the IMM and repo VaR methods, counterparty exposure is computed using monte-carlo simulation models or VaR models. These models allow for the recognition of netting impacts at exposure and collateral levels for each counterparty portfolio. The standardized approach is based on market values at the balance sheet date plus conservative add-ons to account for potential market movements. This approach gives very limited recognition to netting benefits and portfolio effects.

The following table provides a summary of the key conceptual differences between the internal models approach and the current standardized approach.

Key differences between the standardized approach and the internal model approach

	Standardized approach	Internal model approach	Key impact
EAD for derivatives	Current Exposure Method is simplistic (market value and add-on): BCBS to replace it with SA-CCR in 2020.	Internal Models Method (IMM) allows Monte-Carlo simulation to estimate exposure.	For large diversified derivatives portfolios, standardized EAD is higher than model EAD.
	No differentiation between margined and unmargined transactions.	Ability to net and offset risk factors within the portfolio (i.e. diversification).	Impact applies across all asset classes.
	Differentiates add-ons by five exposure types and three maturity buckets only.	Application of multiplier on IMM exposure estimate.	
	Limited ability to net.	Variability in holding period applied to collateralized transactions, reflecting liquidity risks.	
Risk weighting	Reliance on ECAIs: where no rating is available a 100% risk weight is applied (i.e. for most small and medium size enterprises and funds).	Reliance on internal ratings where each counterparty/transaction receives a rating.	Model approach produces lower RWA for high quality short-term transactions.
	Crude risk weight differentiation with 4 key weights: 20%, 50%, 100%, 150% (and 0% for AAA sovereigns; 35%, 75% or 100% for mortgages; 75% or 100% for retail).	Granular risk sensitive risk weights differentiation via individual PDs and LGDs.	Standardized approach produces lower RWA for non-investment grade and long-term transactions.
	No differentiation for transaction features.	LGD captures transaction quality features incl. collateralization.	Impact relevant across all asset classes.
		Application of a 1.06 scaling factor.	
Risk mitigation	Limited recognition of risk mitigation.	Risk mitigation recognized via risk sensitive LGD or EAD.	Standardized approach RWA higher than model approach RWA for most collaterals.
	Restricted list of eligible collateral.	Wider variety of collateral types eligible.	Impact particularly relevant for lombard lending and securities financing transactions.
	Conservative and crude regulatory haircuts.	Repo VaR allows use of VaR models to estimate exposure and collateral for securities financing transactions. Approach permits full diversification and netting across all collateral types.	
Maturity in risk weight	No differentiation for maturity of transactions, except for interbank exposures in a coarse manner.	No internal modelling of maturity.	Model approach produces lower RWA for high quality short-term transactions.
		Regulatory risk-weighted assets function considers maturity: the longer the maturity the higher the risk weight (see chart "Risk weight by maturity").	

The following chart shows standardized risk weights, and model based (A-IRB) risk weights for loans of varying maturity. The graphs are plotted for a AA-rated corporate senior unsecured loan with a LGD of 45% (consistent with Foundation-IRB, F-IRB), and a AA-rated corporate senior secured loan with a LGD of 36%. The graphs show that standardized risk weights are not sensitive to maturity, whereas A-IRB risk weights are sensitive to maturity. In particular, under A-IRB, lower maturity loans receive lower risk weights reflecting an increased likelihood of repayment for loans with a shorter maturity.

Risk weight by maturity

Key methodological differences between internally modelled EAD and EAD used in leverage ratio

The exposure measure used in the leverage ratio also differs from the exposure measure used in the internal modelled approach. The main methodological difference is that leverage ratio exposure estimates do not take into account physical or financial collateral, guarantees or other CRM techniques to reduce the credit risk. Leverage ratio exposures also do not fully reflect netting and portfolio diversification. As a result, leverage ratio exposures are typically larger than model based exposures.

The following table shows the internal model-based EAD, along with average risk weight, compared to an estimate of the exposure measure used in the leverage ratio calculation. Estimates are provided at Basel asset class level. As expected, leverage exposure measures exceed internal model-based EAD, with the largest differences for banks and corporates, where the impacts of netting, diversification, and CRM are largest.

Leverage exposure estimate

	Internal model approach		
	EAD	Risk weight	Leverage exposures [1]
Basel asset class (CHF billion, except where indicated)			
Corporates	186	52%	333
Banks	31	27%	81
Sovereigns	87	4%	80
Retail	194	16%	192

1 The leverage exposure estimate excludes trading book inventory, as credit risk capital for this business is capitalized under the market risk capital requirement. In addition, the estimate does not include Multilateral Development Banks (MDB), public sector entities and non-credit exposures. Asset class leverage ratio based exposures and standard approach calculations are approximate and provided on a best efforts basis.

It should be noted that credit risk capital requirements based of the internal model based approach are not directly comparable to capital requirements under the leverage ratio. The reason for this is that the 3% leverage ratio capital requirement can be met with total tier 1 capital, including capital for market risk and operational risk.

Risk-weighted assets under the standardized and internal model approaches

Credit risk RWA computed under the standardized approach are higher than those based on the internal models for which we have received regulatory approval. Higher risk-weights under the standardized approach rules are a material driver of the higher RWA for all Basel asset classes. The standardized exposure calculations also lead to some higher RWA, with the corporate and bank asset classes being most significantly affected.

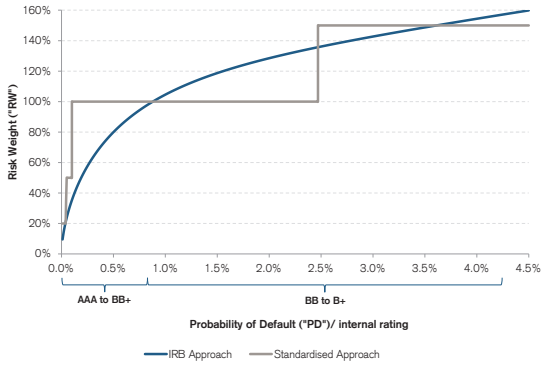
Corporate asset class

The table "Leverage ratio estimate" shows that the EAD for corporates computed under the internal model approach is CHF 186 billion. The EAD for corporates under the standardized approach is significantly higher. This difference is driven mainly by the standardized exposure calculations for OTC derivatives and secured financing transactions. For these products, exposures calculated under the standardized approach are higher than the model based exposures because the standardized approach does not fully recognize the benefits of netting, portfolio diversification and collateral. The exposure calculated under the leverage ratio is higher than the EAD computed using internal models. This is because CRM, netting and portfolio diversification are not reflected in the leverage ratio exposure calculation.

Another significant driver of the increase in credit risk RWA under the standardized approach is higher risk weights. The exposure weighted-average risk weight under the internal model approach is 52%. This is significantly lower than the risk weights assigned to corporates under the standardized approach.

The following graph shows the risk weights assigned to counterparties under the A-IRB approach and the standardized approach. For the IRB risk weight curve, an LGD value of 45% and a maturity adjustment of 2.5 years are chosen, as these are the Basel Foundation IRB parameters. For counterparties in the AAA to BB+ range (based on external ratings), higher risk weights (20%, 50% and 100%) are assigned under the standardized approach than under the A-IRB approach. For the corporate asset class, approximately three-quarters of the Group's exposures are in this range (based on internal ratings), and this is a key driver for the higher RWA under the standardized approach. The different treatments of loan maturity in the model based approach and standardized approach are not a material cause of RWA differences.

Corporates



The Group's exposure weighted-average maturity of its corporate portfolio is lower than the foundation IRB value of 2.5 years, and lower maturities would result in a lower model-based risk weight curve than shown in the graph. In addition, the PD for each rating shown in the graph are consistent with the Group's PD masterscale.

An additional driver of higher risk weights within the corporate asset class are counterparties without an external rating. Under the standardized approach, counterparties without an external rating receive a fixed risk weight of 100%. This applies to a large proportion of the Group's exposures, among them non-banking financial institutions and specialized lending. This fixed standardized risk weight is typically higher than the model based risk weight with for example, the average model based risk weight of specialized lending being approximately 40%.

→ Refer to "CR6 – Credit exposures by portfolio and PD range" (pages 28 to 35) for further information on EAD and risk weights for each credit rating for the corporate asset class.

Bank asset class

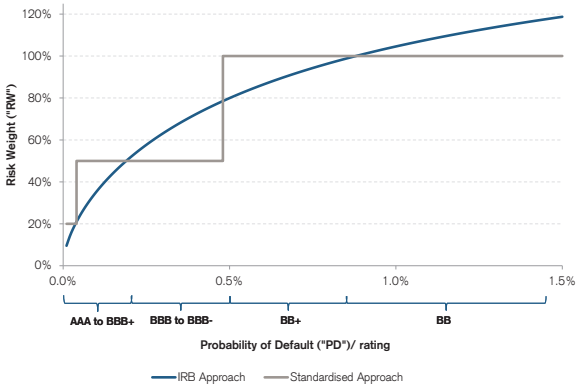
The table "Leverage ratio estimate" shows that the EAD for banks under the internal model approach is CHF 31 billion. The EAD for banks calculated under the standardized approach is significantly higher. This is driven predominantly by the exposure calculations for both OTC derivatives and secured financing transactions and, to a lesser extent, the exposure calculations for listed and centrally cleared derivatives. For these products, exposures calculated under the standardized approach are much higher than the model based exposures because the standardized approach does not fully recognize the benefits of netting, portfolio diversification and collateral. The exposures calculated under the leverage ratio are significantly higher than the EAD computed using internal models. This is because CRM, netting and portfolio diversification are not reflected in the leverage ratio exposure calculation.

In addition, there is a significant increase in credit risk RWA under the standardized approach due to higher credit risk-weights. The exposure weighted-average risk-weight under the internal model approach is 27%. This is significantly lower than the risk weights assigned to banks under the standardized approach where a significant amount of the Group's exposures would attract a risk weight of 50%.

The following graph shows the risk weights assigned to counterparties under the A-IRB approach and the standardized approach. For the IRB risk weight curve, an LGD value of 45% and a maturity adjustment of 2.5 years are chosen, as these are the Basel Foundation IRB parameters. The graph shows that counterparties in the AAA to BBB+ range (based on external ratings) attract higher risk weights (20% and 50%) under the standardized approach than under the A-IRB approach. In excess of three-quarters of the Group's exposures fall in this range (based on internal ratings) and this leads to higher RWA under the standardized approach for these counterparties. The different treatments of loan maturity in the model based approach and standardized approach are not a material cause of RWA differences.

→ Refer to "CR6 – Credit exposures by portfolio and PD range" (pages 28 to 35) for further information on EAD and risk weights for each credit rating for the bank asset class.

Banks



The Group's exposure weighted-average maturity of its bank portfolio is lower than the foundation IRB value of 2.5 years, and lower maturities would result in a lower model based risk weight curve than shown in the graph. In addition, the PD for each rating shown in the graph are consistent with the Group's PD masterscale.

Sovereign asset class

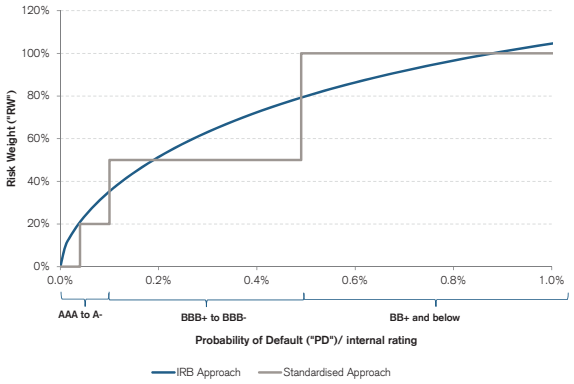
The table "Leverage ratio estimate" shows that the EAD for sovereigns under the internal model approach is CHF 87 billion. This is comparable to the EAD calculated under the standardized approach and the leverage ratio exposure. This is because the majority of the sovereign exposure is in the form of uncollateralized loans, i.e. there are no material differences in the exposure calculation.

The impact of employing standardized credit risk weights to the sovereign portfolio is an overall increase in credit risk RWA. The exposure weighted-average risk weight under the internal model approach is less than 4%. This is lower than the risk weights assigned to counterparties under the standardized approach.

The following graph shows the risk weights assigned to counterparties under the A-IRB approach and the standardized approach. For the IRB risk weight curve, an LGD value of 45% and a maturity adjustment of 2.5 years are chosen, as these are the Basel Foundation IRB parameters. The graph shows that counterparties in the AAA to A range (based on external ratings) would attract lower risk weights (0% and 20%) under the standardized approach than under the A-IRB approach. The majority of the Group's exposures have extremely low risk-weights under the A-IRB approach and would attract risk weights of 0% under the standardized approach. The remaining exposures would receive higher risk weights under the standardized approach (20%, 50% or 100%) than under the A-IRB approach. Overall, this would lead to higher RWA under the standardized approach. The different treatments of loan maturity in the model based approach and standardized approach are not a material cause of RWA differences.

→ Refer to "CR6 – Credit exposures by portfolio and PD range" (pages 28 to 35) for further information on EAD and risk weights for each credit rating for the sovereign asset class.

Sovereigns



The Group's exposure weighted-average maturity of its sovereign portfolio is lower than the foundation IRB value of 2.5 years, and lower maturities would result in a lower model-based risk weight curve than shown in the following graph. In addition, the PD for each rating shown in the graph are consistent with the Group's PD masterscale.

Retail asset class

The EAD of the retail asset class under the internal model approach is CHF 194 billion, which is comparable to the EAD calculated under the standardized approach and the leverage ratio. This is because the majority of retail exposure is on-balance sheet exposure.

The application of the standardized approach would lead to higher credit risk RWA. The exposure weighted-average risk weight is 16% using internal model approach. This is lower than the risk weights assigned to counterparties under the standardized approach. The maturity of the loan has no impact on the modelled risk weights in the retail asset class.

The retail portfolio consists mainly of residential mortgage loans, lombard lending and other retail exposures, and further analysis for each of these portfolios is provided below:

Residential mortgages: Under the standardized approach, fixed risk weights are applied depending on the LTV, i.e. risk weight of 100% for LTV > 80%, risk weight of 75% for 80% > LTV > 67% and risk weight of 35% for LTV < 67%. The internal model-based approach however takes into account borrowers' ability to service debt more accurately, including mortgage affordability and calibration to large amounts of historic data. The Group's residential mortgage portfolio is focused on the Swiss market and the Group has robust review processes over borrowers' ability to repay. This results in the Group's residential mortgage portfolio having a low average LTV and results in an average risk weight of 17% under the A-IRB approach.

Lombard lending: For lombard lending, the average risk weight using internal models is 12%. RWA under the standardized approach and the model-based approach are comparable for these exposures.

Other retail exposures: Other retail exposures are risk-weighted at 75% or 100% under the standardized approach. This yields higher RWA compared to the A-IRB approach where the average risk-weight is 39%.

Conclusion

Overall, the Group's credit risk RWA would be significantly higher under the standardized approach than under the internal model based approach. For most Basel asset classes, this is due to standardized risk weights being much higher than the IRB risk weights for high quality investment grade lending, which is where the majority of the Group's exposures are. For certain asset classes, standardized exposure calculations also lead to significantly higher RWA. This is where the standardized exposure methods give limited recognition to economic offsetting and diversification for derivatives and SFTs at a portfolio level.

The credit risk RWA under the standardized approaches described above is not reflective of the capital charges under the new standardized approach for credit risk on which the BCBS published new rules in December 2017. This new standardized approach for credit risk is more risk sensitive and employs a different approach for incorporating external ratings. In addition, there is a new standardized approach for counterparty credit risk (SA-CCR), which prescribes a standardized calculation of EAD for derivative transactions. SA-CCR, which is to be implemented by 2020, will more accurately recognize the risk mitigating effect of collateral and the benefits from legal and economic offsetting. These regulatory changes could potentially lead to very different results to the ones described above.

The credit risk RWA computed under the internal model-based approach provide a more risk-sensitive indication of the credit risk capital requirements and are more reflective of the economic risk of the Group. The use of models produces a strong link between capital requirements and business drivers, and promotes a proactive risk culture at the origination of a transaction and strong capital consciousness within the organization. A rigorous monitoring and control framework also ensures compliance with internal as well as regulatory standards.

Credit risk under internal risk-based approaches

General

Under the IRB approach, risk weights are determined by using internal risk parameters and applying an asset value correlation multiplier uplift where exposures are to financial institutions meeting regulatory defined criteria. We have received approval from FINMA to use, and have fully implemented, the A-IRB approach whereby we provide our own estimates for PD, LGD and EAD.

PD parameters capture the risk of a counterparty defaulting over a one-year time horizon. PD estimates are mainly derived from models tailored to the specific business of the respective obligor. The models are calibrated to the long run average of annual internal or external default rates where applicable. For portfolios with a small number of empirical defaults, low default portfolio techniques are used.

LGD parameters consider seniority, collateral, counterparty industry and in certain cases fair value markdowns. LGD estimates are mainly based on an empirical analysis of historical loss rates. To reflect time value of money, recovered amounts on defaulted obligations are discounted to the time of default and to account for potential adverse outcomes in a downturn environment, final parameters are chosen such as they reflect periods where economic downturns have been observed and/or where increased losses manifested. For portfolios with low amount of statistical values available conservative values are chosen based on proxy analysis and expert judgement. For much of the private, corporate and institutional banking businesses loan portfolio, the LGD is primarily dependent upon the type and amount of collateral pledged. The credit approval and collateral monitoring process are based on LTV limits. For mortgages (residential or commercial), recovery rates are differentiated by type of property.

EAD is either derived from balance sheet values or by using models. EAD for a non-defaulted facility is an estimate of the expected exposure upon default of the obligor. Estimates are derived based on a CCF approach using default-weighted averages of historical realized conversion factors on defaulted loans by facility type. Estimates are calibrated to capture negative operating environment effects. To comply with regulatory guidance in deriving individual observed CCF values as basis for the estimation are floored at zero, i.e. it is assumed that drawn exposure can never become lower in the run to default.

→ Refer to "Credit risk" (pages 158 to 161) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk coverage and management in the Credit Suisse Annual Report 2018 for further information on PD and LGD.

Risk weights are calculated using either the PD/LGD approach or the supervisory risk weights approach for certain types of specialized lending.

Reporting related to credit risk models

→ Refer to "Model validation" (pages 25 to 26), "Use of internal ratings" (page 27) and "Credit Risk Review" (page 27) for further information on the scope and main content of the reporting related to credit risk models.

Rating models

The majority of the credit rating models used in Credit Suisse are developed internally by Credit Analytics, a specialized unit in Credit Risk Management. These models are independently validated by Model Risk Management team prior to use in the Basel III regulatory capital calculation, and thereafter on a regular basis. Credit Suisse also uses models purchased from recognized data and model providers (e.g. credit rating agencies). These models are owned by Credit Analytics and are validated internally and follow the same governance process as models developed internally.

All new or material changes to rating models are subject to a robust governance process. Post development and validation of a rating model or model change, the model is taken through a number of committees where model developers, validators and users of the models discuss the technical and regulatory aspects of the model. The relevant committees opine on the information provided and decide to either approve or reject the model or model change. The ultimate decision making committee is the Risk Processes & Standards Committee (RPSC). The responsible Executive Board Member for the RPSC is the Chief Risk Officer. The RPSC sub-group responsible for credit risk models is the Credit Methodology Steering Committee (CMSC). RPSC or CMSC also review and monitor the continued use of existing models on an annual basis.

The following table provides an overview of the main PD and LGD models used by Credit Suisse. It reflects the portfolio segmentation from a credit risk model point of view, showing the RWA, type and number of the most significant models, and the loss period available for model development by portfolio. As the table follows an internal risk segmentation and captures the most significant models only, these figures do not match regulatory asset class or other A-IRB based segmentation.

Some of the portfolios shown in the table sum up multiple rating models. The distinction criteria determining which model applies, differs from portfolio to portfolio. Corporates, banks and non-banking financial institutions are split by turnover and geography. For funds, the distinction criteria is the different form of funds e.g. mutual-, hedge-funds etc., whereas for income producing real estate (IPRE), it is corporate vs. private counterparties. The distinction criteria for Sovereign is global governments vs. Swiss Canton vs. local governments (e.g. cities).

CRE – Main PD and LGD models used by Credit Suisse

				PD		LGD	
Portfolio	Asset class	Risk-weighted assets (in CHF billion)	Number of years loss data	No. of models	Model comment	No. of models	Model comment
Corporates	Corporates, retail	46	>15 years	2	Statistical scorecards using e.g. balance sheet, profit & loss data and qualitative factors	3	Statistical and hybrid models using e.g. industry and counterparty segmentation, collateral types and amounts, seniority and other transaction specific factors with granularity enhancements by public research and expert judgement
Banks and other financial institutions	Banks, corporates	9	>30 years	5	Statistical scorecard and constrained expert judgement using e.g. balance sheet, profit & loss data and qualitative factors		
Funds	Corporates	10	>10 years	5	Statistical scorecards using e.g. net asset value, volatility of returns and qualitative factors		
Residential mortgages	Retail	11	>10 years	1	Statistical scorecard using e.g. LTV, affordability, assets and qualitative factors	1	Statistical model using e.g. counterparty segmentation, collateral types and amounts
Income producing real estate	Specialized lending, retail	18	>10 years	2	Statistical scorecards using e.g. LTV, debt service coverage and qualitative factors		
Commodity traders	Corporates, specialized lending	3	>10 years	1	Statistical scorecard using e.g. volume, liquidity and duration of financed commodity transactions		
Sovereign	Sovereign, corporates	3	>10 years	1	Statistical scorecards using e.g. GDP, financials and qualitative factors	1	Statistical models using e.g. industry and counterparty segmentation, seniority and other transaction specific factors
Ship finance	Specialized lending	3	>10 years	1	Simulation model using e.g. freight rates, time charter agreements, operational expenses and debt service coverage	1	Simulation model using e.g. freight rates, time charter agreements, operational expenses and debt service coverage
Lombard, Securities Borrowing & Lending	Retail	15	>10 years	1	Merton type model using e.g. LTV, collateral volatility and counterparty attributes	1	Merton type model using e.g. LTV, collateral volatility and counterparty attributes

Model development

The techniques to develop models are carefully selected by Credit Analytics to meet industry standards in the banking industry as well as regulatory requirements. The models are developed to exhibit "through-the-cycle" characteristics, reflecting a PD in a 12 month period across the credit cycle.

All models have clearly defined model owners who have primary responsibility for development, enhancement, review, maintenance and documentation. The models have to pass statistical performance tests, where feasible, followed by usability tests by designated Credit Risk Management experts to proceed to formal approval and implementation. The development process of a new model is thoroughly documented and foresees a separate schedule for model updates.

The level of calibration of the models is based on a range of inputs, including internal and external benchmarks where available. Additionally, the calibration process ensures that the estimated calibration level accounts for variations of default rates through the economic cycle and that the underlying data contains a representative mix of economic states. Conservatism is incorporated in the model development process to compensate for any known or suspected limitations and uncertainties.

Model validation

Model validation for risk capital models is performed by the Model Risk Management function. Model governance is subject to clear and objective internal standards as outlined in the Model Risk Management policy and the Model Validation Policy. The governance framework ensures a consistent and meaningful approach for the validation of models in scope across the bank. All models whose outputs fall into the scope of the Basel internal model framework are subject to full independent validation. Externally developed models are subject to the same governance and validation standards as internal models.

The governance process requires each in scope model to be validated and approved before go-live; the same process is followed for material changes to an existing model. Existing models are subject to an ongoing governance process which requires each model to be periodically validated and the performance to be monitored annually. The validation process is a comprehensive quantitative and qualitative assessment with goals that include:

- to confirm that the model remains conceptually sound and the model design is suitable for its intended purpose;
- to verify that the assumptions are still valid and weaknesses and limitations are known and mitigated;
- to determine that the model outputs are accurate compared to realized outcome;

- to establish whether the model is accepted by the users and used as intended with appropriate data governance;
- to check whether a model is implemented correctly;
- to ensure that the model is fully transparent and sufficiently documented.

To meet these goals, models are validated against a series of quantitative and qualitative criteria. Quantitative analyses may include a review of model performance (comparison of model output against realized outcome), calibration accuracy against the longest time series available, assessment of a model's ability to rank order risk and performance against available benchmarks. Qualitative assessment typically includes a review of the appropriateness of the key model assumptions, the identification of the model limitations and their mitigation, and ensuring appropriate model use. The modeling approach is re-assessed in light of developments in the academic literature and industry practice.

Results and conclusions are presented to senior risk management including the RPSC; shortcomings and required improvements identified during validation must be remediated within an agreed deadline. The Model Risk Management function is independent of model developers and users and has the final say on the content of each validation report.

Model governance at Credit Suisse follows the "three lines of defense" principle. Model developers and owners provide the first line of defense, Model Risk Management the second line, and Internal Audit the third line of defense. Organization independence ensures that these functions are able to provide appropriate oversight. For Credit Risk models, the development and validation functions are independent up to the Chief Risk Officer (Executive Board level). Internal Audit has fully independent reporting into the Chair of the Board of Directors Audit Committee.

Stress testing of parameters

The potential biases in PD estimates in unusual market conditions are accounted for by the use of long run average estimates. Credit Suisse additionally uses stress-testing when back-testing PD models. When predefined thresholds are breached during back-testing, a review of the calibration level is undertaken. For LGD/CCF calibration stress testing is applied in defining Downturn LGD/CCF values, reflecting potentially increased losses during stressed periods.

Descriptions of the rating processes

All counterparties that Credit Suisse is exposed to are assigned an internal credit rating. The rating is assigned at the time of initial credit approval and subsequently reviewed and updated regularly. Where available, Credit Risk Management employs rating models relative to the counterparty type that incorporate qualitative and quantitative factors. Expert judgement may further be applied through a well governed model override process in the assignment of a credit rating or PD, which measures the counterparty's risk of default over a one-year period.

Corporates (excluding corporates managed on the Swiss platform), banks and sovereigns (primarily in the investment banking businesses)

Where used, rating models are an integral part of the rating process. To ensure all relevant information is considered when rating a counterparty, experienced credit officers complement the outputs from the models with other relevant information not otherwise captured via a robust model-override framework. Other relevant information may include, but is not limited to peer analysis, industry comparisons, external ratings and research and the judgment of credit experts. This analysis emphasizes a forward looking approach, concentrating on economic trends and financial fundamentals. Where rating models are not used the assignment of credit ratings is based on a well-established expert judgment based process which captures key factors specific to the type of counterparty.

For structured and asset finance deals, the approach is more quantitative. The focus is on the performance of the underlying assets, which represent the collateral of the deal. The ultimate rating is dependent upon the expected performance of the underlying assets and the level of credit enhancement of the specific transaction. Additionally, a review of the originator and/or servicer is performed. External ratings and research (rating agency and/or fixed income and equity), where available, are incorporated into the rating justification, as is any available market information (e.g., bond spreads, equity performance).

Transaction ratings are based on the analysis and evaluation of both quantitative and qualitative factors. The specific factors analyzed include seniority, industry and collateral.

Corporates managed on the Swiss platform, mortgages and other retail (primarily in the private, corporate and institutional banking businesses)

For corporates managed on the Swiss platform and mortgage lending, the PD is calculated directly by proprietary statistical rating models, which are based on internally compiled data comprising both quantitative factors (primarily LTV ratio and the borrower's income level for mortgage lending and balance sheet information for corporates) and qualitative factors (e.g., credit histories from credit reporting bureaus, management quality). In this case, an equivalent rating is assigned for reporting purposes, based on the PD band associated with each rating. Collateral loans (margin lending), which form the largest part of "Other retail", is also following an individual PD and LGD approach. This approach is already rolled out for loans booked on the Swiss platform and for the majority of international locations; the remaining international locations follow a pool PD and pool LGD approach. Both approaches are calibrated to historical loss experience. Most of the collateral loans are loans collateralized by securities.

The internal rating grades are mapped to the Credit Suisse Internal Masterscale. The PDs assigned to each rating grade are reflected in the following table.

CRE – Credit Suisse counterparty ratings

Ratings	PD bands (%)	Definition	S&P	Fitch	Moody's	Details
AAA	0.000 – 0.021	Substantially risk free	AAA	AAA	Aaa	Extremely low risk, very high long-term stability, still solvent under extreme conditions
AA+ AA AA-	0.021 – 0.027 0.027 – 0.034 0.034 – 0.044	Minimal risk	AA+ AA AA-	AA+ AA AA-	Aa1 Aa2 Aa3	Very low risk, long-term stability, repayment sources sufficient under lasting adverse conditions, extremely high medium-term stability
A+ A A-	0.044 – 0.056 0.056 – 0.068 0.068 – 0.097	Modest risk	A+ A A-	A+ A A-	A1 A2 A3	Low risk, short- and mid-term stability, small adverse developments can be absorbed long term, short- and mid-term solvency preserved in the event of serious difficulties
BBB+ BBB BBB-	0.097 – 0.167 0.167 – 0.285 0.285 – 0.487	Average risk	BBB+ BBB BBB-	BBB+ BBB BBB-	Baa1 Baa2 Baa3	Medium to low risk, high short-term stability, adequate substance for medium-term survival, very stable short term
BB+ BB BB-	0.487 – 0.839 0.839 – 1.442 1.442 – 2.478	Acceptable risk	BB+ BB BB-	BB+ BB BB-	Ba1 Ba2 Ba3	Medium risk, only short-term stability, only capable of absorbing minor adverse developments in the medium term, stable in the short term, no increased credit risks expected within the year
B+ B B-	2.478 – 4.259 4.259 – 7.311 7.311 – 12.550	High risk	B+ B B-	B+ B B-	B1 B2 B3	Increasing risk, limited capability to absorb further unexpected negative developments
CCC+ CCC CCC- CC	12.550 – 21.543 21.543 – 100.00 21.543 – 100.00 21.543 – 100.00	Very high risk	CCC+ CCC CCC- CC	CCC+ CCC CCC- CC	Caa1 Caa2 Caa3 Ca	High risk, very limited capability to absorb further unexpected negative developments
C D1 D2	100 Risk of default has materialized	Imminent or actual loss	C D	C D	C	Substantial credit risk has materialized, i.e. counterparty is distressed and/or non-performing. Adequate specific provisions must be made as further adverse developments will result directly in credit losses.

Transactions rated C are potential problem loans; those rated D1 are non-performing assets and those rated D2 are non-interest earning.

Use of internal ratings

Internal ratings play an essential role in the decision-making and the credit approval processes. The portfolio credit quality is set in terms of the proportion of investment and non-investment grade exposures. Investment/non-investment grade is determined by the internal rating assigned to a counterparty.

Internal counterparty ratings (and associated PDs), transaction ratings (and associated LGDs) and CCF for loan commitments are inputs to RWA and ERC calculations. Model outputs are the basis for risk-adjusted-pricing or assignment of credit competency levels.

The internal ratings are also integrated into the risk management reporting infrastructure and are reviewed in senior risk management committees. These committees include the Chief Executive Officer, Chief Credit Officer (CCO), Regional CCO, RPSC and Capital Allocation & Risk Management Committee (CARMC).

Credit Risk Review

Governance and supervisory checks within credit risk management are supplemented by the credit risk review function. The credit risk review function is independent from credit risk management with a direct functional reporting line to the Risk Committee Chair, administratively reporting to the Group CRO. Credit risk review's primary responsibility is to provide timely and independent assessments of the Group's credit exposures and credit risk management processes and practices. Any findings and agreed actions are reported to senior management and, as necessary, to the Risk Committee.

EAD covered by the various approaches

The following table shows the part of EAD covered by the standardized and the A-IRB approach for each of the asset classes. The F-IRB approach is currently not applied.

CRE – EAD covered by the various approaches

end of 4Q18	Standardized approach	A-IRB approach
EAD (in %)		
Sovereigns	14	86
Institutions – Banks and securities dealer	4	96
Institutions – Other institutions	0	100
Corporates	1	99
Residential mortgages	0	100
Retail	1	99
Other exposures	100	0
Total	**7**	**93**

Credit risk exposures by portfolio and PD range

The following table shows the main parameters used for the calculation of capital requirements for IRB models.

CR6 – Credit risk exposures by portfolio and PD range

end of 4Q18	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	**Total exposures**	Average CCF
Sovereigns (CHF million, except where indicated)				
0.00% to <0.15%	81,810	509	82,319	88%
0.15% to <0.25%	92	16	108	0%
0.25% to <0.50%	530	0	530	100%
0.50% to <0.75%	32	0	32	0%
0.75% to <2.50%	44	18	62	25%
2.50% to <10.00%	1,305	5	1,310	79%
100.00% (Default)	593	0	593	0%
Sub-total	**84,406**	**548**	**84,954**	**88%**
Institutions – Banks and securities dealer				
0.00% to <0.15%	10,848	994	11,842	58%
0.15% to <0.25%	105	87	192	50%
0.25% to <0.50%	906	240	1,146	37%
0.50% to <0.75%	132	192	324	79%
0.75% to <2.50%	626	201	827	70%
2.50% to <10.00%	599	290	889	48%
10.00% to <100.00%	7	5	12	20%
100.00% (Default)	21	1	22	50%
Sub-total	**13,244**	**2,010**	**15,254**	**57%**
Institutions – Other institutions				
0.00% to <0.15%	533	2,008	2,541	92%
0.15% to <0.25%	19	15	34	100%
0.25% to <0.50%	18	1	19	85%
0.50% to <0.75%	1	0	1	50%
0.75% to <2.50%	0	1	1	100%
2.50% to <10.00%	29	137	166	100%
Sub-total	**600**	**2,162**	**2,762**	**92%**
Corporates – Specialized lending				
0.00% to <0.15%	7,198	2,210	9,408	100%
0.15% to <0.25%	5,722	2,025	7,747	96%
0.25% to <0.50%	3,252	1,470	4,722	95%
0.50% to <0.75%	4,713	3,293	8,006	76%
0.75% to <2.50%	9,558	3,173	12,731	74%
2.50% to <10.00%	1,226	232	1,458	87%
10.00% to <100.00%	100	0	100	0%
100.00% (Default)	642	16	658	89%
Sub-total	**32,411**	**12,419**	**44,830**	**87%**

1 CRM is reflected by shifting the counterparty exposure from the underlying obligor to the protection provider.
2 Reflects risk-weighted assets post CCF.

Total exposures decreased slightly compared to the end of 2Q18, primarily reflecting decreases in sovereigns and corporates without specialized lending.

	EAD post-CRM and post-CCF [1]	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA [2]	RWA density	Expected loss	Provisions
	82,440	0.02%	68	4%	1.2	1,048	1%	1	–
	92	0.22%	9	51%	3.0	59	63%	0	–
	406	0.37%	7	51%	1.4	233	57%	1	–
	32	0.64%	24	42%	4.9	34	106%	0	–
	48	1.40%	11	42%	1.0	41	87%	0	–
	358	6.45%	24	51%	2.6	713	199%	13	–
	346	100.00%	2	58%	3.8	367	106%	0	–
	83,722	**0.47%**	**145**	**5%**	**1.2**	**2,495**	**3%**	**15**	**0**
	12,870	0.06%	711	55%	0.6	2,014	16%	4	–
	320	0.22%	82	49%	1.2	153	48%	0	–
	980	0.37%	165	54%	1.4	645	66%	2	–
	226	0.60%	107	47%	0.6	166	73%	1	–
	626	1.25%	228	56%	0.8	620	99%	3	–
	487	4.92%	116	51%	0.8	764	157%	13	–
	8	16.44%	6	53%	0.2	21	255%	1	–
	22	100.00%	7	55%	1.5	23	106%	34	–
	15,539	**0.44%**	**1,422**	**54%**	**0.7**	**4,406**	**28%**	**58**	**34**
	1,079	0.04%	428	43%	1.8	156	14%	0	–
	23	0.21%	21	36%	1.9	9	40%	0	–
	19	0.36%	11	49%	2.1	13	69%	0	–
	1	0.58%	53	47%	1.2	1	72%	0	–
	1	1.03%	19	41%	1.8	0	82%	0	–
	48	5.08%	4	9%	4.9	17	36%	0	–
	1,171	**0.26%**	**536**	**42%**	**1.9**	**196**	**17%**	**0**	**0**
	8,073	0.06%	854	28%	2.1	1,603	20%	1	–
	6,608	0.22%	748	28%	2.3	2,455	37%	4	–
	3,902	0.37%	559	28%	2.1	1,872	48%	4	–
	5,839	0.58%	407	21%	2.0	2,141	37%	7	–
	10,602	1.33%	792	18%	2.7	4,784	45%	25	–
	1,315	4.59%	93	17%	3.0	776	59%	10	–
	100	14.08%	4	18%	3.7	89	89%	3	–
	559	100.00%	45	17%	2.7	593	106%	90	–
	36,998	**2.27%**	**3,502**	**24%**	**2.3**	**14,313**	**39%**	**144**	**90**

CR6 – Credit risk exposures by portfolio and PD range (continued)

end of 4Q18	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	**Total exposures**	Average CCF
Corporates without specialized lending (CHF million, except where indicated)				
0.00% to <0.15%	16,554	47,886	64,440	58%
0.15% to <0.25%	5,059	9,556	14,615	63%
0.25% to <0.50%	7,934	7,026	14,960	61%
0.50% to <0.75%	6,317	8,072	14,389	49%
0.75% to <2.50%	11,124	10,877	22,001	63%
2.50% to <10.00%	9,672	20,179	29,851	52%
10.00% to <100.00%	847	525	1,372	69%
100.00% (Default)	887	169	1,056	61%
Sub-total	**58,394**	**104,290**	**162,684**	**58%**
Residential mortgages				
0.00% to <0.15%	30,432	1,593	32,025	100%
0.15% to <0.25%	30,579	1,812	32,391	100%
0.25% to <0.50%	36,045	2,291	38,336	100%
0.50% to <0.75%	6,113	626	6,739	100%
0.75% to <2.50%	4,728	854	5,582	100%
2.50% to <10.00%	504	66	570	100%
10.00% to <100.00%	51	0	51	100%
100.00% (Default)	494	12	506	100%
Sub-total	**108,946**	**7,254**	**116,200**	**100%**
Qualifying revolving retail				
0.75% to <2.50%	443	5,584	6,027	0%
10.00% to <100.00%	94	0	94	73%
100.00% (Default)	9	0	9	0%
Sub-total	**546**	**5,584**	**6,130**	**73%**
Other retail				
0.00% to <0.15%	53,913	117,261	171,174	95%
0.15% to <0.25%	3,657	7,860	11,517	90%
0.25% to <0.50%	1,486	3,695	5,181	80%
0.50% to <0.75%	727	810	1,537	94%
0.75% to <2.50%	4,230	1,499	5,729	95%
2.50% to <10.00%	3,362	770	4,132	98%
10.00% to <100.00%	25	60	85	90%
100.00% (Default)	531	84	615	90%
Sub-total	**67,931**	**132,039**	**199,970**	**94%**
Sub-total (all portfolios)				
0.00% to <0.15%	201,288	172,461	373,749	69%
0.15% to <0.25%	45,233	21,371	66,604	76%
0.25% to <0.50%	50,171	14,723	64,894	75%
0.50% to <0.75%	18,035	12,993	31,028	60%
0.75% to <2.50%	30,753	22,207	52,960	69%
2.50% to <10.00%	16,697	21,679	38,376	55%
10.00% to <100.00%	1,124	590	1,714	70%
100.00% (Default)	3,177	282	3,459	71%
Sub-total (all portfolios)	**366,478**	**266,306**	**632,784**	**68%**
Alternative treatment				
Exposures from free deliveries applying standardized risk weights or 100% under the alternative treatment	–	–	–	–
IRB – maturity and export finance buffer	–	–	–	–
Total (all portfolios and alternative treatment)				
Total (all portfolios and alternative treatment)	**366,478**	**266,306**	**632,784**	**68%**

1 CRM is reflected by shifting the counterparty exposure from the underlying obligor to the protection provider.
2 Reflects risk-weighted assets post CCF.

	EAD post-CRM and post-CCF [1]	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA [2]	RWA density	Expected loss	Provisions
	41,471	0.07%	2,885	41%	2.4	9,591	23%	11	–
	8,447	0.21%	1,267	38%	2.5	3,603	43%	7	–
	10,688	0.37%	1,759	39%	2.6	5,896	55%	15	–
	9,200	0.62%	1,352	41%	2.3	6,415	70%	23	–
	15,490	1.51%	2,958	41%	2.5	15,304	99%	90	–
	15,192	5.54%	2,428	35%	2.8	26,759	176%	297	–
	928	17.41%	85	28%	2.6	1,835	198%	43	–
	734	100.00%	209	38%	1.9	767	104%	291	–
	102,150	**2.06%**	**12,943**	**39%**	**2.5**	**70,170**	**69%**	**777**	**309**
	31,955	0.08%	46,406	15%	2.8	2,139	7%	4	–
	31,284	0.18%	40,134	15%	2.8	3,940	13%	9	–
	37,069	0.31%	48,313	15%	2.9	6,749	18%	17	–
	5,425	0.59%	6,757	17%	2.6	1,776	33%	6	–
	4,992	1.24%	6,803	18%	2.5	2,725	55%	11	–
	509	4.42%	844	18%	2.3	575	113%	4	–
	51	17.83%	69	19%	1.9	112	219%	2	–
	478	100.00%	269	17%	1.7	507	106%	25	–
	111,763	**0.72%**	**149,595**	**15%**	**2.8**	**18,523**	**17%**	**78**	**25**
	589	1.30%	808,274	50%	1.0	146	25%	4	–
	95	25.00%	93,274	35%	0.2	100	105%	8	–
	4	100.00%	343	35%	0.2	4	106%	5	–
	688	**5.14%**	**901,891**	**48%**	**0.9**	**250**	**36%**	**17**	**5**
	62,468	0.04%	49,894	63%	1.4	5,260	8%	18	–
	4,426	0.19%	3,589	42%	1.4	753	17%	3	–
	2,038	0.36%	5,612	31%	1.4	397	19%	2	–
	890	0.61%	11,640	40%	1.3	301	34%	2	–
	4,481	1.62%	80,595	44%	2.3	2,493	56%	31	–
	3,666	5.19%	85,017	40%	2.7	2,278	62%	76	–
	38	14.02%	260	53%	1.9	39	102%	3	–
	389	100.00%	5,582	70%	1.5	412	106%	177	–
	78,396	**0.90%**	**242,189**	**58%**	**1.5**	**11,933**	**15%**	**312**	**177**
	240,356	0.05%	101,246	31%	1.7	21,811	9%	39	–
	51,200	0.19%	45,850	23%	2.6	10,972	21%	23	–
	55,102	0.33%	56,426	22%	2.7	15,805	29%	41	–
	21,613	0.60%	20,340	30%	2.2	10,834	50%	39	–
	36,829	1.43%	899,680	32%	2.5	26,113	71%	164	–
	21,575	5.40%	88,526	35%	2.7	31,882	148%	413	–
	1,220	17.63%	93,698	28%	2.4	2,196	180%	60	–
	2,532	100.00%	6,457	37%	2.2	2,673	106%	622	–
	430,427	**1.15%**	**1,312,223**	**29%**	**2.1**	**122,286**	**28%**	**1,401**	**640**
	29	–	–	–	–	16	–	–	–
	–	–	–	–	–	1,972	–	–	–
	430,456	**1.15%**	**1,312,223**	**29%**	**2.1**	**124,274**	**28%**	**1,401**	**640**

CR6 – Credit risk exposures by portfolio and PD range

end of 2Q18	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	**Total exposures**	Average CCF
Sovereigns (CHF million, except where indicated)				
0.00% to <0.15%	93,545	492	94,037	78%
0.15% to <0.25%	90	16	106	0%
0.25% to <0.50%	114	0	114	100%
0.50% to <0.75%	38	0	38	0%
0.75% to <2.50%	28	18	46	43%
2.50% to <10.00%	1,341	3	1,344	99%
10.00% to <100.00%	17	0	17	0%
100.00% (Default)	465	0	465	0%
Sub-total	**95,638**	**529**	**96,167**	**78%**
Institutions – Banks and securities dealer				
0.00% to <0.15%	9,529	1,033	10,562	58%
0.15% to <0.25%	127	136	263	50%
0.25% to <0.50%	822	366	1,188	33%
0.50% to <0.75%	92	339	431	71%
0.75% to <2.50%	1,185	355	1,540	69%
2.50% to <10.00%	187	351	538	46%
10.00% to <100.00%	6	4	10	50%
100.00% (Default)	8	1	9	50%
Sub-total	**11,956**	**2,585**	**14,541**	**58%**
Institutions – Other institutions				
0.00% to <0.15%	790	1,874	2,664	100%
0.15% to <0.25%	32	129	161	100%
0.25% to <0.50%	6	14	20	99%
0.50% to <0.75%	1	0	1	79%
0.75% to <2.50%	0	1	1	100%
2.50% to <10.00%	29	44	73	100%
10.00% to <100.00%	0	0	0	0%
100.00% (Default)	0	0	0	100%
Sub-total	**858**	**2,062**	**2,920**	**100%**
Corporates – Specialized lending				
0.00% to <0.15%	7,503	1,702	9,205	100%
0.15% to <0.25%	6,419	2,096	8,515	95%
0.25% to <0.50%	3,141	1,433	4,574	88%
0.50% to <0.75%	5,539	2,723	8,262	72%
0.75% to <2.50%	10,212	3,456	13,668	72%
2.50% to <10.00%	1,313	56	1,369	62%
10.00% to <100.00%	27	20	47	88%
100.00% (Default)	464	15	479	97%
Sub-total	**34,618**	**11,501**	**46,119**	**84%**

1 CRM is reflected by shifting the counterparty exposure from the underlying obligor to the protection provider.
2 Reflects risk-weighted assets post CCF.

	EAD post-CRM and post-CCF [1]	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA [2]	RWA density	Expected loss	Provisions
	94,326	0.02%	74	3%	1.2	930	1%	1	–
	90	0.22%	8	51%	2.9	55	62%	0	–
	114	0.37%	9	48%	1.3	61	53%	0	–
	38	0.64%	17	42%	5.0	40	105%	0	–
	34	1.16%	19	41%	1.2	27	80%	0	–
	388	6.47%	28	51%	2.7	767	197%	13	–
	17	16.44%	1	58%	1.0	49	289%	2	–
	366	100.00%	3	58%	3.6	388	106%	0	–
	95,373	**0.44%**	**159**	**4%**	**1.2**	**2,317**	**2%**	**16**	**0**
	11,652	0.06%	599	55%	0.5	1,700	15%	3	–
	396	0.22%	70	49%	1.1	184	46%	0	–
	932	0.37%	160	56%	1.3	628	67%	2	–
	221	0.61%	106	44%	0.7	150	68%	1	–
	1,293	1.17%	239	50%	0.6	1,164	90%	6	–
	131	7.34%	95	48%	1.5	259	197%	5	–
	8	17.17%	10	52%	0.5	20	257%	1	–
	9	100.00%	9	46%	2.8	9	106%	35	–
	14,642	**0.32%**	**1,288**	**54%**	**0.6**	**4,114**	**28%**	**53**	**35**
	1,189	0.05%	381	40%	2.7	213	18%	0	–
	63	0.18%	64	40%	1.5	21	33%	0	–
	13	0.37%	17	44%	1.7	7	53%	0	–
	6	0.58%	74	68%	1.1	7	118%	0	–
	0	1.02%	18	40%	1.4	0	72%	0	–
	48	5.08%	5	9%	5.1	17	36%	0	–
	0	0.00%	0	0%	0.0	0	0%	0	–
	0	100.00%	1	44%	1.0	0	106%	0	–
	1,319	**0.28%**	**560**	**39%**	**2.7**	**265**	**20%**	**0**	**0**
	8,144	0.06%	823	29%	2.2	1,590	20%	1	–
	7,374	0.21%	795	28%	2.4	2,570	35%	4	–
	3,705	0.37%	494	30%	2.1	1,843	50%	4	–
	6,430	0.58%	416	24%	2.1	2,594	40%	9	–
	11,281	1.26%	786	18%	2.8	4,747	42%	26	–
	1,329	4.31%	88	12%	3.6	568	43%	8	–
	37	17.64%	9	21%	2.8	46	125%	1	–
	471	100.00%	36	20%	1.7	499	106%	123	–
	38,771	**1.93%**	**3,447**	**24%**	**2.4**	**14,457**	**37%**	**176**	**123**

CR6 – Credit risk exposures by portfolio and PD range (continued)

end of 2Q18	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	**Total exposures**	Average CCF
Corporates without specialized lending (CHF million, except where indicated)				
0.00% to <0.15%	16,928	53,472	70,400	58%
0.15% to <0.25%	7,738	11,708	19,446	68%
0.25% to <0.50%	6,035	12,698	18,733	54%
0.50% to <0.75%	5,394	5,469	10,863	62%
0.75% to <2.50%	11,764	9,955	21,719	65%
2.50% to <10.00%	6,721	18,816	25,537	51%
10.00% to <100.00%	781	451	1,232	56%
100.00% (Default)	652	156	808	76%
Sub-total	**56,013**	**112,725**	**168,738**	**58%**
Residential mortgages				
0.00% to <0.15%	32,145	1,738	33,883	100%
0.15% to <0.25%	48,601	2,706	51,307	100%
0.25% to <0.50%	17,742	1,680	19,422	100%
0.50% to <0.75%	5,403	654	6,057	100%
0.75% to <2.50%	4,311	735	5,046	100%
2.50% to <10.00%	462	38	500	100%
10.00% to <100.00%	40	0	40	100%
100.00% (Default)	433	10	443	100%
Sub-total	**109,137**	**7,561**	**116,698**	**100%**
Qualifying revolving retail				
0.75% to <2.50%	474	5,660	6,134	0%
10.00% to <100.00%	98	0	98	50%
100.00% (Default)	3	0	3	0%
Sub-total	**575**	**5,660**	**6,235**	**50%**
Other retail				
0.00% to <0.15%	57,025	118,694	175,719	95%
0.15% to <0.25%	2,541	7,779	10,320	87%
0.25% to <0.50%	1,263	2,883	4,146	79%
0.50% to <0.75%	553	745	1,298	90%
0.75% to <2.50%	5,388	1,805	7,193	95%
2.50% to <10.00%	3,615	624	4,239	95%
10.00% to <100.00%	70	30	100	100%
100.00% (Default)	243	30	273	96%
Sub-total	**70,698**	**132,590**	**203,288**	**94%**
Sub-total (all portfolios)				
0.00% to <0.15%	217,465	179,005	396,470	68%
0.15% to <0.25%	65,548	24,570	90,118	78%
0.25% to <0.50%	29,123	19,074	48,197	62%
0.50% to <0.75%	17,020	9,930	26,950	68%
0.75% to <2.50%	33,362	21,985	55,347	69%
2.50% to <10.00%	13,668	19,932	33,600	52%
10.00% to <100.00%	1,039	505	1,544	60%
100.00% (Default)	2,268	212	2,480	82%
Sub-total (all portfolios)	**379,493**	**275,213**	**654,706**	**67%**
Alternative treatment				
Exposures from free deliveries applying standardized risk weights or 100% under the alternative treatment	–	–	–	–
IRB – maturity and export finance buffer	–	–	–	–
Total (all portfolios and alternative treatment)				
Total (all portfolios and alternative treatment)	**379,493**	**275,213**	**654,706**	**67%**

1 CRM is reflected by shifting the counterparty exposure from the underlying obligor to the protection provider.
2 Reflects risk-weighted assets post CCF.

	EAD post-CRM and post-CCF [1]	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA [2]	RWA density	Expected loss	Provisions
	44,677	0.07%	2,832	41%	2.4	9,927	22%	12	–
	11,976	0.21%	1,760	40%	2.1	4,622	39%	10	–
	10,998	0.37%	1,276	37%	2.4	5,823	53%	15	–
	7,259	0.60%	1,404	42%	2.5	5,313	73%	18	–
	15,372	1.45%	2,999	39%	2.6	14,967	97%	79	–
	11,497	5.62%	2,250	35%	2.9	20,623	179%	234	–
	842	20.03%	136	25%	2.6	1,787	212%	41	–
	736	100.00%	201	44%	2.2	780	106%	289	–
	103,357	**1.85%**	**12,858**	**40%**	**2.5**	**63,842**	**62%**	**698**	**307**
	32,246	0.08%	43,073	15%	2.9	2,051	6%	4	–
	49,713	0.20%	69,916	15%	3.0	6,487	13%	16	–
	18,309	0.35%	20,670	17%	2.8	3,723	20%	11	–
	5,537	0.58%	7,773	17%	2.7	1,720	31%	5	–
	4,495	1.22%	7,250	17%	2.6	2,308	51%	9	–
	464	4.57%	715	15%	2.3	467	101%	3	–
	41	17.67%	62	21%	1.8	89	219%	1	–
	442	100.00%	277	17%	1.7	468	106%	31	–
	111,247	**0.67%**	**149,736**	**15%**	**2.9**	**17,313**	**16%**	**80**	**31**
	502	1.30%	801,319	50%	1.0	124	25%	3	–
	98	25.00%	84,100	35%	0.2	104	105%	9	–
	3	100.00%	274	35%	0.2	3	106%	4	–
	603	**5.61%**	**885,693**	**47%**	**0.9**	**231**	**38%**	**16**	**4**
	65,786	0.04%	49,733	63%	1.4	5,340	8%	17	–
	3,354	0.19%	5,104	37%	1.2	507	15%	2	–
	1,654	0.37%	4,182	33%	1.7	352	21%	2	–
	728	0.58%	11,895	44%	1.2	262	36%	2	–
	5,678	1.63%	81,210	41%	1.9	2,950	52%	37	–
	3,756	5.08%	85,402	43%	2.7	2,622	70%	82	–
	82	16.11%	325	49%	1.7	84	103%	6	–
	183	100.00%	5,880	74%	1.7	195	106%	185	–
	81,221	**0.64%**	**243,731**	**58%**	**1.5**	**12,312**	**15%**	**333**	**183**
	258,020	0.04%	97,515	30%	1.7	21,751	8%	38	–
	72,966	0.20%	77,717	21%	2.7	14,446	20%	32	–
	35,725	0.36%	26,808	26%	2.5	12,437	35%	34	–
	20,219	0.59%	21,685	30%	2.4	10,086	50%	35	–
	38,655	1.38%	893,840	31%	2.5	26,287	68%	160	–
	17,613	5.41%	88,583	35%	2.9	25,323	144%	345	–
	1,125	19.94%	84,643	28%	2.3	2,179	194%	61	–
	2,210	100.00%	6,681	38%	2.2	2,342	106%	667	–
	446,533	**0.99%**	**1,297,472**	**29%**	**2.1**	**114,851**	**26%**	**1,372**	**683**
	113	–	–	–	–	99	–	–	–
	–	–	–	–	–	959	–	–	–
	446,646	**0.99%**	**1,297,472**	**29%**	**2.1**	**115,909**	**26%**	**1,372**	**683**

Effect of credit derivatives used as CRM techniques on risk-weighted assets

The following table shows the effect of credit derivatives used as CRM techniques on the IRB approach capital requirements' calculations.

CR7 – Effect on risk-weighted assets of credit derivatives used as CRM techniques

	4Q18		2Q18	
end of	Pre-credit derivatives RWA	Actual RWA	Pre-credit derivatives RWA	Actual RWA
CHF million				
Sovereigns – A-IRB	2,496	2,496	2,377	2,317
Institutions – Banks and securities dealers – A-IRB	4,501	4,410	4,282	4,119
Institutions – Other institutions – A-IRB	196	196	265	265
Corporates – Specialized lending – A-IRB	16,716	16,716	16,022	16,022
Corporates without specialized lending – A-IRB	71,136	70,181	65,157	63,934
Residential mortgages	18,523	18,523	17,313	17,313
Qualifying revolving retail	250	250	231	231
Other retail	11,933	11,933	12,312	12,312
Total	**125,751**	**124,705**	**117,959**	**116,513**

For exposures covered by recognized credit derivatives, the substitution approach is applied. Hence, the risk weight of the obligor is substituted with the risk-weight of the protection provider.

RWA flow statements of credit risk exposures under IRB

The following table presents the definitions of the RWA flow statements components for credit risk and CCR.

Definition of risk-weighted assets movement components related to credit risk and CCR

Description	Definition
Asset size	Represents changes arising in the ordinary course of business (including new businesses)
Asset quality/Credit quality of counterparties	Represents changes in average risk weighting across credit risk classes
Model and parameter updates	Represents movements arising from updates to models and recalibrations of parameters and internal changes impacting how exposures are treated
Methodology and policy changes	Represents movements due to methodology changes in calculations driven by regulatory policy changes, including both revisions to existing regulations and new regulations
Acquisitions and disposals	Represents changes in book sizes due to acquisitions and disposals of entities
Foreign exchange impact	Represents changes in exchange rates of the transaction currencies compared to the Swiss franc
Other	Represents changes that cannot be attributed to any other category

The following table presents the 4Q18 flow statement explaining the variations in the credit risk RWA determined under an IRB approach.

CR8 – Risk-weighted assets flow statements of credit risk exposures under IRB

4Q18	RWA
CHF million	
Risk-weighted assets at beginning of period	**118,970**
Asset size	4,477
Asset quality	366
Model and parameter updates	460
Methodology and policy changes	1,663
Foreign exchange impact	741
Risk-weighted assets at end of period	**126,677**

Credit risk RWA under IRB of CHF 126.7 billion increased CHF 7.7 billion compared to the end of 3Q18, primarily driven by increases related to asset size, mainly reflecting higher exposures, methodology and policy changes and a foreign exchange impact.

The increase in methodology and policy changes was mainly due to an additional phase-in of the multiplier on IPRE exposures and an additional phase-in of a multiplier on certain investment banking corporate exposures.

Model performance

The A-IRB models are subject to a comprehensive backtesting process to demonstrate that model performance can be confirmed annually during the entire lifecycle of each model. As evidenced during model development and confirmed via annual performance monitoring, discriminatory power and calibration of credit models typically is well above industry standard.

The following table provides backtesting data to validate the reliability of PD calculations.

CR9 – Backtesting of PD per portfolio

	Master scale from CRM S&P	Master scale from CRM Fitch	Master scale from CRM Moody	Weighted average PD
Sovereigns				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.02%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.22%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.37%
0.50% to <0.75%	BB+	BB+	Ba1	0.64%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.40%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	6.45%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	0.00%
Institutions – Banks and securities dealer				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.06%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.22%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.37%
0.50% to <0.75%	BB+	BB+	Ba1	0.60%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.25%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	4.92%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	16.44%
Institutions – Other institutions				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.04%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.21%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.36%
0.50% to <0.75%	BB+	BB+	Ba1	0.58%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.03%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	5.08%
Corporates – Specialized lending				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.06%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.22%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.37%
0.50% to <0.75%	BB+	BB+	Ba1	0.58%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.33%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	4.59%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	14.08%

1 The number of obligors used in the calculation is based on the transactional-based approach.

2 Reflects risk data where prudential portfolios are not captured and which only covers the time period until end of previous year. Accordingly for these columns approximations are required. Further, fast defaults are in tendency understated since capturing of fast defaults is not available for all clients in risk data. Underlying default rates are determined on client level, i.e. a client can have more than one transaction/credit.

	Arithmetic average PD by obligors [1]	Number of obligors: End of previous year	End of the year	Defaulted obligors in the year [2]	of which: new defaulted obligors in the year [2]	Average historical annual default rate [2]
	0.03%	71	68	0	0	0.04%
	0.21%	10	9	0	0	0.00%
	0.37%	8	7	0	0	0.00%
	0.60%	21	24	0	0	0.00%
	1.46%	20	11	0	0	0.00%
	5.71%	26	24	0	0	1.15%
	0.00%	0	0	0	0	5.94%
	0.07%	623	711	0	0	0.04%
	0.22%	85	82	0	0	0.04%
	0.37%	153	165	0	0	0.27%
	0.60%	114	107	0	0	0.13%
	1.25%	238	228	1	0	0.11%
	5.03%	102	116	2	0	0.53%
	18.63%	4	6	0	0	2.13%
	0.05%	338	428	0	0	0.00%
	0.20%	102	21	0	0	0.00%
	0.37%	26	11	0	0	0.00%
	0.58%	82	53	0	0	0.08%
	1.28%	25	19	0	0	0.00%
	4.26%	5	4	–	–	–
	0.06%	810	854	0	0	0.02%
	0.20%	816	748	0	0	0.03%
	0.37%	528	559	0	0	0.03%
	0.60%	412	407	1	0	0.19%
	1.33%	779	792	6	0	0.35%
	4.31%	122	93	13	0	4.03%
	14.85%	2	4	0	0	21.07%

CR9 – Backtesting of PD per portfolio (continued)

	Master scale from CRM S&P	Master scale from CRM Fitch	Master scale from CRM Moody	Weighted average PD
Corporates without specialized lending				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.07%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.21%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.37%
0.50% to <0.75%	BB+	BB+	Ba1	0.62%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.51%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	5.54%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	17.41%
Residential mortgages				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.08%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.18%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.31%
0.50% to <0.75%	BB+	BB+	Ba1	0.59%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.24%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	4.42%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	17.83%
Qualifying revolving retail				
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.30%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	25.00%
Other retail				
0.00% to <0.15%	AAA to BBB+	AAA to BBB+	Aaa to Baa1	0.04%
0.15% to <0.25%	BBB+ to BBB	BBB+ to BBB	Baa1 to Baa2	0.19%
0.25% to <0.50%	BBB to BB+	BBB to BB+	Baa2 to Ba1	0.36%
0.50% to <0.75%	BB+	BB+	Ba1	0.61%
0.75% to <2.50%	BB+ to B+	BB+ to B+	Ba1 to B1	1.62%
2.50% to <10.00%	B+ to B-	B+ to B-	B1 to B3	5.19%
10.00% to <100.00%	B- to CCC	B- to CCC	B3 to Caa2	14.02%

1 The number of obligors used in the calculation is based on the transactional-based approach.

2 Reflects risk data where prudential portfolios are not captured and which only covers the time period until end of previous year. Accordingly for these columns approximations are required. Further, fast defaults are in tendency understated since capturing of fast defaults is not available for all clients in risk data. Underlying default rates are determined on client level, i.e. a client can have more than one transaction/credit.

	Arithmetic average PD by obligors [1]	Number of obligors: End of previous year	End of the year	Defaulted obligors in the year [2]	of which: new defaulted obligors in the year [2]	Average historical annual default rate [2]
	0.07%	2,724	2,885	0	0	0.02%
	0.21%	1,706	1,267	1	0	0.08%
	0.37%	1,297	1,759	1	0	0.11%
	0.63%	1,353	1,352	2	0	0.25%
	1.31%	2,705	2,958	16	1	0.56%
	4.13%	1,923	2,428	31	1	1.71%
	20.01%	100	85	6	0	11.89%
	0.08%	42,771	46,406	7	0	0.02%
	0.18%	69,443	40,134	16	3	0.02%
	0.31%	20,747	48,313	10	0	0.06%
	0.60%	7,969	6,757	8	1	0.14%
	1.29%	7,472	6,803	14	1	0.28%
	4.45%	800	844	19	2	3.50%
	17.33%	80	69	11	0	19.09%
	1.30%	788,602	808,274	5,438	0	1.07%
	25.00%	96,906	93,274	20,346	0	22.77%
	0.04%	49,560	49,894	0	0	0.06%
	0.19%	5,040	3,589	0	0	0.40%
	0.36%	4,339	5,612	55	0	0.98%
	0.59%	11,947	11,640	0	0	0.00%
	1.64%	78,724	80,595	522	0	0.49%
	5.43%	85,657	85,017	2,771	217	3.87%
	17.76%	283	260	–	–	–

Specialized lending and equities under the simple risk-weight method

Specialized lending

The following tables show the carrying values, exposure amounts and RWA for the Group's specialized lending.

CR10 – Specialized lending

end of 4Q18	Remaining maturity	On-balance sheet amount	Off-balance sheet amount	Risk weight	Exposure amount [1]	RWA	Expected losses
Other than high-volatility commercial real estate (CHF million, except where indicated)							
Regulatory categories							
Strong	Less than 2.5 years	156	123	50%	223	118	0
	Equal to or more than 2.5 years	318	892	70%	808	600	3
Good	Less than 2.5 years	835	31	70%	852	632	3
	Equal to or more than 2.5 years	294	219	90%	414	395	3
Satisfactory		88	156	115% [2]	174	212	5
Weak		60	0	250%	60	160	5
Default		36	0	–	36	–	18
Total		**1,787**	**1,421**	**–**	**2,567**	**2,117**	**37**
High-volatility commercial real estate (CHF million, except where indicated)							
Regulatory categories							
Good	Equal to or more than 2.5 years	157	110	120%	217	276	1
Satisfactory		7	1	140%	7	10	0
Default		35	0	–	35	0	0
Total		**199**	**111**	**–**	**259**	**286**	**1**
end of 2Q18							
Other than high-volatility commercial real estate (CHF million, except where indicated)							
Regulatory categories							
Strong	Less than 2.5 years	195	332	50%	344	182	0
	Equal to or more than 2.5 years	167	593	70%	249	185	1
Good	Less than 2.5 years	92	91	70%	518	384	2
	Equal to or more than 2.5 years	172	178	90%	292	278	2
Satisfactory		116	157	115% [2]	187	228	5
Weak		49	28	250%	65	171	5
Default		183	0	–	0	–	35
Total		**974**	**1,379**	**–**	**1,655**	**1,428**	**50**
High-volatility commercial real estate (CHF million, except where indicated)							
Regulatory categories							
Good	Equal to or more than 2.5 years	130	17	120%	107	135	0
Default		13	0	–	13	0	7
Total		**143**	**17**	**–**	**120**	**135**	**7**

1 Includes project finance, object finance, commodities finance and IPRE.
2 For a portion of the exposure, a risk weight of 120% is applied.

Equity positions in the banking book

For equity type securities in the banking book, risk weights are determined using the simple risk-weight approach, which differentiates by equity sub-asset types, such as exchange-traded and other equity exposures.

RWA relating to equities under the simple risk-weight approach were stable compared to the end of 2Q18.

CR10 – Equity positions in the banking book under the simple risk-weight approach

end of	On-balance sheet amount	Off-balance sheet amount	Risk weight	Exposure amount	RWA
4Q18 (CHF million, except where indicated)					
Exchange-traded equity exposures	21	0	300%	21	67
Other equity exposures	1,960	0	400%	1,960	8,311
Total	**1,981**	**0**	–	**1,981**	**8,378**
2Q18 (CHF million, except where indicated)					
Exchange-traded equity exposures	33	0	300%	33	105
Other equity exposures	1,929	0	400%	1,929	8,181
Total	**1,962**	**0**	–	**1,962**	**8,286**

Counterparty credit risk

General

Counterparty exposure

Counterparty credit risk (CCR) arises from OTC and exchange-traded derivatives, and SFTs such as repurchase agreements, securities lending and borrowing and other similar products. CCR exposures depend on the value of underlying market factors (e.g., interest rates and foreign exchange rates), which can be volatile and are therefore uncertain in nature and change over time.

Credit Suisse has received approval from FINMA to use the IMM for measuring CCR for the majority of the derivative and secured financing exposures using Potential Exposure metric.

→ Refer to "Credit risk" (pages 158 to 161) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk coverage and management in the Credit Suisse Annual Report 2018 for further information on counterparty credit risk, including transaction rating, credit approval process and provisioning.

→ Refer to "Credit risk reporting" (page 12) in Credit risk – General for information on our counterparty risk reporting.

Credit limits

All credit exposure is approved, either through approval of an individual transaction/facility (e.g., lending facilities), or under a system of credit limits (e.g., OTC derivatives). Credit exposure is monitored daily to ensure it does not exceed the approved credit limit. Credit limits are set either on a potential exposure basis or on a notional exposure basis. Moreover, these limits are ultimately governed by the Group Risk Appetite Framework. Potential exposure means the possible future value that would be lost upon default of the counterparty on a particular future date, and is taken as a high percentile of a distribution of possible exposures computed by the internal exposure models. Secondary debt inventory positions are subject to separate limits that are set at the issuer level.

→ Refer to "Credit risk" (pages 158 to 161) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk coverage and management in the Credit Suisse Annual Report 2018 for further information on credit limits.

Central counterparties risk

The Basel III framework provides specific requirements for exposures the Group has to CCPs arising from OTC derivatives, exchange-traded derivative transactions and SFTs. Exposures to CCPs which are considered to be qualifying CCPs by the regulator will receive a preferential capital treatment compared to exposures to non-qualifying CCPs.

The Group can incur exposure to CCPs as either a clearing member, or clearing through another member. Qualifying CCPs are expected to be subject to best-practice risk management, and sound regulation and oversight to ensure that they reduce risk, both for their participants and for the financial system. Most CCPs are benchmarked against standards issued by the Committee on Payment and Settlement Systems and the Technical Committee of the International Organization of Securities Commissions, herein collectively referred to as "CPSS-IOSCO".

The exposures to CCP (represented as "Central counterparties (CCP) risks") consist of trade exposure, default fund exposure and contingent exposure based on trade replacement due to a clearing member default. Trade exposure represents the current and potential future exposure of the clearing member (or a client) to a CCP arising from the underlying transaction and the initial margin posted to the CCP. Default fund exposure represents existing and potential future additional contributions to a CCPs default fund. Credit Risk Management performs credit assessment and annual review of the risk profile of CCPs as counterparties including an assessment of qualitative and quantitative factors. As part of its assessment, Credit Risk Management conducts periodic due diligence and in conjunction with General Counsel will make a determination whether (i) the CCP is a qualifying CCP and (ii) the collateral posted is considered bankruptcy remote The determinations are subject to CRM guidelines and include a review of collateral bankruptcy remoteness and verification that CCP collateral positions are held in custody with entities that employ account segregation and safekeeping procedures with internal controls that fully protect these securities. The determination is made in the context of "Authorization of CCP" (European Market Infrastructure Regulation (EMIR), Article 14) and "Third Countries" (EMIR, Article 25). This information will be appropriately reflected in the risk weightings within the capital calculations.

The Group monitors its daily exposure to the CCP as part of its ongoing limit and exposure monitoring process.

→ Refer to "Credit risk" (page 12) for further information.

Credit valuation adjustment risk

CVA is a regulatory capital charge designed to capture the risk associated with potential mark-to-market losses associated with the deterioration in the creditworthiness of a counterparty.

Under Basel III, banks are required to calculate capital charges for CVA under either the Standardized CVA approach or the Advanced CVA approach (ACVA). The CVA rules stipulate that where banks have permission to use market risk VaR and counterparty risk IMM, they are to use the ACVA unless their regulator decides otherwise. FINMA has confirmed that the ACVA should be used for both IMM and non-IMM exposures.

The regulatory CVA capital charge applies to all counterparty exposures arising from OTC derivatives, excluding those with CCP. Exposures arising from SFT are not required to be included in the CVA charge unless they could give rise to a material loss. FINMA has confirmed that Credit Suisse can exclude these exposures from the regulatory capital charge.

Guarantees and other risk mitigants

→ Refer to "Credit risk mitigation" (pages 16 to 17) in Credit risk for further information on policies relating to guarantees and other risk mitigants.

Wrong-way exposure

Wrong-way risk arises when Credit Suisse enters into a financial transaction in which exposure is adversely correlated to the creditworthiness of the counterparty. In a wrong-way situation, the exposure to the counterparty increases while the counterparty's financial condition and its ability to pay on the transaction diminishes.

Exposure adjusted risk calculation

Regulatory guidance distinguishes two types of wrong-way risk, general and specific:

- General wrong-way risk arises when the probability of default of counterparties is positively correlated with general market risk factors.
- Specific wrong-way risk arises when the exposure to a particular counterparty is positively correlated with the probability of default of the counterparty due to the nature of the transactions with the counterparty.

Capturing wrong-way risk requires checking if there is a legal relationship or a correlation between the trade/collateral and the counterparty.

The management of wrong-way risk is integrated within Credit Suisse's overall credit risk assessment approach and is subject to a framework for identification and treatment of wrong-way risk, which includes multiple processes, methodologies, governance, reporting, review and escalation. A conservative treatment for the purpose of calculating exposure profiles is applied to material trades with wrong-way risk features. The wrong-way risk framework applies to OTC, SFTs, loans and centrally cleared trades.

In instances where a material wrong-way risk has been identified, limit utilization and default capital are accordingly adjusted through more conservative exposure calculations. These adjustments cover both transactions and collateral and form part of the daily credit exposure calculation process, resulting in a higher utilization of the counterparty credit limit.

Regular reporting of wrong-way risk at both the individual trade and portfolio level allows wrong-way risk to be identified and corrective actions taken by Credit Risk Management. The Front Office is responsible as a first line of defense for identifying and escalating trades that could potentially give rise to wrong-way risk. Any material wrong-way risk at portfolio or trade level would be escalated to senior Credit Risk Management executives and risk committees.

Effect of a credit rating downgrade

On a daily basis, we monitor the level of incremental collateral that would be required by derivative counterparties in the event of a Credit Suisse ratings downgrade. Collateral triggers are maintained by our collateral management department and vary by counterparty.

→ Refer to "Credit ratings" (pages 120 to 121) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Liquidity and funding management – Funding management in the Credit Suisse Annual Report 2018 for further information on the effect of a one, two or three notch downgrade as of December 31, 2018.

The impact of downgrades in the Bank's long-term debt ratings are considered in the stress assumptions used to determine the conservative funding profile of our balance sheet and would not be material to our liquidity and funding needs.

Details of counterparty credit risk exposures

Analysis of counterparty credit risk exposure by approach

The following table provides a comprehensive view of the methods used to calculate CCR regulatory requirements and the main parameters used within each method.

CCR1 – Analysis of counterparty credit risk exposure by approach

end of	Re-placement cost	PFE	EEPE	Alpha used for computing regulatory EAD	EAD post-CRM	RWA
4Q18 (CHF million, except where indicated)						
SA-CCR (for derivatives) [1]	4,223	2,722	–	1.0	6,740	2,463
IMM (for derivatives and SFTs)	–	–	18,629	1.6 [2]	29,807	9,138
Simple Approach for CRM (for SFTs)	–	–	–	–	42	0
Comprehensive Approach for CRM (for SFTs)	–	–	–	–	13	6
VaR for SFTs	–	–	–	–	28,466	4,594
Total	**–**	**–**	**–**	**–**	**65,068**	**16,201**
2Q18 (CHF million, except where indicated)						
SA-CCR (for derivatives) [1]	4,638	3,359	–	1.0	7,712	2,520
IMM (for derivatives and SFTs)	–	–	23,926 [3]	1.4 [4]	33,470 [3]	10,237
Simple Approach for CRM (for SFTs)	–	–	–	–	56	0
Comprehensive Approach for CRM (for SFTs)	–	–	–	–	6	3
VaR for SFTs	–	–	–	–	33,944 [3]	4,714
Total	**–**	**–**	**–**	**–**	**75,188** [3]	**17,474**

1 Calculated under the current exposure method.
2 For a smaller portion of the derivative exposure and SFTs, an alpha of 1.4 is applied.
3 Prior period has been corrected.
4 For a smaller portion of the derivative exposure, an alpha of 1.6 is applied.

CVA capital charge

The following table shows the CVA regulatory calculations with a breakdown by standardized and advanced approaches.

CCR2 – CVA capital charge

	4Q18		2Q18	
end of	EAD post-CRM	RWA	EAD post-CRM	RWA
CHF million				
Total portfolios subject to the advanced CVA capital charge	31,650	5,669	32,332	5,174
of which VaR component (including the 3 x multiplier)	–	1,952	–	1,592
of which stressed VaR component (including the 3 x multiplier)	–	3,717	–	3,582
All portfolios subject to the standardized CVA capital charge	73	74	68	65
Total subject to the CVA capital charge	**31,723**	**5,743**	**32,400**	**5,239**

RWA increased CHF 0.5 billion compared to the end of 2Q18, mainly due to a decrease in hedging benefits, partially offset by a reduction in risk levels resulting from a decrease in exposures.

CCR exposures by regulatory portfolio and risk weights – standardized approach

The following table shows a breakdown of CCR exposures calculated according to the standardized approach by portfolio (type of counterparties) and by risk weight (riskiness attributed according to standardized approach).

CCR3 – CCR exposures by regulatory portfolio and risk weights – standardized approach

	Risk weight								
end of	0%	10%	20%	50%	75%	100%	150%	Others	Exposures post-CCF and CRM
4Q18 (CHF million)									
Retail	0	0	0	0	0	18	0	0	18
Other exposures	42	0	0	0	0	349	0	0	391
Total	**42**	**0**	**0**	**0**	**0**	**367**	**0**	**0**	**409**
2Q18 (CHF million)									
Retail	0	0	0	0	0	31	0	0	31
Other exposures	56	0	0	0	0	327	0	0	383
Total	**56**	**0**	**0**	**0**	**0**	**358**	**0**	**0**	**414**

CCR exposures by portfolio and PD scale – IRB models
The following table provides all relevant parameters used for the calculation of CCR capital requirements for IRB models.

→ Refer to "Rating models" (pages 24 to 25) in Credit risk – Credit risk under internal risk-based approaches for further information on key models used at the group-wide level, explanation how the scope of models was determined and the risk-weighted assets covered by the models shown for each of the regulatory portfolios.

CCR4 – CCR exposures by portfolio and PD scale – IRB models

end of 4Q18	EAD post-CRM	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA	RWA density
Sovereigns (CHF million, except where indicated)							
0.00% to <0.15%	2,635	0.03%	59	48%	0.5	145	6%
0.15% to <0.25%	471	0.22%	4	41%	1.0	142	30%
0.50% to <0.75%	0	0.64%	2	42%	1.0	0	56%
0.75% to <2.50%	37	1.89%	3	53%	0.3	39	106%
2.50% to <10.00%	210	9.31%	6	52%	0.4	413	197%
Sub-total	**3,353**	**0.65%**	**74**	**47%**	**0.5**	**739**	**22%**
Institutions – Banks and securities dealer							
0.00% to <0.15%	14,122	0.06%	532	58%	0.6	2,708	19%
0.15% to <0.25%	341	0.22%	88	57%	0.9	173	51%
0.25% to <0.50%	383	0.37%	85	53%	1.0	249	65%
0.50% to <0.75%	53	0.64%	55	53%	0.8	39	74%
0.75% to <2.50%	386	1.79%	103	51%	0.4	450	117%
2.50% to <10.00%	139	6.00%	102	49%	0.9	209	151%
10.00% to <100.00%	8	23.55%	10	50%	1.0	23	270%
100.00% (Default)	17	100.00%	2	60%	1.0	18	106%
Sub-total	**15,449**	**0.29%**	**977**	**58%**	0.7	**3,869**	**25%**
Institutions – Other institutions							
0.00% to <0.15%	93	0.05%	32	46%	3.3	23	25%
0.15% to <0.25%	5	0.19%	2	30%	4.2	2	40%
0.25% to <0.50%	1	0.36%	2	43%	2.6	0	62%
0.50% to <0.75%	0	0.58%	2	53%	1.2	0	92%
Sub-total	**99**	**0.06%**	**38**	**45%**	**3.4**	**25**	**26%**
Corporates – Specialized lending							
0.00% to <0.15%	110	0.04%	20	41%	4.1	27	24%
0.15% to <0.25%	10	0.20%	17	30%	3.3	3	32%
0.25% to <0.50%	12	0.37%	16	44%	4.6	8	69%
0.50% to <0.75%	4	0.62%	8	38%	4.6	3	75%
0.75% to <2.50%	12	1.05%	20	29%	4.0	9	70%
2.50% to <10.00%	0	5.29%	3	10%	4.6	0	38%
10.00% to <100.00%	0	14.58%	1	28%	2.5	0	129%
Sub-total	**148**	**0.20%**	**85**	**39%**	**4.1**	**50**	**34%**

CCR4 – CCR exposures by portfolio and PD scale – IRB models (continued)

end of 4Q18	EAD post-CRM	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA	RWA density
Corporates without specialized lending (CHF million, except where indicated)							
0.00% to <0.15%	36,995	0.05%	10,508	50%	0.6	4,128	11%
0.15% to <0.25%	1,606	0.22%	1,162	46%	1.5	662	41%
0.25% to <0.50%	936	0.37%	594	56%	1.4	650	69%
0.50% to <0.75%	681	0.64%	470	56%	1.1	600	88%
0.75% to <2.50%	1,272	1.44%	1,247	70%	1.1	2,071	163%
2.50% to <10.00%	1,081	4.67%	1,837	53%	0.9	2,457	227%
10.00% to <100.00%	18	27.70%	8	41%	1.3	51	279%
100.00% (Default)	30	100.00%	7	53%	1.0	32	106%
Sub-total	**42,619**	**0.31%**	**15,833**	**51%**	**0.7**	**10,651**	**25%**
Other retail							
0.00% to <0.15%	2,453	0.07%	1,730	58%	1.0	325	13%
0.15% to <0.25%	182	0.19%	303	33%	1.7	24	13%
0.25% to <0.50%	54	0.35%	262	29%	1.6	10	18%
0.50% to <0.75%	167	0.58%	696	50%	1.2	68	41%
0.75% to <2.50%	100	1.41%	130	38%	1.0	42	42%
2.50% to <10.00%	2	4.16%	39	43%	1.3	1	66%
10.00% to <100.00%	2	20.28%	2	19%	5.0	1	46%
100.00% (Default)	7	100.00%	3	100%	1.0	8	106%
Sub-total	**2,967**	**0.41%**	**3,165**	**55%**	**1.0**	**479**	**16%**
Sub-total (all portfolios)							
0.00% to <0.15%	56,408	0.05%	12,881	52%	0.6	7,356	13%
0.15% to <0.25%	2,615	0.22%	1,576	45%	1.4	1,006	38%
0.25% to <0.50%	1,386	0.37%	959	54%	1.3	917	66%
0.50% to <0.75%	905	0.63%	1,233	55%	1.1	710	79%
0.75% to <2.50%	1,807	1.52%	1,503	63%	0.9	2,611	144%
2.50% to <10.00%	1,432	5.48%	1,987	53%	0.8	3,080	215%
10.00% to <100.00%	28	25.99%	21	42%	1.4	75	262%
100.00% (Default)	54	100.00%	12	61%	1.0	58	106%
Sub-total (all portfolios)	**64,635**	**0.33%**	**20,172**	**52%**	**0.7**	**15,813**	**24%**
Alternative treatment							
Exposures from free deliveries applying standardized risk weights or 100% under the alternative treatment	–	–	–	–	–	0	–
Total (all portfolios and alternative treatment)							
Total (all portfolios and alternative treatment)	**64,635**	**0.33%**	**20,172**	**52%**	**0.7**	**15,813**	**24%**

EAD post-CRM decreased CHF 10.1 billion compared to the end of 2Q18, reflecting lower OTC derivatives exposures primarily in corporates without specialized lending, banks and securities dealers and sovereigns.

CCR4 – CCR exposures by portfolio and PD scale – IRB models

end of 2Q18	EAD post-CRM	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA	RWA density
Sovereigns (CHF million, except where indicated)							
0.00% to <0.15%	3,715	0.02%	61	54%	0.4	187	5%
0.15% to <0.25%	722	0.22%	4	41%	1.0	214	30%
0.50% to <0.75%	0	0.64%	1	42%	1.0	0	53%
0.75% to <2.50%	54	1.10%	2	53%	0.2	45	83%
2.50% to <10.00%	106	8.87%	3	52%	0.3	207	195%
10.00% to <100.00%	0	16.44%	1	44%	1.0	0	219%
Sub-total	**4,597**	**0.27%**	**72**	**52%**	**0.5**	**653**	**14%**
Institutions – Banks and securities dealer							
0.00% to <0.15%	16,519	0.06%	560	56%	0.6	3,126	19%
0.15% to <0.25%	915	0.22%	100	56%	0.7	436	48%
0.25% to <0.50%	440	0.37%	89	52%	0.9	262	60%
0.50% to <0.75%	187	0.64%	61	53%	0.5	132	70%
0.75% to <2.50%	404	1.35%	126	51%	0.8	420	104%
2.50% to <10.00%	142	6.78%	114	48%	0.7	204	143%
10.00% to <100.00%	4	23.35%	6	34%	1.0	9	204%
100.00% (Default)	25	100.00%	1	60%	1.0	27	106%
Sub-total	**18,636**	**0.30%**	**1,057**	**56%**	0.6	**4,616**	**25%**
Institutions – Other institutions							
0.00% to <0.15%	149	0.04%	38	44%	2.9	31	21%
0.15% to <0.25%	11	0.20%	5	37%	3.4	5	42%
0.25% to <0.50%	1	0.37%	1	44%	3.3	0	71%
0.50% to <0.75%	0	0.58%	3	53%	3.4	0	105%
Sub-total	**161**	**0.05%**	**47**	**44%**	**3.0**	**36**	**22%**
Corporates – Specialized lending							
0.00% to <0.15%	109	0.04%	19	40%	4.7	29	27%
0.15% to <0.25%	15	0.21%	25	33%	4.2	6	41%
0.25% to <0.50%	7	0.37%	14	34%	4.6	4	55%
0.50% to <0.75%	7	0.58%	9	33%	5.0	5	70%
0.75% to <2.50%	10	0.96%	17	21%	4.4	5	48%
2.50% to <10.00%	1	4.48%	6	14%	3.8	0	49%
Sub-total	**149**	**0.19%**	**90**	**37%**	**4.6**	**49**	**33%**

CCR4 – CCR exposures by portfolio and PD scale – IRB models (continued)

end of 2Q18	EAD post-CRM	Average PD	Number of obligors	Average LGD	Average maturity (years)	RWA	RWA density
Corporates without specialized lending (CHF million, except where indicated)							
0.00% to <0.15%	42,227	0.05%	11,620	51%	0.6	4,501	11%
0.15% to <0.25%	1,712	0.21%	1,207	45%	1.7	727	42%
0.25% to <0.50%	781	0.37%	557	56%	1.8	582	74%
0.50% to <0.75%	652	0.63%	519	62%	1.2	671	103%
0.75% to <2.50%	1,082	1.50%	1,411	69%	1.1	1,909	176%
2.50% to <10.00%	1,230	4.29%	2,079	57%	0.9	2,840	231%
10.00% to <100.00%	24	27.99%	16	52%	1.0	106	448%
100.00% (Default)	4	100.00%	6	53%	2.2	4	106%
Sub-total	**47,712**	**0.23%**	**17,415**	**52%**	**0.7**	**11,340**	**24%**
Other retail							
0.00% to <0.15%	3,143	0.07%	1,877	49%	0.9	323	10%
0.15% to <0.25%	241	0.18%	383	21%	1.5	21	9%
0.25% to <0.50%	45	0.37%	254	23%	1.7	7	14%
0.50% to <0.75%	14	0.58%	922	27%	2.2	3	22%
0.75% to <2.50%	58	0.96%	146	50%	1.4	30	52%
2.50% to <10.00%	19	4.06%	35	33%	1.1	10	51%
10.00% to <100.00%	2	19.26%	6	16%	5.0	1	38%
100.00% (Default)	0	100.00%	1	53%	1.0	0	107%
Sub-total	**3,522**	**0.12%**	**3,624**	**47%**	**0.9**	**395**	**11%**
Sub-total (all portfolios)							
0.00% to <0.15%	65,862	0.05%	14,175	52%	0.6	8,197	12%
0.15% to <0.25%	3,616	0.21%	1,724	45%	1.3	1,409	39%
0.25% to <0.50%	1,274	0.37%	915	53%	1.5	855	67%
0.50% to <0.75%	860	0.63%	1,515	59%	1.1	811	94%
0.75% to <2.50%	1,608	1.42%	1,702	63%	1.0	2,409	150%
2.50% to <10.00%	1,498	4.85%	2,237	56%	0.9	3,261	218%
10.00% to <100.00%	30	26.84%	29	47%	1.2	116	391%
100.00% (Default)	29	100.00%	8	59%	1.2	31	106%
Sub-total (all portfolios)	**74,777**	**0.25%**	**22,305**	**52%**	**0.7**	**17,089**	**23%**
Alternative treatment							
Exposures from free deliveries applying standardized risk weights or 100% under the alternative treatment	–	–	–	–	–	0	–
Total (all portfolios and alternative treatment)							
Total (all portfolios and alternative treatment)	**74,777**	**0.25%**	**22,305**	**52%**	**0.7**	**17,089**	**23%**

Composition of collateral for CCR exposure

The following table shows a breakdown of all types of collateral posted or received by banks to support or reduce the CCR exposures related to derivative transactions or to SFTs, including transactions cleared through a CCP. For disclosure purposes, the SFT collateral values are presented as the market value of the collateral without regulatory or contractual haircuts.

By their nature, various components of the SFT business do not attract haircuts on a trade-by-trade basis, and as such a contractual haircut cannot be uniformly derived for the entire collateral population.

CCR5 – Composition of collateral for CCR exposure

	Collateral used in derivative transactions						Collateral used in SFTs	
	Fair value of collateral received			Fair value of posted collateral			Fair value of collateral received	Fair value of posted collateral
end of	Segregated	Unsegregated	Total	Segregated	Unsegregated	Total		
4Q18 (CHF million) [1]								
Cash – domestic currency	16,897	1,718	18,615	0	4,198	4,198	1,011	5,039
Cash – other currencies	1,467	23,181	24,648	0	36,155	36,155	261,814	338,456
Domestic sovereign debt	3,808	34	3,842	0	1	1	3,939	1,356
Other sovereign debt	6,740	5,473	12,213	4,778	2,469	7,247	301,880	215,627
Government agency debt	673	54	727	0	0	0	2,530	5,940
Corporate bonds	1,028	1,655	2,683	44	337	381	74,453	30,317
Equity securities	2,202	344	2,546	0	2,443	2,443	270,160 [2]	71,441 [2]
Other collateral	7,380	93	7,473	0	0	0	29,015	36,799
Total	**40,195**	**32,552**	**72,747**	**4,822**	**45,603**	**50,425**	**944,802**	**704,975**
2Q18 (CHF million)								
Cash – domestic currency	1	2,261	2,262	0	3,915	3,915	1,001	7,261
Cash – other currencies	1,379	26,292	27,671	951	32,555	33,506	229,588	320,313
Domestic sovereign debt	0	17	17	0	10	10	3,975	1,503
Other sovereign debt	5,265	5,998	11,263	5,841	3,842	9,683	277,548	185,643
Government agency debt	38	17	55	0	0	0	1,542	7,624
Corporate bonds	935	1,777	2,712	93	1,107	1,200	96,411	25,974
Equity securities	1,960	387	2,347	0	787	787	285,547 [2]	79,508 [2]
Other collateral	7,367	239	7,606	0	0	0	25,434	27,454
Total	**16,945**	**36,988**	**53,933**	**6,885**	**42,216**	**49,101**	**921,046**	**655,280**

1 4Q18 numbers include collateral for cleared derivatives and SFTs.

2 The Equity Prime Brokerage business consists of clients acquiring long and short positions in the market in a Credit Suisse account along with the appropriate margins. In the case of a counterparty default, Credit Suisse gains control over the long positions and are free to sell them to cover the exposure and the long positions are thus considered as 'collateral received'. On the other hand, the short positions are considered as 'trades' and are not reported in the disclosure as 'posted collateral'.

The fair value of collateral received on SFTs increased CHF 23.8 billion compared to the end of 2Q18 mainly relating to cash – other currencies and other sovereign debt, partially offset by decreases in corporate bonds and equity securities. The fair value of collateral posted for SFTs increased CHF 49.7 billion compared to the end of 2Q18 mainly related to other sovereign debt and cash – other currencies. These changes were primarily due to changes in product portfolios.

Credit derivatives exposures

We enter into derivative contracts in the normal course of business for market making, positioning and arbitrage purposes, as well as for our own risk management needs, including mitigation of interest rate, foreign currency and credit risk. Derivative exposure also includes economic hedges, where the Group enters into derivative contracts for its own risk management purposes but where the contracts do not qualify for hedge accounting under US GAAP. Derivative exposures are calculated according to regulatory methods, using either the current exposures method or approved IMM. These regulatory methods take into account potential future movements and as a result generate risk exposures that are greater than the net replacement values disclosed for US GAAP.

As of the end of 4Q18, no credit derivatives were utilized that qualify for hedge accounting under US GAAP.

→ Refer to "Derivative instruments" (pages 178 to 180) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk review and results in the Credit Suisse Annual Report 2018 for further information on derivative instruments, including counterparties and their creditworthiness.

→ Refer to "Note 32 – Derivatives and hedging activities" (pages 339 to 344) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on the fair value of derivative instruments and the distribution of current credit exposures by types of credit exposures.

→ Refer to "Note 27 – Offsetting of financial assets and financial liabilities" (pages 313 to 316) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on netting benefits, netted current credit exposures, collateral held and net derivatives credit exposure.

The following table shows the extent of the Group's exposures to credit derivative transactions broken down between derivatives bought or sold.

CCR6 – Credit derivatives exposures

	4Q18		2Q18	
end of	Protection bought	Protection sold	Protection bought	Protection sold
Notionals (CHF billion)				
Single-name CDS	96.4	72.3	99.4	75.5
Index CDS	112.4	106.0	104.9	96.3
Total return swaps	4.5	5.2	5.1	5.1
Credit options	0.6	0.0	0.9	0.0
Other credit derivatives	48.7	23.3	56.8	18.6
of which credit default swaptions	48.7	23.3	56.8	18.6
Total notionals	**262.6**	**206.8**	**267.1**	**195.5**
Fair values (CHF billion)				
Positive fair value (asset)	3.3	2.1	2.7	4.0
Negative fair value (liability)	3.8	2.8	5.7	2.4

Protection bought decreased CHF 4.5 billion compared to the end of 2Q18 primarily relating to credit default swaptions and single-name CDS, partially offset by increases in index CDS. Protection sold increased CHF 12.1 billion compared to the end of 2Q18 primarily relating to index CDS and credit default swaptions, partially offset by decreases in single-name CDS.

→ Refer to "Note 32 – Derivatives and hedging activities" (pages 343 to 344) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on credit protection bought and credit protection sold.

RWA flow statements of CCR exposures under IMM

The following table presents the 4Q18 flow statement explaining changes in CCR RWA determined under the IMM for CCR (derivatives and SFTs).

CCR7 – Risk-weighted assets flow statements of CCR exposures under IMM

4Q18	RWA
CHF million	
Risk-weighted assets at beginning of period	**14,713** [1]
Asset size	(856)
Credit quality of counterparties	125
Model and parameter updates	128
Methodology and policy changes	33
Foreign exchange impact	(57)
Risk-weighted assets at end of period	**14,086**

1 Prior period number has been corrected.

CCR RWA under IMM of CHF 14.1 billion decreased 4% compared to the end of 3Q18, primarily driven by decreases relating to asset size due to reductions in exposures.

→ Refer to "RWA flow statements of credit risk exposures under IRB" (page 36) in Credit risk for the definitions of the RWA flow statements components.

Exposures to central counterparties

The following table provides a comprehensive picture of the Group's exposure to CCPs.

CCR8 – Exposures to central counterparties

	4Q18		2Q18	
	EAD (post-CRM)	RWA	EAD (post-CRM)	RWA
CHF million				
Exposures to QCCPs (total)	**–**	**1,294**	**–**	**1,737**
Exposures for trades at QCCPs	16,200	323	18,327	591
of which OTC derivatives	5,516	110	7,184	144
of which exchange-traded derivatives	9,768	195	10,355	431
of which SFTs	916	18	788	16
Segregated initial margin	303	–	60	–
Non-segregated initial margin	1,163	25	0	0
Pre-funded default fund contributions	2,937	946	4,274 [1]	1,146
Exposures to non-QCCPs (total)	**–**	**118**	**–**	**62**
Exposures for trades at non-QCCPs	97	97	41	44
of which exchange-traded derivatives	0	0	0	3
of which SFTs	97	97	41	41
Pre-funded default fund contributions	6	21	6 [1]	18

Exposures associated with initial margin have been subsumed within disclosures under "Exposures for trades" where they are not separately identifiable due to EAD using IMM.

1 Prior period numbers have been restated to include EAD (post-CRM) values for pre-funded default fund contributions.

Securitization

General

The following disclosures, which also considers the "Industry good practice guidelines on Pillar 3 disclosure requirements for securitization", refer to traditional and synthetic securitizations held in the banking and trading book and regulatory capital on these exposures calculated according to the Basel framework for securitizations.

→ Refer to "Note 34 – Transfers of financial assets and variable interest entities" (pages 349 to 358) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on securitization, the various roles, the use of SPEs, the involvement of the Group in consolidated and non-consolidated SPEs, the accounting policies for securitization activities and methods and key assumptions applied in valuing positions retained/purchased and gains/losses relating to RMBS and CMBS securitization activity in 2018.

A traditional securitization is a structure where an underlying pool of assets is sold to an SPE which pays for the assets by issuing tranched securities collateralized by the underlying asset pool. A synthetic securitization is a tranched structure where the credit risk of an underlying pool of assets is transferred, in whole or in part, through the use of credit derivatives or guarantees that may serve to hedge the credit risk of the portfolio. Many synthetic securitizations are not accounted for as securitizations under US GAAP. In both traditional and synthetic securitizations, risk is dependent on the seniority of the retained interest and the performance of the underlying asset pool.

Roles and activities in connection with securitization

Securitization in the banking book

The Group is active in various roles in connection with securitization, including originator, investor and sponsor. As originator, the Group creates or purchases financial assets (e.g., commercial mortgages or corporate loans) and then securitizes them in a traditional or synthetic transaction that achieves significant risk transfer to third party investors. The Group acts as liquidity provider to Alpine Securitization Ltd. (Alpine), a multi-seller commercial paper conduit administered by Credit Suisse and also provides liquidity to a couple of Asset Backed Commercial Paper programs managed by third party administrators.

In addition, the Group invests in securitization-related products created by third parties.

The Group has both securitization and re-securitization transactions in the banking book referencing different types of underlying assets including real estate loans (commercial and residential).

Securitization in the trading book

Within its mortgage business there are four key roles that the Group undertakes within securitization markets: issuer, underwriter, market maker and financing counterparty. The Group holds one of the top trading franchises in market making in all major securitized product types and is a top issuer and underwriter in the re-securitization market in the US as well as being one of the top underwriters in asset-backed securities (ABS) securitization in the US. In addition the Group also has a relatively small correlation trading portfolio.

The Group's key objective in relation to trading book securitization is to meet clients' investment and divestment needs by making markets in securitized products across all major collateral types, including residential mortgages, commercial mortgages, asset finance (i.e. auto loans, credit card receivables, etc.) and corporate loans. The Group focuses on opportunities to intermediate transfers of risk between sellers and buyers.

The Group is also active in new issue securitization and re-securitization. The Group's Securitized Products Finance team provides short-term secured warehouse financing to clients who originate credit card, auto loan, and other receivables, and the Group sells asset-backed securities collateralized by these receivables to provide its clients long-term financing that matches the lives of their assets.

At times, the Group purchases loans and bonds for the purpose of securitization and sells these assets to SPEs which in turn issue new securities. Re-securitizations of previously issued mortgage-backed securities (typically RMBS) securities occur when certificates issued out of an existing securitization vehicle are sold into a newly created and separate securitization vehicle.

Risks assumed and retained

Key risks retained while securities or loans remain in inventory are related to the performance of the underlying assets (residential real estate loans, commercial loans, credit card loans, etc.). These risks are summarized in the securitization pool level attributes: PD of underlying loans (default rate), the severity of loss and prepayment speeds. The transactions may also be exposed to general market risk, credit spread and counterparty credit risk.

The Group maintains models for both government-guaranteed and private label mortgage products. These models project the above risk drivers based on market interest rates and volatility as well as macro-economic variables such as housing price index, projected GDP and inflation, unemployment etc.

In its role as a market maker, the Group actively trades in and out of positions. Both Front Office and Risk Management continuously monitor liquidity risk as reflected in trading spreads and trading volumes. To address liquidity concerns a specific set of limits on the size of aged positions are in place for the securitized positions we hold.

The Group classifies securities within the transactions by the nature of the collateral (residential, commercial, ABS, CLOs, etc.) and the seniority each security has in the capital structure (i.e. senior, mezzanine, subordinate etc.), which in turn will be reflected in the transaction risk assessment. Risk Management monitors portfolio composition by capital structure and collateral

type on a daily basis with subordinate exposure and each collateral type subject to separate risk limits and risk flags. In addition, the Group's internal risk methodology is designed such that risk charges are based on the place the particular security holds in the capital structure, the less senior the bond the higher the risk charges.

For re-securitization risk, the Group's risk management models take a 'look through' approach where they model the behavior of the underlying securities or constituent counterparties based on their own particular collateral and then transmit that to the re-securitized position. No additional risk factors are considered within the re-securitization portfolios in addition to those identified and measured within securitization risk.

With respect to both the wind-down corporate correlation trading portfolio and the on-going transactions the key risks that need to be managed includes default risk, counterparty credit risk, correlation risk and cross effects between spread and correlation. The impacts of liquidity risk for securitization products is embedded within the firm's historical simulation model through the incorporation of market data from stressed periods, and in the scenario framework through the calibration of price shocks to the same period.

Both correlation and first-to-default are valued using a correlation model which uses the market implied correlation and detailed market data such as constituent spread term structure and constituent recovery. The risks embedded in securitization and re-securitizations are similar and include spread risk, recovery risk, default risk and correlation risk. The risks for different seniority of tranches will be reflected in the tranche price sensitivities to each constituent in the pools. The complexity of the correlation portfolio's risk lies in the level of convexity and cross risk inherent, for example, the risks to large spread moves and the risks to spread and correlation moving together. The risk limit framework is carefully designed to address the key risks for the correlation trading portfolio.

Monitoring of changes in credit and market risk of securitization exposures

The Group has in place a comprehensive risk management process whereby the Front Office and Risk Management work together to monitor positions and position changes, portfolio structure and trading activity and calculate a set of risk measures on a daily basis using risk sensitivities and exposures.

For the mortgage business the Group also uses monthly remittance reports (available from public sources) to get up to date information on collateral performance (delinquencies, defaults, pre-payment etc.). Monthly or quarterly reports (sourced directly from the originator or sponsor of the securitization) are used to monitor performance of most banking book securitizations.

Risk Management has also put in place a set of key risk limits for the purpose of managing the Group's risk appetite framework in relation to securitizations/re-securitizations. These limits will cover exposure measures, risk sensitivities, VaR and capital measures with the majority monitored on a daily basis. In addition within the Group's risk management framework an extensive scenario analysis framework is in place whereby all underlying risk factors are stressed to determine portfolio sensitivity.

Re-securitized products in the mortgage business go through the same risk management process but looking through the structures with the focus on the risk of the underlying securities or constituent names.

Retained banking book exposures for mortgage, ABS, CMBS and collateralized debt obligation (CDO) transactions are risk managed on the same basis as similar trading book transactions.

Risk mitigation

In addition to the strict exposure limits noted above, the Group uses a number of different risk mitigation approaches to manage risk appetite for its securitization and re-securitization exposures. Where true counterparty credit risk exposure is identified for a particular transaction, there is a requirement for it to be approved through normal credit risk management processes with collateral taken as required. The Group also may use various proxies including corporate single name and index hedges and equity hedges to mitigate the price and spread risks to which it is exposed. Hedging decisions are made by the trading desk based on current market conditions and will be made in consultation with Risk Management. Every trade has a trading mandate where unusual and material trades require approval under the Group's Pre-Trade Approval governance process. International investment banks are the main counterparties to the hedges that are used across these business areas.

Affiliated entities

In the normal course of business it is possible for the Group's managed separate account portfolios and the Group's controlled investment entities, such as mutual funds, fund of funds, private equity funds and other fund linked products to invest in the securities issued by other vehicles sponsored by the Group engaged in securitization and re-securitization activities. To address potential conflicts, standards governing investments in affiliated products and funds have been adopted.

Regulatory capital treatment of securitization structures

Banking book securitization
For banking book securitizations, the regulatory capital requirements are calculated since January 2018 with the following approaches: the Securitization Internal Ratings-Based Approach

(SEC-IRBA), the Securitization External Ratings-Based Approach (SEC-ERBA), or the Securitization Standardized Approach (SEC-SA). External ratings used in regulatory capital calculations for securitization risk exposures in the banking book are obtained from Fitch, Moody's, Standard & Poor's or Dominion Bond Rating Service.

Trading book securitization

We use the standardized measurement method (SMM) which is based on the ratings-based approach (RBA) and the supervisory formula approach (SFA) for securitization purposes and other supervisory approaches for trading book securitization positions covering the approach for nth-to-default products and portfolios covered by the weighted average risk weight approach.

Securitization exposures in the banking book

Securitization exposures in the banking book where the Group acts as originator increased CHF 2.8 billion compared to the end of 2Q18, primarily relating to new CDO/CLO securitizations.

Securitization exposures in the banking book where the Group acts as sponsor increased CHF 5.6 billion while securitization exposures in the banking book where the Group acts as investor decreased CHF 3.8 billion compared to the end of 2Q18. These movements were primarily related to the transfer of Alpine facilities from the banking book where the Group acts as investor to the banking book where the Group acts as sponsor.

SEC1 – Securitization exposures in the banking book

	Bank acts as originator			Bank acts as sponsor			Bank acts as investor		
end of	Traditional	Synthetic	**Total**	Traditional	Synthetic	**Total**	Traditional	Synthetic	**Total**
4Q18 (CHF million)									
Commercial mortgages	10	0	10	0	0	0	0	0	0
Residential mortgages	44	0	44	0	0	0	309	0	309
CDO/CLO	3,314	29,586	32,900	200	50	250	2,775	296	3,071
Other ABS	2	0	2	5,617	0	5,617	5,963	0	5,963
Total	**3,370**	**29,586**	**32,956**	**5,817**	**50**	**5,867**	**9,047**	**296**	**9,343**
2Q18 (CHF million)									
Commercial mortgages	10	0	10	0	0	0	0	0	0
Residential mortgages	478	0	478	0	0	0	223	0	223
CDO/CLO	4,155	25,271	29,426	149	71	220	2,692	297	2,989
Other ABS	200	0	200	0	0	0	9,947	0	9,947
Total	**4,843**	**25,271**	**30,114**	**149**	**71**	**220**	**12,862**	**297**	**13,159**

Securitization exposures in the trading book

SEC2 – Securitization exposures in the trading book

	Bank acts as originator			Bank acts as sponsor			Bank acts as investor		
end of	Traditional	Synthetic	**Total**	Traditional	Synthetic	**Total**	Traditional	Synthetic	**Total**
4Q18 (CHF million)									
Commercial mortgages	86	0	86	0	0	0	1,439	887	2,326
Residential mortgages	42	0	42	0	0	0	2,483	40	2,523
Other ABS	1	0	1	0	0	0	630	139	769
CDO/CLO	4	0	4	0	0	0	462	482	944
Total	**133**	**0**	**133**	**0**	**0**	**0**	**5,014**	**1,548**	**6,562**
2Q18 (CHF million)									
Commercial mortgages	94	0	94	0	0	0	1,932	717	2,649
Residential mortgages	403	0	403	0	0	0	3,213	108	3,321
Other ABS	1	0	1	0	0	0	755	128	883
CDO/CLO	3	0	3	0	0	0	302	409	711
Total	**501**	**0**	**501**	**0**	**0**	**0**	**6,202**	**1,362**	**7,564**

Securitization exposures in the trading book where the Group acts as originator decreased CHF 0.4 billion compared to the end of 2Q18. The decrease was primarily related to a wind-down of residential mortgages.

Securitization exposures in the trading book where the Group acts as investor decreased CHF 1.0 billion compared to the end of 2Q18. The decrease was primarily related to a wind-down of positions and the partial sell-off of exposures with various counterparties.

Calculation of capital requirements

The following tables show the securitization exposures in the banking book and the associated regulatory capital requirements.

→ Refer to "Market risk under standardized approach" (page 60) in Market risk for capital charges related to securitization positions in the trading book.

SEC3 – Securitization exposures in the banking book and associated regulatory capital requirements – Credit Suisse acting as originator or as sponsor

	Exposure value (by RW band)				
end of	<=20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1250% RW	1250% RW
4Q18 (CHF million)					
Total exposures	**31,986**	**6,233**	**379**	**179**	**46**
Traditional securitization	5,972	2,702	367	143	2
of which securitization	5,972	2,702	367	143	2
of which retail underlying	3,141	2,189	283	49	0
of which wholesale	2,831	513	84	94	2
Synthetic securitization	26,014	3,531	12	36	44
of which securitization	26,014	3,531	12	36	44
of which retail underlying	519	22	0	0	1
of which wholesale	25,495	3,509	12	36	43
2Q18 (CHF million)					
Total exposures	**26,718**	**3,306**	**127**	**122**	**61**
Traditional securitization	4,079	724	109	76	4
of which securitization	4,079	724	109	76	4
of which retail underlying	453	197	23	1	4
of which wholesale	3,626	527	86	75	0
Synthetic securitization	22,639	2,582	18	46	57
of which securitization	22,639	2,582	18	46	57
of which retail underlying	46	11	0	0	0
of which wholesale	22,593	2,571	18	46	57

SEC4 – Securitization exposures in the banking book and associated regulatory capital requirements – Credit Suisse acting as investor

	Exposure value (by RW band)				
end of	<=20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1250% RW	1250% RW
4Q18 (CHF million)					
Total exposures	**6,129**	**1,606**	**648**	**921**	**39**
Traditional securitization	5,854	1,606	648	900	39
of which securitization	5,854	1,606	648	900	39
of which retail underlying	3,667	1,375	470	735	24
of which wholesale	2,187	231	178	165	15
Synthetic securitization	275	0	0	21	0
of which securitization	275	0	0	21	0
of which wholesale	275	0	0	21	0
2Q18 (CHF million)					
Total exposures	**8,167**	**2,661**	**1,182**	**1,145**	**4**
Traditional securitization	7,890	2,661	1,182	1,125	4
of which securitization	7,890	2,661	1,182	1,125	4
of which retail underlying	5,272	2,644	1,182	1,067	4
of which wholesale	2,618	17	0	58	0
Synthetic securitization	277	0	0	20	0
of which securitization	277	0	0	20	0
of which wholesale	277	0	0	20	0

	Exposure value (by regulatory approach)				RWA (by regulatory approach)				Capital charge after cap			
	SEC-IRBA	SEC-ERBA	SEC-SA	1250% RW	SEC-IRBA	SEC-ERBA	SEC-SA	1250% RW	SEC-IRBA	SEC-ERBA	SEC-SA	1250% RW
	33,059	**1,441**	**4,277**	**46**	**6,304**	**1,036**	**991**	**573**	**504**	**83**	**79**	**46**
	3,497	1,441	4,247	2	692	1,036	976	24	55	83	78	2
	3,497	1,441	4,247	2	692	1,036	976	24	55	83	78	2
	184	1,241	4,237	0	69	586	960	0	5	47	77	0
	3,313	200	10	2	623	450	16	24	50	36	1	2
	29,562	0	30	44	5,612	0	15	549	449	0	1	44
	29,562	0	30	44	5,612	0	15	549	449	0	1	44
	541	0	0	1	83	0	0	9	7	0	0	1
	29,021	0	30	43	5,529	0	15	540	442	0	1	43
	29,426	**628**	**278**	**2**	**5,131**	**497**	**509**	**30**	**410**	**40**	**41**	**2**
	4,155	627	207	2	749	478	103	30	60	39	8	2
	4,155	627	207	2	749	478	103	30	60	39	8	2
	0	478	197	2	0	126	87	30	0	10	7	2
	4,155	149	10	0	749	352	16	0	60	29	1	0
	25,271	1	71	0	4,382	19	406	0	350	1	33	0
	25,271	1	71	0	4,382	19	406	0	350	1	33	0
	57	0	0	0	(686)	0	0	0	(55)	0	0	0
	25,214	1	71	0	5,068	19	406	0	405	1	33	0

	Exposure value (by regulatory approach)				RWA (by regulatory approach)				Capital charge after cap			
	SEC-IRBA	SEC-ERBA	SEC-SA	1250% RW	SEC-IRBA	SEC-ERBA	SEC-SA	1250% RW	SEC-IRBA	SEC-ERBA	SEC-SA	1250% RW
	1,786	**942**	**6,576**	**39**	**313**	**386**	**2,457**	**481**	**25**	**31**	**196**	**39**
	1,786	646	6,576	39	313	333	2,457	481	25	27	196	39
	1,786	646	6,576	39	313	333	2,457	481	25	27	196	39
	0	646	5,602	24	0	333	1,979	298	0	27	158	24
	1,786	0	974	15	313	0	478	183	25	0	38	15
	0	296	0	0	0	53	0	0	0	4	0	0
	0	296	0	0	0	53	0	0	0	4	0	0
	0	296	0	0	0	53	0	0	0	4	0	0
	2,602	**3,120**	**7,437**	**0**	**573**	**1,228**	**2,807**	**0**	**46**	**98**	**225**	**0**
	2,602	2,823	7,437	0	573	1,176	2,807	0	46	94	225	0
	2,602	2,823	7,437	0	573	1,176	2,807	0	46	94	225	0
	188	2,823	7,159	0	70	1,176	2,709	0	6	94	217	0
	2,414	0	278	0	503	0	98	0	40	0	8	0
	0	297	0	0	0	52	0	0	0	4	0	0
	0	297	0	0	0	52	0	0	0	4	0	0
	0	297	0	0	0	52	0	0	0	4	0	0

Market risk

General

We use the advanced approach for calculating the market risk capital requirements for the majority of our market risk exposures. The percentage of RWA covered by internal models as of December 31, 2018 was 87%. In line with regulatory requirements, the SMM is used for the specific risk of securitization exposures.

→ Refer to "Regulatory capital treatment of securitization structures" (pages 55 to 56) in Securitization – General for further information on the standardized measurement method and other supervisory approaches.

Risk management objectives and policies for market risk

→ Refer to "Market risk" (pages 155 to 158) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk coverage and management in the Credit Suisse Annual Report 2018 for information on our risk management objectives and policies for market risk.
→ Refer to "Note 1 – Summary of significant accounting policies" (pages 277 to 278) and "Note 32 – Derivatives and hedging activities" (pages 339 to 342) in VI – Consolidated financial statements – Credit Suisse Group in the Credit Suisse Annual Report 2018 for further information on policies for hedging risk and strategies/processes for monitoring the continuing effectiveness of hedges.

Market risk reporting

Market risk reporting is performed daily and there are documented internal control procedures. Senior management and the Board of Directors are informed about key market risk metrics, including VaR, ERC, key risks and top exposures with the monthly Group Risk Report.

Market risk under standardized approach

The following table shows the components of the capital requirement under the standardized approach for market risk.

MR1 – Market risk under standardized approach

end of	4Q18	2Q18
Risk-weighted assets (CHF million)		
Options		
Securitization	2,393	2,490
Total risk-weighted assets	**2,393**	**2,490**

Market risk under internal model approach

General

The market risk internal model approach (IMA) framework includes regulatory VaR, stressed VaR, risks not in VaR (RNIV) and Incremental Risk Charge (IRC). RNIV includes certain stressed RNIV. In 2014 Comprehensive Risk Measure was discontinued due to the small size of the correlation trading portfolio. We now use the standard rules for this portfolio.

The following table shows the main characteristics of the different models.

MRB – Internal model approach – overview

	Regulatory VaR	Stressed VaR	IRC
Method applied	Historical simulation	Historical simulation	Portfolio loss simulation
Data set	2 years	1 Year	–
Holding period	10 days (overlapping)	10 days (overlapping)	One-year liquidity horizon
Confidence level	99%	99%	99.9%
Population	Regulatory trading book (where applicable, foreign exchange and commodity risks in the regulatory banking book are added)	Regulatory trading book (where applicable, foreign exchange and commodity risks in the regulatory banking book are added)	Regulatory trading book subject to issuer default and migration risk (excl. securitizations and correlation trades)

The following table shows a breakdown of RWA covered by each of the models.

MRB – IMA – Risk-weighted assets

end of 4Q18	CHF billion	in %
Risk-weighted assets		
Regulatory VaR	3.5	21
Stressed VaR	5.8	35
RNIV	5.9	36
IRC	1.1	7
Total risk-weighted assets	**16.3**	**100**

Regulatory VaR, stressed VaR and risks not in VaR

The regulatory VaR and stressed VaR models cover primarily the activities of Credit Suisse's business units that are held within trading books. The model is predominantly based on historical simulation and includes risk factors covering equity, currency, interest rate, commodity and credit market risks. The model is also used to capture foreign exchange and commodity risk within banking books where required by the regulator.

In addition to the regulatory VaR and stressed VaR models Credit Suisse operates a RNIV framework. This is applied to the same activities as the VaR/stressed VaR model but covers risks that are not included in the model due e.g. to lack of historical data or other model constraints. The purpose of the RNIV framework is to ensure that capital is held to meet all risks which are not captured, or not captured adequately, by the firm's VaR and stressed VaR models. These include, but are not limited to risk factors such as cross-risks, basis risks and higher-order risks. The RNIV framework is also intended to cover event risks that could adversely affect the relevant business.

The objective of Credit Suisse is to ensure the greatest consistency possible between the model used for Group and that used for subsidiaries and other legal entities. The model used in all instances is based on the same historical simulation approach but precise configuration and inclusion of risk factors may differ due to a variety of factors. These include timing differences in receiving the necessary regulatory approvals (in which case the differences may be temporary) or different supervisory requirements or interpretations (in which case the differences may be expected to remain).

The Group model is used for Credit Suisse AG (consolidated and parent company), Credit Suisse (Schweiz) AG, Neue Aargauer Bank AG and Credit Suisse (Hong Kong) Ltd. The model used for Credit Suisse Holdings (USA), Credit Suisse Capital LLC, Credit Suisse International and Credit Suisse Securities (Europe) Limited is similar but is based on a straight percentile rather than expected shortfall.

The main approach of the model is to use historical simulation. This is a generally accepted approach to regulatory VaR. The stressed VaR model is based on an observation period of 1 year and relates to a period of significant financial stress. The market data in the model is updated on an at least weekly basis (some current rates/spreads required by the model are updated on a daily basis). Expected shortfall is the preferred tail measure where permitted and is calibrated to be equivalent to a 99% confidence level.

The risk management VaR model for the Group is similar to the regulatory VaR model with a few differences. Certain positions excluded from regulatory and stressed VaR can be included for risk management purposes, such as specific risk from securitization positions and certain banking book exposures. The holding period for risk management VaR is 1 day. The tail measure for risk management is calibrated to be equivalent to a 98% confidence level rather than the regulatory 99%.

The regulatory VaR model for the Group and its entities uses a two-year lookback window and an exponential weighting scheme is applied. The exponential weighting is applied to the profits and losses (P&L) vector prior to computing the tail estimate and the weighting is calibrated subject to constraints imposed by the regulations. The model does not use scaled 1-day returns but actual 10 day overlapping returns. The return methodology (e.g. absolute, proportional or another functional form) is documented and varies by risk type and it is reviewed on a periodic basis. The P&L vectors are generated using a variety of approaches; Taylor Series approximation, revaluation ladders and grids as well as full revaluation, depending on the complexity and linearity of the underlying risks.

The stressed VaR model for the Group and its entities uses an actual 10 day return calculated over a 1 year historical observation period with no exponential weighting applied, except of Credit Suisse Holdings (USA) where stressed VaR uses regulatory VaR time weighting parameters. The underlying risk factors are simulated using the same approaches as for regulatory VaR. The 1 year period of stress is assessed on a monthly basis by calculating stressed VaR for different alternative 1 year periods for recent portfolios.

The model is an integrated approach to general and specific risk. Where regression approaches are used a residual component may be aggregated with the pure historical simulation approach using a Gaussian assumption (zero correlation). Alternative approaches to aggregation including RNIV may be used where the zero correlation assumption cannot be justified.

The performance of our internal models is regularly monitored and discussed at internal risk governance committees which review the regulatory backtesting results in addition to internal metrics of model performance. Position information flowing into the VaR model is reviewed daily, historical market data is reviewed before going live on a weekly basis, and model parameters are reviewed regularly.

Due to the nature of the historical simulation approach there is comparably little reliance on exogenous modelling parameters, beyond the process to identify the correct stressed VaR period, and the calibration of the model data to that period. No additional stress testing of the model parameters is performed.

→ Refer to "Market risk" (pages 155 to 158) and "Market risk review" (pages 170 to 173) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management in the Credit Suisse Annual Report 2018 for further information on VaR, including VaR limitations, VaR backtesting, stress testing, VaR governance and differences between the model used for risk management purposes and the model used for regulatory purposes.

Incremental Risk Charge

The IRC capitalizes issuer default and migration risk in the trading book, arising from positions such as bonds or CDS, but excluding securitizations and correlation trading. Credit Suisse has received approval from FINMA, as well as from regulators of several of our subsidiaries, to use our IRC model.

The IRC model assesses risk at 99.9% confidence level over a one-year time horizon assuming the Constant Position Assumption, i.e. a single liquidity horizon of one year. This corresponds to the most conservative assumption on liquidity that is available under current IRC regulatory rules.

The IRC portfolio model is a Merton-type portfolio model designed to calculate the cumulative loss at the 99.9% confidence level. The model's design is based on the same principles as industry standard credit portfolio models including the Basel II A-IRB model.

As part of the exposure aggregation model, stochastic recovery rates are used to capture recovery rate uncertainty, including the case of basis risks on default, where different instruments issued by the same issuer can experience different recovery rates.

Recently, Credit Suisse has proposed to refine the capture of systematic risks in the IRC model by expanding the asset correlation framework into a multifactor set-up, which is live for entities regulated by the Prudential Regulation Authority, and going through approval process with FINMA.

To achieve the IRB soundness standard, Credit Suisse uses IRC parameters that are either based on the A-IRB reference data sets (migration matrices including PDs, LGDs, LGD correlation and volatility), or parameters based on other internal or external data qualifying under the IRB data quality criteria, such as data used for indices published by Credit Suisse.

RWA flow statements of market risk exposures under an IMA

The following table presents the 4Q18 flow statement explaining variations in the market risk RWA determined under an internal model approach.

Market risk RWA under an IMA of CHF 16.3 billion increased 5% compared to the end of 3Q18, primarily due to the increase in regulatory VaR, driven by model and parameter updates.

MR2 – Risk-weighted assets flow statements of market risk exposures under an IMA

4Q18	Regulatory VaR	Stressed VaR	IRC	Other [1]	Total RWA
CHF million					
Risk-weighted assets at beginning of period	**1,941**	**4,762**	**2,393**	**6,437**	**15,533**
Regulatory adjustment	233	1,642	(1,614)	(475)	(214)
Risk-weighted assets at beginning of period (end of day)	**2,174**	**6,404**	**779**	**5,962**	**15,319**
Movement in risk levels	(353)	(152)	78	90	(337)
Model and parameter updates	2,697	(13)	(11)	(322)	2,351
Foreign exchange impact	2	12	26	42	82
Risk-weighted assets at end of period (end of day)	**4,520**	**6,251**	**872**	**5,772**	**17,415**
Regulatory adjustment	(1,044)	(484)	269	94	(1,165)
Risk-weighted assets at end of period	**3,476**	**5,767**	**1,141**	**5,866**	**16,250**

1 Risks not in VaR.

The following table presents the definitions of the RWA flow statements components for market risk.

Definitions of risk-weighted assets movement components related to market risk

Description	Definition
RWA as of the end of the previous/current reporting periods	Represents RWA at quarter-end
Regulatory adjustment	Indicates the difference between RWA and RWA (end of day) at beginning and end of period
RWA as of the previous/current quarters end (end of day)	For a given component (e.g. VaR) it refers to the RWA that would be computed if the snapshot quarter end figure of the component determines the quarter end RWA, as opposed to a 60-day average for regulatory
Movement in risk levels	Represents movements due to position changes
Model and parameter updates	Represents movements arising from updates to models and recalibrations of parameters and internal changes impacting how exposures are treated
Methodology and policy changes	Represents movements due to methodology changes in calculations driven by regulatory policy changes, including both revisions to existing regulations and new regulations
Acquisitions and disposals	Represents changes in book sizes due to acquisitions and disposals of entities
Foreign exchange impact	Represents changes in exchange rates of the transaction currencies compared to the Swiss franc
Other	Represents changes that cannot be attributed to any other category

Internal model approach values for trading portfolios

The following table shows the values (maximum, minimum, average and period ending for the reporting period) resulting from the different types of models used for computing regulatory capital charge at the Group level, before any additional capital charge is applied.

MR3 – Regulatory VaR, stressed VaR and Incremental Risk Charge

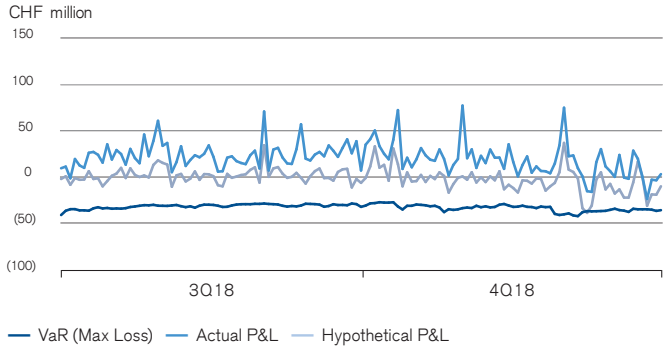
in / end of	**2H18**	1H18
CHF million		
Regulatory VaR (10 day 99%)		
Maximum value	149	103
Average value	71	74
Minimum value	44	51
Period end	121	83
Stressed VaR (10 day 99%)		
Maximum value	188	195
Average value	141	142
Minimum value	89	111
Period end	167	170
IRC (99.9%)		
Maximum value	304	284
Average value	137	175
Minimum value	30	90
Period end	70	109

During 2H18, the regulatory VaR increase was mainly driven by market data update and the IRC decrease was mainly driven by loan data attributes update in Global Markets.

Comparison of VaR estimates with gains/losses

The following chart compares the results of estimates from the regulatory VaR model with both hypothetical and actual trading outcomes.

MR4 – Comparison of VaR estimates with actual/hypothetical profits and losses



Backtesting involves comparing the results produced by the VaR model with the hypothetical trading revenues on the trading book. Hypothetical trading revenues are defined in compliance with regulatory requirements and aligned with the VaR model output by excluding (i) non-market elements (such as fees, commissions, cancellations and terminations, net cost of funding and credit-related valuation adjustments) and (ii) gains and losses from intra-day trading. A backtesting exception occurs when a hypothetical trading loss exceeds the daily VaR estimate.

For capital purposes and in line with Bank for International Settlements (BIS) requirements, FINMA increases the capital multiplier for every regulatory VaR backtesting exception above four in the prior rolling 12-month period, resulting in an incremental market risk capital requirement for the Group. VaR models with less than five backtesting exceptions are considered by regulators to be classified in a defined “green zone”. The “green zone” corresponds to backtesting results that do not themselves suggest a problem with the quality or accuracy of a bank’s model.

In 2H18, we had one backtesting exceptions in our regulatory VaR model calculated using hypothetical trading revenues.

Since there were fewer than five backtesting exceptions in the rolling 12-month period through the end of 4Q18, in line with BIS industry guidelines, the VaR model is deemed to be statistically valid.

Interest rate risk in the banking book

Overview

The Group monitors and manages interest rate risk in the banking book by established systems, processes and controls. Risk sensitivity figures are provided to estimate the impact of changes in interest rates, which is one of the primary ways in which these risks are assessed for risk management purposes. In addition, Risk Division confirms that the economic impacts of adverse parallel shifts in interest rates of 200 basis points are significantly below the threshold of 20% of eligible regulatory capital used by the regulator to identify banks that potentially run excessive levels of banking book interest rate risk. Given the low level of interest rate risk in the banking book, the Group does not have any regulatory requirement to hold capital against this risk.

Major sources of interest rate risk in the banking book

The interest rate risk exposures in the non-trading positions (synonymously used to the term "banking book") mainly arise from the retail/private banking activities, the positioning strategy with respect to our replicated non-interest bearing assets and liabilities (including the equity balance) and the outstanding capital instruments. The vast majority of interest rate risk in the banking book is managed on a portfolio basis.

The interest rate risk from retail/private banking activities results from the transactions with repricing maturities that either are or are not contractually determined. For most parts of the latter, such as variable rate mortgages and some types of deposits, which do not have a direct link to market rates in their repricing behavior, it is more suitable to manage them on a portfolio basis rather than on individual trade level. The interest rate risk associated with these products, referred to as non-maturing products, is estimated using the methodology of replicating portfolios: Based on the historical and expected behavior of interest rates and volume of these products it assigns the position balance associated with a non-maturing banking product to time bands that are presumed to reflect their empirical repricing maturities. The methodology is based, where reasonably possible, on the principle of finding a stable relationship between the changes of client rates of the non-maturing products and an underlying investment or funding portfolio. These allocations to time bands can then be used to evaluate the products' interest rate sensitivity. The structure and parameters of the replicating portfolios are reviewed periodically to ensure continued relevance of the portfolios in light of changing market conditions and client behavior.

Changing market rates give rise to changes in the fair values of the outstanding capital instruments that have been issued for funding of the bank. To some extent, on an individual basis, this risk is being mitigated by using swaps to replace fixed payment obligations into floating ones. In addition to these transactions on individual basis, the residual interest rate risk is also managed holistically by Treasury.

Governance of models and limits

The majority of interest rate risk in the banking book is managed centrally within approved limits using hedging instruments such as interest rate swaps. The Board of Directors defines the risk appetite, i.e. a set of risk limits, for the Group on an annual basis. Limits to the divisions are governed by the CARMC; the divisional Risk Management Committees may assign limits on more granular levels for entities, businesses, books, collections of books. The models used for measuring risk are reviewed and approved by the RPSC, where the frequency depends on the criticality of the model. Operational decisions on the use of the models (e.g. in terms of maximum tenor and allocation of tranches to the time bands in the replicating portfolios) is governed by the CARMC. For interest rate risk in the banking book, Risk Department is responsible for monitoring the limit usage and escalating potential limit breaches.

Risk measurement

The risks associated with the non-trading interest rate-sensitive portfolios are measured using a range of tools, including the following key metrics:

- Interest rate sensitivity (DV01): Expresses the linear approximation of the impact on a portfolio's fair value resulting from a one basis point (0.01%) parallel shift in yield curves, where the approximation tends to be closer to the true change in the portfolio's fair value for smaller parallel shifts in the yield curve. The DV01 is a transparent and intuitive indicator of linear directional interest rate risk exposure, which does not rely on statistical inference.
- Economic value scenario analysis: Expresses the impact of a pre-defined scenario (e.g. instantaneous changes in interest rates) on a portfolio's fair value. This metric does not rely on statistical inference.
- Net interest income (NII) analysis: The NII risk measures are used to assess the change in the NII over a specified time horizon compared to the NII base line scenario. The NII risk measures can be based on either constant or dynamic balance sheet assumptions.

The first two measures listed above focus on the impact on an economic value basis, taking into account the present value of all future cash flows associated with the current positions. More specifically, the metrics estimate the impact on the economic value of the current portfolio, ignoring dynamic aspects such as the time schedule of how changes in economic value materialize in accounting P&L (since most non-trading books are not marked-to-market) and the development of the portfolio over time. These two measures are complemented by considering an Earnings-at-Risk approach to interest rate risk: For the major part of the banking books, this is accomplished by simulating the development of the NII over several years using scenarios of potential changes of the yield curves and product volumes. This scenario analysis also takes into account the earnings impact originating

from fluctuations in short term interest rates, which are regarded as riskless when analyzing the impact on economic value.

Monitoring and review

The limits and flags defined by books, collections of books, businesses or legal entities relating to interest rate risk in the banking book are monitored by Risk Department at least on a monthly basis (if deemed necessary or suitable, the monitoring may be as frequent as daily), by using the metrics and methodologies outlined above. In case of breaches, this is escalated to the limit-setting body. The Group assesses compliance with regulatory requirements regarding appropriate levels of non-trading interest rate risk by estimating the economic impact of adverse 200 basis point parallel shifts in yield curves and adverse interest rate shifts and then relating those impacts to the total eligible regulatory capital. Consistent with regulatory requirements, Risk Division ensures that the economic value impact of this analysis is below the threshold of 20% of eligible regulatory capital in which case there are no requirements to hold additional capital. This analysis is performed for the Group and major legal entities, including the Bank, on a monthly basis.

Risk profile

→ Refer to "Banking book" (pages 172 to 173) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Risk management – Risk review and results in the Credit Suisse Annual Report 2018 for information on the impact of a one basis point parallel increase of the yield curves and an adverse 200 basis point move in yield curves on the fair value of interest rate-sensitive banking book positions.

Additional regulatory disclosures

Composition of capital

Credit Suisse is a systemically important financial institution.

→ Refer to "Swiss capital requirements" (pages 4 to 5) for the systemically important financial institution view.

The following required tables provide details on the composition of Swiss regulatory capital including common equity tier 1 (CET1) capital, additional tier 1 capital and tier 2 capital as if the Group was not a systemically important financial institution.

CC1 – Composition of regulatory capital

end of 4Q18		Amounts	Reference [1]
Swiss CET1 capital (CHF million)			
1	Directly issued qualifying common share (and equivalent for non-joint stock companies) capital plus related stock surplus	34,990	1
2	Retained earnings	26,943	2
3	Accumulated other comprehensive income (and other reserves) [2]	(18,011)	3
6	**CET1 capital before regulatory adjustments**	**43,922**	
8	Goodwill, net of tax	(4,762)	4
9	Other intangible assets (excluding mortgage servicing rights), net of tax	(47)	5
10	Deferred tax assets that rely on future profitability (excluding temporary differences), net of tax	(1,647)	6
11	Cash flow hedge reserve	64	
12	Shortfall of provisions to expected losses	(461)	
14	Gains/(losses) due to changes in own credit on fair-valued liabilities	804	
15	Defined-benefit pension assets	(1,374)	7
16	Investments in own shares	(32)	
21	Deferred tax assets arising from temporary differences (amount above 10% threshold, net of tax)	0	8
26b	National specific regulatory adjustments	(748)	
28	**Total regulatory adjustments to CET1 capital**	**(8,203)**	
29	**CET1 capital**	**35,719**	
30	Directly issued qualifying additional tier 1 instruments plus related stock surplus [3]	10,237	
32	of which classified as liabilities under applicable accounting standards	10,237	9
36	**Additional tier 1 capital before regulatory adjustments**	**10,237**	
37	Investments in own additional tier 1 instruments	(21)	
43	**Total regulatory adjustments to additional tier 1 capital**	**(21)**	
44	**Additional tier 1 capital**	**10,216**	
Swiss tier 1 capital (CHF million)			
45	**Tier 1 capital**	**45,935**	
Swiss tier 2 capital (CHF million)			
46	Directly issued qualifying tier 2 instruments plus related stock surplus [4]	3,512	10
47	Directly issued capital instruments subject to phase-out from tier 2 capital	691	11
51	**Tier 2 capital before regulatory adjustments**	**4,203**	
52	Investments in own tier 2 instruments and other TLAC liabilities	(4)	
57	**Total regulatory adjustments to tier 2 capital**	**(4)**	
58	**Tier 2 capital**	**4,199**	
Swiss eligible capital (CHF million)			
59	**Total eligible capital**	**50,134**	

1 Refer to the balance sheet under regulatory scope of consolidation in the table "CC2 – Reconciliation of regulatory capital to balance sheet". Only material items are referenced to the balance sheet.

2 Includes treasury shares.

3 Consists of high-trigger and low-trigger capital instruments. Of this amount, CHF 5.6 billion consists of capital instruments with a capital ratio write-down trigger of 7% and CHF 4.6 billion consists of capital instruments with a capital ratio write-down trigger of 5.125%.

4 Consists of low-trigger capital instruments with a capital ratio write-down trigger of 5%.

CC1 – Composition of regulatory capital (continued)

end of 4Q18		Amounts	Reference [1]
Swiss risk-weighted assets (CHF million)			
60	Risk-weighted assets	**285,193**	
Swiss risk-based capital ratios as a percentage of risk-weighted assets (%)			
61	CET1 capital ratio	12.5	
62	Tier 1 capital ratio	16.1	
63	Total capital ratio	17.6	
BIS CET1 buffer requirements (%) [2]			
64	Total BIS CET buffer requirement	3.09	
65	of which capital conservation buffer [3]	1.875	
66	of which extended countercyclical buffer	0.09	
67	of which progressive buffer for G-SIB and/or D-SIB [3]	1.125	
68	CET1 capital available after meeting the bank's minimum capital requirements [4]	8.0	
Amounts below the thresholds for deduction (before risk weighting) (CHF million)			
72	Non-significant investments in the capital and other TLAC liabilities of other financial entities	2,498	
73	Significant investments in the common stock of financial entities	816	
74	Mortgage servicing rights, net of tax	135	
75	Deferred tax assets arising from temporary differences, net of tax	3,492	
Applicable caps on the inclusion of provisions in tier 2 (CHF million)			
77	Cap on inclusion of provisions in tier 2 under standardized approach	92	
79	Cap for inclusion of provisions in tier 2 under internal ratings-based approach	894	
Capital instruments subject to phase-out arrangements (CHF million)			
84	Current cap on tier 2 instruments subject to phase-out arrangements	691	

1 Refer to the balance sheet under regulatory scope of consolidation in the table "CC2 – Reconciliation of regulatory capital to balance sheet". Only material items are referenced to the balance sheet.
2 CET1 buffer requirements are based on BIS requirements as a percentage of Swiss risk-weighted assets.
3 Reflects the phase-in requirement.
4 Reflects the CET1 capital ratio of 12.5%, less the BIS minimum CET1 ratio requirement of 4.5%.

The following table shows the balance sheet as published in the consolidated financial statements of the Group and the balance sheet under the regulatory scope of consolidation.

→ Refer to "Linkages between financial statements and regulatory disclosures" (pages 8 to 9) for information on key differences between the accounting and the regulatory scope of consolidation.

CC2 – Reconciliation of regulatory capital to balance sheet

end of 4Q18	Financial statements	Regulatory scope of consolidation	Reference to composition of capital
Assets (CHF million)			
Cash and due from banks	100,047	99,827	
Interest-bearing deposits with banks	1,142	1,461	
Central bank funds sold, securities purchased under resale agreements and securities borrowing transactions	117,095	117,095	
Securities received as collateral, at fair value	41,696	41,696	
Trading assets, at fair value	132,203	126,936	
Investment securities	2,911	1,479	
Other investments	4,890	4,971	
Net loans	287,581	288,215	
Premises and equipment	4,838	4,904	
Goodwill	4,766	4,770	4
Other intangible assets	219	219	
of which other intangible assets (excluding mortgage servicing rights)	56	56	5
Brokerage receivables	38,907	38,907	
Other assets	32,621	31,843	
of which deferred tax assets related to net operating losses	1,647	1,647	6
of which deferred tax assets from temporary differences	3,296	3,292	8
of which defined-benefit pension fund net assets	1,794	1,794	7
Total assets	**768,916**	**762,323**	
Liabilities and equity (CHF million)			
Due to banks	15,220	16,032	
Customer deposits	363,925	363,828	
Central bank funds purchased, securities sold under repurchase agreements and securities lending transactions	24,623	30,277	
Obligation to return securities received as collateral, at fair value	41,696	41,696	
Trading liabilities, at fair value	42,169	42,212	
Short-term borrowings	21,926	16,536	
Long-term debt	154,308	152,058	
Brokerage payables	30,923	30,923	
Other liabilities	30,107	24,635	
Total liabilities	**724,897**	**718,197**	
of which additional tier 1 instruments, fully eligible	10,162	10,216	9
of which tier 2 instruments, fully eligible	4,022	3,508	10
of which tier 2 instruments subject to phase-out	2,394	691	11
Common shares	102	102	1
Additional paid-in capital	34,889	34,888	1
Retained earnings	26,973	26,943	2
Treasury shares, at cost	(61)	(59)	3
Accumulated other comprehensive income/(loss)	(17,981)	(17,952)	3
Total shareholders' equity [1]	**43,922**	**43,922**	
Noncontrolling interests [2]	97	204	
Total equity	**44,019**	**44,126**	
Total liabilities and equity	**768,916**	**762,323**	

1 Eligible as CET1 capital, prior to regulatory adjustments.

2 The difference between the accounting and regulatory scope of consolidation primarily represents private equity and other fund type vehicles, which FINMA does not require to consolidate for capital adequacy reporting.

Key prudential metrics

Most line items in the following table reflects the view as if the Group was not a systemically important financial institution.

KM1 – Key metrics

end of	4Q18
Capital (CHF million)	
Swiss CET1 capital	35,719
Swiss tier 1 capital	45,935
Swiss total eligible capital	50,134
Minimum capital requirement (8% of Swiss risk-weighted assets) [1]	22,815
Risk-weighted assets (CHF million)	
Swiss risk-weighted assets	285,193
Risk-based capital ratios as a percentage of risk-weighted assets (%)	
Swiss CET1 capital ratio	12.5
Swiss tier 1 capital ratio	16.1
Swiss total capital ratio	17.6
BIS CET1 buffer requirements (%) [2]	
Capital conservation buffer [3]	1.875
Extended countercyclical buffer	0.09
Progressive buffer for G-SIB and/or D-SIB [3]	1.125
Total BIS CET1 buffer requirement	3.09
CET1 capital available after meeting the bank's minimum capital requirements [4]	8.0
Basel III leverage ratio (CHF million)	
Leverage exposure	881,386
Basel III leverage ratio (%)	5.2
Liquidity coverage ratio (CHF million)	
Numerator: total high quality liquid assets	161,231
Denominator: net cash outflows	87,811
Liquidity coverage ratio (%) [5]	184

The new current expected credit loss (CECL) model under US GAAP will become effective for Credit Suisse as of January 1, 2020.

1 Calculated as 8% of Swiss risk-weighted assets, based on total capital minimum requirements, excluding the BIS CET1 buffer requirements.

2 CET1 buffer requirements are based on BIS requirements as a percentage of Swiss risk-weighted assets.

3 Reflects the phase-in requirement.

4 Reflects the CET1 capital ratio of 12.5%, less the BIS minimum CET1 ratio requirement of 4.5%.

5 Calculated using a three-month average, which is calculated on a daily basis.

→ Refer to "Swiss capital requirements" (pages 4 to 5) for the systemically important financial institution view.

→ Refer to "Swiss metrics" (pages 135 to 136) and "Risk-weighted assets" (pages 131 to 133) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Capital management in the Credit Suisse Annual Report 2018 for further information on movements in capital, capital ratios, risk-weighted assets and leverage ratios.

→ Refer to "Liquidity coverage ratio" (page 117) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Liquidity and funding management – Liquidity management in the Credit Suisse Annual Report 2018 for further information on movements in liquidity coverage ratio.

→ Refer to "Swiss requirements" (pages 123 to 126) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Capital management – Regulatory framework in the Credit Suisse Annual Report 2018 for further information on additional CET1 buffer requirements.

Macroprudential supervisor measures

The following table provides an overview of the geographical distribution of RWA for private sector credit exposures used in the calculation of the extended countercyclical buffer (CCyB).

CCyB1 – Geographical distribution of risk-weighted assets used in the CCyB

end of 4Q18	CCyB rate (%)	RWA used in the computation of the CCyB	Bank-specific CCyB rate (%)	CCyB amount
CHF million, except where indicated				
Hong Kong	1.875	3,060	–	–
Sweden	1.875	394	–	–
UK	1.0	9,468	–	–
Subtotal	–	**12,922**	–	–
Other countries	0.0	164,020		
Total [1]	**–**	**176,942**	**0.09**	**159**

1 Reflects the total of RWA for private sector credit exposures across all jurisdictions to which the Group is exposed, including jurisdictions with no CCyB rate or with a CCyB rate set at zero, and value of the Group specific CCyB rate and resulting CCyB amount.

Leverage metrics

Beginning in 1Q15, Credit Suisse adopted the BIS leverage ratio framework, as issued by the BCBS and implemented in Switzerland by FINMA.

→ Refer to "Leverage metrics" (page 134) and "Swiss metrics" (pages 135 to 136) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Capital management in the Credit Suisse Annual Report 2018 for further information on leverage metrics, including the calculation methodology and movements in leverage exposures.

LR1 – Summary comparison of accounting assets vs leverage ratio exposure

end of	4Q18
Reconciliation of consolidated assets to leverage exposure (CHF million)	
Total consolidated assets as per published financial statements	768,916
Adjustment for investments in banking, financial, insurance or commercial entities that are consolidated for accounting purposes but outside the scope of regulatory consolidation [1]	(12,655)
Adjustments for derivatives financial instruments	73,110
Adjustments for SFTs (i.e. repos and similar secured lending)	(32,278)
Adjustments for off-balance sheet items (i.e. conversion to credit equivalent amounts of off-balance sheet exposures)	84,293
Total leverage exposure	**881,386**

1 Includes adjustments for investments in banking, financial, insurance or commercial entities that are consolidated for accounting purposes but outside the scope of regulatory consolidation and tier 1 capital deductions related to balance sheet assets.

LR2 – Leverage ratio common disclosure template

end of	4Q18
Reconciliation of consolidated assets to leverage exposure (CHF million)	
On-balance sheet items (excluding derivatives and SFTs, but including collateral)	569,381
Asset amounts deducted from Basel III tier 1 capital	(8,491)
Total on-balance sheet exposures	**560,890**
Reconciliation of consolidated assets to leverage exposure (CHF million)	
Replacement cost associated with all derivatives transactions (i.e. net of eligible cash variation margin)	22,841
Add-on amounts for PFE associated with all derivatives transactions	71,473
Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the operative accounting framework	20,288
Deductions of receivables assets for cash variation margin provided in derivatives transactions	(18,982)
Exempted CCP leg of client-cleared trade exposures	(11,553)
Adjusted effective notional amount of all written credit derivatives	186,012
Adjusted effective notional offsets and add-on deductions for written credit derivatives	(178,623)
Derivative Exposures	**91,456**
Securities financing transaction exposures (CHF million)	
Gross SFT assets (with no recognition of netting), after adjusting for sale accounting transactions	158,451
Netted amounts of cash payables and cash receivables of gross SFT assets	(23,122)
Counterparty credit risk exposure for SFT assets	10,165
Agent transaction exposures	(747)
Securities financing transaction exposures	**144,747**
Other off-balance sheet exposures (CHF million)	
Off-balance sheet exposure at gross notional amount	257,755
Adjustments for conversion to credit equivalent amounts	(173,462)
Other off-balance sheet exposures	**84,293**
Swiss tier 1 capital (CHF million)	
Swiss tier 1 capital	**45,935**
Leverage exposure (CHF million)	
Total leverage exposure	**881,386**
Leverage ratio (%)	
Basel III leverage ratio	**5.2**

Liquidity

Liquidity risk management framework

Our liquidity and funding policy is designed to ensure that funding is available to meet all obligations in times of stress, whether caused by market events or issues specific to Credit Suisse.

→ Refer to "Liquidity and funding management" (pages 114 to 121) in III – Treasury, Risk, Balance sheet and Off-balance sheet in the Credit Suisse Annual Report 2018 for further information on our liquidity risk management framework including governance, stress testing, liquidity metrics, funding sources and uses and contractual maturity of assets and liabilities.

Liquidity coverage ratio

Our calculation methodology for the liquidity coverage ratio (LCR) is prescribed by FINMA. For disclosure purposes our LCR is calculated using a three-month average which, beginning in 1Q17, is measured using daily calculations during the quarter rather than the month-end metrics used before. This change in the LCR averaging methodology resulted from updated FINMA requirements that became effective January 1, 2018.

→ Refer to "Liquidity metrics" (pages 116 to 117) and "Funding sources" (pages 118 to 119) in III – Treasury, Risk, Balance sheet and Off-balance sheet – Liquidity and funding management in the Credit Suisse Annual Report 2018 for further information on the Group's liquidity coverage ratio including high quality liquid assets, liquidity pool and funding sources.

LIQ1 – Liquidity coverage ratio

end of 4Q18	Unweighted value [1]	Weighted value [2]
High Quality Liquid Assets (CHF million)		
High quality liquid assets	**–**	**161,231**
Cash outflows (CHF million)		
Retail deposits and deposits from small business customers	159,648	20,765
of which less stable deposits	159,648	20,765
Unsecured wholesale funding	219,615	89,065
of which operational deposits (all counterparties) and deposits in networks of cooperative banks	37,971	9,493
of which non-operational deposits (all counterparties)	107,740	62,240
of which unsecured debt	16,421	16,421
Secured wholesale funding	–	54,879
Additional requirements	166,741	36,921
of which outflows related to derivative exposures and other collateral requirements	60,163	15,507
of which outflows related to loss of funding on debt products	1,078	1,078
of which credit and liquidity facilities	105,500	20,336
Other contractual funding obligations	65,526	65,526
Other contingent funding obligations	202,457	5,391
Total cash outflows	**–**	**272,547**
Cash inflows (CHF million)		
Secured lending	131,204	85,678
Inflows from fully performing exposures	67,514	31,785
Other cash inflows	67,273	67,273
Total cash inflows	**265,991**	**184,736**
Liquidity cover ratio		
High quality liquid assets (CHF million)	–	161,231
Net cash outflows (CHF million)	–	87,811
Liquidity coverage ratio (%)	**–**	**184**

Calculated using a three-month average, which is calculated on a daily basis.

1 Calculated as outstanding balances maturing or callable within 30 days.

2 Calculated after the application of haircuts for high quality liquid assets or inflow and outflow rates.

List of abbreviations

A	
ABS	Asset-backed securities
ACVA	Advanced credit valuation adjustment approach
A-IRB	Advanced-Internal Ratings-Based Approach
AMA	Advanced Measurement Approach
B	
BCBS	Basel Committee on Banking Supervision
BFI	Banking, financial and insurance
BIS	Bank for International Settlements
C	
CAO	Capital Adequacy Ordinance
CARMC	Capital Allocation & Risk Management Committee
CCF	Credit Conversion Factor
CCO	Chief Credit Officer
CCP	Central counterparties
CCR	Counterparty credit risk
CCyB	Countercyclical buffer
CDO	Collateralized debt obligation
CDS	Credit default swap
CET1	Common equity tier 1
CLO	Collateralized loan obligation
CMBS	Commercial mortgage-backed securities
CMSC	Credit Model Steering Committee
CRM	Credit Risk Mitigation
CVA	Credit valuation adjustment
D	
D-SIB	Domestic systemically important banks
E	
EAD	Exposure at default
ECAI	External credit assessment institutions
EEPE	Effective Expected Positive Exposure
EMIR	European Market Infrastructure Regulation
ERC	Economic Risk Capital
F	
FINMA	Swiss Financial Market Supervisory Authority FINMA
F-IRB	Foundation-Internal Ratings-Based Approach
G	
GDP	Gross Domestic Product
G-SIB	Global systemically important banks
I	
IAA	Internal Assessment Approach
IMA	Internal Models Approach
IMM	Internal Models Method
IPRE	Income producing real estate
IRB	Internal Ratings-Based Approach
IRC	Incremental Risk Charge
L	
LCR	Liquidity coverage ratio
LGD	Loss given default
LRD	Leverage ratio denominator
LTV	Loan-to-value
N	
NII	Net interest income
O	
OTC	Over-the-counter
P	
P&L	Profits and losses
PD	Probability of default
PFE	Potential future exposure
Q	
QCCP	Qualifying central counterparty
R	
RBA	Ratings-Based Approach
RPSC	Risk Processes & Standards Committee
RW	Risk weight
RWA	Risk-weighted assets
S	
SA	Standardized Approach
SA-CCR	Standardized Approach – counterparty credit risk
SEC-ERBA	Securitization External Ratings-Based Approach
SEC-IRBA	Securitization Internal Ratings-Based Approach
SEC-SA	Securitization Standardized Approach
SFA	Supervisory Formula Approach
SFT	Securities Financing Transactions
SPE	Special purpose entity
T	
TLAC	Total loss absorbing capacity
U	
US GAAP	Accounting principles generally accepted in the US
V	
VaR	Value-at-Risk

Cautionary statement regarding forward-looking information

This document contains statements that constitute forward-looking statements. In addition, in the future we, and others on our behalf, may make statements that constitute forward-looking statements. Such forward-looking statements may include, without limitation, statements relating to the following:

- our plans, targets or goals;
- our future economic performance or prospects;
- the potential effect on our future performance of certain contingencies; and
- assumptions underlying any such statements.

Words such as "believes," "anticipates," "expects," "intends" and "plans" and similar expressions are intended to identify forward-looking statements but are not the exclusive means of identifying such statements. We do not intend to update these forward-looking statements.

By their very nature, forward-looking statements involve inherent risks and uncertainties, both general and specific, and risks exist that predictions, forecasts, projections and other outcomes described or implied in forward-looking statements will not be achieved. We caution you that a number of important factors could cause results to differ materially from the plans, targets, goals, expectations, estimates and intentions expressed in such forward-looking statements. These factors include:

- the ability to maintain sufficient liquidity and access capital markets;
- market volatility and interest rate fluctuations and developments affecting interest rate levels;
- the strength of the global economy in general and the strength of the economies of the countries in which we conduct our operations, in particular the risk of continued slow economic recovery or downturn in the EU, the US or other developed countries or in emerging markets in 2019 and beyond;
- the direct and indirect impacts of deterioration or slow recovery in residential and commercial real estate markets;
- adverse rating actions by credit rating agencies in respect of us, sovereign issuers, structured credit products or other credit-related exposures;
- the ability to achieve our strategic goals, including those related to our targets and financial goals;
- the ability of counterparties to meet their obligations to us;
- the effects of, and changes in, fiscal, monetary, exchange rate, trade and tax policies, as well as currency fluctuations;
- political and social developments, including war, civil unrest or terrorist activity;
- the possibility of foreign exchange controls, expropriation, nationalization or confiscation of assets in countries in which we conduct our operations;
- operational factors such as systems failure, human error, or the failure to implement procedures properly;
- the risk of cyber attacks, information or security breaches or technology failures on our business or operations;
- the adverse resolution of litigation, regulatory proceedings and other contingencies;
- actions taken by regulators with respect to our business and practices and possible resulting changes to our business organization, practices and policies in countries in which we conduct our operations;
- the effects of changes in laws, regulations or accounting or tax standards, policies or practices in countries in which we conduct our operations;
- the potential effects of changes in our legal entity structure;
- competition or changes in our competitive position in geographic and business areas in which we conduct our operations;
- the ability to retain and recruit qualified personnel;
- the ability to maintain our reputation and promote our brand;
- the ability to increase market share and control expenses;
- technological changes;
- the timely development and acceptance of our new products and services and the perceived overall value of these products and services by users;
- acquisitions, including the ability to integrate acquired businesses successfully, and divestitures, including the ability to sell non-core assets; and
- other unforeseen or unexpected events and our success at managing these and the risks involved in the foregoing.

We caution you that the foregoing list of important factors is not exclusive. When evaluating forward-looking statements, you should carefully consider the foregoing factors and other uncertainties and events, including the information set forth in "Risk factors" in I – Information on the company in our Annual Report 2018.

CREDIT SUISSE GROUP
Paradeplatz 8
8070 Zurich
Switzerland
credit-suisse.com