Zürcher Kantonalbank

Capital adequacy and liquidity disclosure requirements

Disclosure as at 31 December 2021

Publication date: 28 April 2022

Contents

1 Key abbreviations in disclosure

AT1	Additional Tier 1 capital
CAO	Capital Adequacy Ordinance
CaR	Capital at risk
CCB	Countercyclical buffer
CCF	Credit conversion factors
CCP	Central counterparty
CCR	Counterparty credit risk
CET1	Common Equity Tier 1 capital
CRM	Credit risk mitigation
CVA	Credit valuation adjustment
D-SIB	Domestic systemically important bank
EAD	Exposure at default
eCCB	Extended countercyclical capital buffer
EL	Expected loss
ΔEVE	Change in the economic value of equity
G-SIB	Global systemically important bank
HQLA	High-quality liquid assets
IRB	Internal ratings-based approach
IRRBB	Interest rate risk in the banking book
LCR	Liquidity coverage ratio
LGD	Loss given default
LRD	Leverage ratio denominator
ΔNII	Change in net interest income
PD	Probability of default
PONV	Point of non-viability
QCCP	Qualifying central counterparty
RWA	Risk-weighted assets
RWA density	RWA divided by total assets and off-balance-sheet exposures (post-CCF and post-CRM)
SA-BIS	International standardised approach for credit risk
SA-CCR	Standardised approach for measuring counterparty credit risk exposures
SFT	Securities financing transactions
Stressed VaR	Value at risk under a stress scenario
TCFD	Task Force on Climate Related Financial Disclosure
T2	Tier 2 capital
UNEP-FI	United Nations Environment Programme Finance Initiative
UN PRI	United Nations Principles for Responsible Investment
VaR	Value at risk
VA and P for EL	Value adjustments (VA) and provisions (P) for expected losses (EL)

About the figures

The amounts stated in this report have been rounded off. The total may therefore vary from the sum of the individual values.

The following rules apply to the tables:

0	(0 or 0.0) Figure that is smaller than half the unit of account used
–	No data available, not meaningful or not applicable

2 Introduction and material changes

Zürcher Kantonalbank is providing this information as at 31 December 2021 in accordance with its disclosure obligations. The relevant provisions form part of the Capital Adequacy Ordinance (CAO) and the disclosure requirements set out in FINMA Circular 2016/1 "Disclosure - banks" of 28 October 2015, last revised on 8 December 2021.

About the company

Zürcher Kantonalbank is an independent public-law institution of the Canton of Zurich. The endowment capital provided by the Canton of Zurich forms part of Zürcher Kantonalbank's own funds. The canton also provides a state guarantee for all the bank's non-subordinate liabilities should the bank's resources prove inadequate.

The group includes as parent company the largest cantonal bank in Switzerland and the fourth-largest Swiss bank. The broadly diversified consolidated group also includes Swisscanto Holding AG with its subsidiaries and their subsubsidiaries (Swisscanto Fund Management Company Ltd., Swisscanto Pensions Ltd., Swisscanto Private Equity CH I Ltd and Swisscanto Asset Management International SA), which are mainly engaged in asset management business. Zürcher Kantonalbank Finance (Guernsey) Ltd., which focuses on issuing structured investment products, ZKB Securities (UK) Ltd., which engages in equity brokerage and research, and Zürcher Kantonalbank Österreich AG, which operates in international private banking, are also part of the group. In addition, there is the representative office Zürcher Kantonalbank Representações Ltda., ZüriBahn AG and Philanthropy Services AG.

Calculation approaches for risk-based capital requirements

A selection of different approaches is available to banks for the calculation of risk-based capital requirements for credit, market and operational risks.

The capital requirement for credit risks is mainly calculated using the internal ratings-based approach (foundation IRB or F-IRB). For exposures where the IRB approach cannot be used, the capital requirement for credit risks is calculated using the international standardised approach (SA-BIS). The standardised approach for measuring counterparty credit risk exposures (SA-CCR) is used to determine the credit equivalent of derivatives. The capital requirement for the risk of credit value adjustments (CVA risk) due to the counterparty credit risk of derivatives is calculated in accordance with the standardised approach.

The capital requirement for market risk is calculated based on the internal market risk model approach (the value-at-risk model) approved by FINMA. Capital requirements are based on the market risks in the trading book and the exchange rate, precious metals and commodity risks in the banking book. Besides the daily value-at-risk (VaR) figures, daily stressed VaR figures are also included in the calculation of capital requirements. The total risk is also calculated using the model approach, although the value changes in risk factors are based on data that were observed in a period with significant market stress for Zürcher Kantonalbank. The capital requirement for the specific risks of interest rate instruments is calculated using the standardised approach.

Zürcher Kantonalbank uses the basic indicator approach to determine the capital requirement for operational risks.

Risk-based capital requirements for systemically important banks

The risk-based capital adequacy requirements for systemically important banks basically consist of capital adequacy requirements for the bank to continue its activities (going concern) and requirements for additional loss-absorbing capital (gone concern). In addition to these, since July 2012, there has been a countercyclical buffer requirement in Switzerland, which is activated, adjusted or suspended by the Federal Council at the request of the Swiss National Bank (SNB).

The risk-based total going concern requirement consists of a base requirement and additional requirements, calculated on the basis of market share and total exposure. Under Article 129, para. 2 CAO, the base requirement for

Zürcher Kantonalbank is 12.86 percent of risk-weighted assets (RWA). There are currently no additional requirements for Zürcher Kantonalbank as a result of market share or total exposure. The countercyclical buffer (CCB) under Art. 44 CAO was discontinued as at 27 March 2020. However, the CCB is being reactivated following the Federal Council decision of 26 January 2022, and banks will have to hold additional capital for residential mortgages in the amount of 2.5 percent starting 30 September 2022. In addition, the extended countercyclical buffer (eCCB) under Art. 44a CAO is being applied for the first time for Zürcher Kantonalbank as at 31 December 2021. The requirement as at 31 December 2021 from the eCCB is 0.01 percent of RWA. This results in a risk-based total requirement (going concern) of 12.87 percent as at 31 December 2021.

Under Article 132, para. 2 CAO, the risk-based gone concern requirement is measured based on the total going concern requirement (excluding the CCB) and varies for systemically important banks with and without international operations. For systemically important banks without international operations, such as Zürcher Kantonalbank, the requirements came into effect on 1 January 2019. Based on the transitional provisions in Article 148j CAO, the gross gone concern requirement in 2021 is 1.92 percent of RWA. This will increase in stages until 2026, when the gross gone concern requirement will be equal to 40 percent of the total going concern requirement for Zürcher Kantonalbank (excluding the CCB). In a letter dated 3 September 2019, FINMA set the risk-based gone concern requirement for contingency planning at Zürcher Kantonalbank at 7.86 percent gross from 2026, including the total stipulated in the CAO based on size and market share (mirroring the going concern requirement). Under the transitional provisions in Art. 148j CAO, this is equivalent to an additional risk-based requirement of 1.01 percent gross as at 31 December 2021. This results in a total risk-based gone concern requirement of 2.93 percent gross as at 31 December 2021. The total risk-based gone concern requirement is being increased gradually to 7.86 percent by 2026, as already mentioned.

Calculation approaches for unweighted capital adequacy requirements (leverage ratio)

When calculating the derivative exposure for the purposes of unweighted capital adequacy requirements (leverage ratio), margin no. 51.1 of FINMA Circular 2015/3 "Leverage Ratio - Banks" allows banks the option of using the standardised approach (SA-CCR). Zürcher Kantonalbank has used this since 31 December 2018 both as required for risk-based capital adequacy requirements and voluntarily for the leverage ratio.

Unweighted capital adequacy requirements (leverage ratio) for systemically important banks

The unweighted capital adequacy requirements for systemically important banks also consist of capital adequacy requirements for the bank to continue its activities (going concern) and additional loss-absorbing capital (gone concern). Any countercyclical buffer (CCB) and extended countercyclical capital buffer (eCCB) requirement is not applicable to the leverage ratio.

The unweighted total going concern requirement consists of a base requirement and additional requirements, calculated on the basis of market share and total exposure. Under Article 129, para. 2 CAO, the base requirement for Zürcher Kantonalbank is 4.5 percent of total exposure. There are currently no additional requirements for Zürcher Kantonalbank as a result of market share or total exposure. The result as at 31 December 2021 for both the group and parent company is a total going concern requirement of 4.5 percent.

Under Article 132, para. 2 CAO, the unweighted gone concern requirement is measured based on the total going concern requirement and varies for systemically important banks with and without international operations. For systemically important banks without international operations, such as Zürcher Kantonalbank, the requirements came into effect on 1 January 2019. Based on the transitional provisions in Article 148j CAO, the gross gone concern requirement in 2021 is 0.63 percent of total exposure. This will increase in stages until 2026, when the gross gone concern requirement will be equal to 40 percent of the total going concern requirement for Zürcher Kantonalbank. In a letter dated 3 September 2019, FINMA increased the unweighted gone concern requirement for contingency planning at Zürcher Kantonalbank from 2026 in the same ratio as for the risk-based gone concern requirements. Under the transitional provisions in Art. 148j CAO, this is equivalent to an additional unweighted requirement of 0.33 percent gross as at 31 December 2021. This results in a total unweighted gone concern requirement of 0.96

percent gross as at 31 December 2021. The total unweighted gone concern requirement is being increased gradually to 2.75 percent gross by 2026.

Material changes in the selection of approaches to calculating the capital ratios

There were no material changes in the selection of approaches to calculating the capital ratios in the quarter under review.

Changes in group regulatory capital and liquidity in comparison with the previous quarter

As at 31 December 2021, the capital base of Zürcher Kantonalbank comfortably exceeded the regulatory requirements on both a risk-based and unweighted basis. The liquidity situation of Zürcher Kantonalbank also remains comfortable.

For explanations of the main reasons that led to the changes compared with the previous quarter, we refer to our comments on table KM1 on page 10.

Group risk-weighted assets (RWA) as at 31 December 2021 amounted to CHF 71,553 million (30 September 2021: CHF 71,140 million). They were therefore CHF 413 million higher than in the previous quarter.

Risk-based capital adequacy requirements on a going concern basis as a systemically important bank stood at CHF 9,207 million on 31 December 2021 (30 September 2021: CHF 9,149 million), compared to eligible capital on a going concern basis in the group of CHF 13,253 million (30 September 2021: CHF 12,734 million). This is equivalent to surplus cover of CHF 4,046 million (30 September 2021: CHF 3,585 million). The surplus cover therefore increased by CHF 461 million in the fourth quarter of 2021.

The core capital ratio (going concern) on a group basis as at 31 December 2021 was 18.5 percent (30 September 2021: 17.9 percent). It was thus 5.6 percentage points (30 September 2021: 5.0 percentage points) above the 12.9 percent going concern requirement (30 September 2021: 12.9 percent).

At CHF 2,860 million (4.0 percent of RWA), the eligible additional loss-absorbing capital exceeded the gone concern requirement by CHF 761 million as at 31 December 2021 (as at 30 September 2021 the surplus cover was CHF 776 million).

The total leverage ratio exposure increased by CHF 784 million from 30 September 2021 to CHF 212,425 million.

The unweighted total going concern requirement remains unchanged at 4.5 percent. Eligible capital on a going concern basis for the leverage ratio is the same as for the risk-based requirements. This results in surplus cover in the leverage ratio on a going concern basis of 1.7 percentage points as at 31 December 2021 (30 September 2021: 1.5 percentage points), equivalent to CHF 3,694 million (30 September 2021: CHF 3,210 million).

Eligible capital on a gone concern basis for the leverage ratio is also the same as for the risk-based requirements. At CHF 2,860 million (1.3 percent of total exposure), the eligible additional loss-absorbing capital exceeds the gone concern requirement of CHF 2,045 million as at 31 December 2021.

With the current composition of eligible capital and eligible additional loss-absorbing capital, Zürcher Kantonalbank would meet the final rules from 2026 as follows: There is surplus cover of CHF 3,305 million above the risk-based going concern requirement and CHF 218 million above the risk-based gone concern requirement. On an unweighted basis, the surplus cover amounts to CHF 2,953 million above the going concern requirement and the gone concern requirement would be met exactly.

As a systemically important bank, Zürcher Kantonalbank is subject to stricter liquidity requirements: it has to meet a higher liquidity coverage ratio (LCR) than non-systemically important banks. Zürcher Kantonalbank's ongoing comfortable liquidity situation is reflected in the LCR. On a group basis, the LCR increased from the previous quarter and stood at an average of 160 percent in the fourth quarter of 2021 (third quarter of 2021: 158 percent).

The new provisions of the Liquidity Ordinance on the net stable funding ratio (NSFR) were introduced as at 1 July 2021; these state that the NSFR of Zürcher Kantonalbank must be at least 100 percent. On a group basis, the NSFR amounts to 118 percent as at 31 December 2021 (30 September 2021: 120 percent), which means this liquidity requirement is met comfortably.

3 Publication frequency of the details on capital and liquidity

The following table gives an overview of the publication frequency of capital and liquidity details which have to be disclosed under current regulations (FINMA Circular 2016/1 "Disclosure - banks"). Tables marked n/a are not applicable for Zürcher Kantonalbank and so are not produced. All other tables are published at the prescribed frequency for domestic systemically important banks reporting financial information semi-annually.

		QUAL or QC [1]	Disclosure frequency		
Reference	**Table name**		**Quarterly**	**Semiannual**	**Annual**
KM1	Key metrics	QC	■		
KM2	Key metrics - TLAC requirements (at resolution group level)	QC	n/a	n/a	n/a
OVA	Bank risk management approach	QUAL			■
OV1	Overview of RWA	QC		■	
LI1	Differences between accounting and regulatory scopes of consolidation and mapping of financial statement categories with regulatory risk categories	QC			■
LI2	Main sources of differences between regulatory exposure amounts and carrying values in consolidated financial statements	QC			■
LIA	Explanations of differences between accounting and regulatory exposure amounts	QUAL			■
PV1	Prudent valuation adjustments (PVA)	QC			■
CC1	Composition of regulatory capital	QC		■	
CC2	Reconciliation of regulatory capital to balance sheet	QC		■	
CCA	Main features of regulatory capital instruments and of other TLAC-eligible instruments	QUAL / QC		■	
TLAC1	TLAC composition for G-SIBs (at resolution group level)	QC	n/a	n/a	n/a
TLAC2	Material subgroup entity - creditor ranking at legal entity level	QC	n/a	n/a	n/a
TLAC3	Resolution entity - creditor ranking at legal entity level	QC	n/a	n/a	n/a
GSIB1	Disclosure of G-SIB indicators	QC	n/a	n/a	n/a
CCyB1	Geographical distribution of credit exposures used in the countercyclical buffer	QC		■	
LR1	Leverage ratio: summary comparison of accounting assets vs leverage ratio exposure measure	QC		■	
LR2	Leverage ratio: leverage ratio common disclosure template	QC		■	
LIQA	Liquidity: liquidity risk management	QUAL / QC			■
LIQ1	Liquidity: Liquidity coverage ratio (LCR)	QC		■	
LIQ2	Liquidity: Net stable funding ratio (NSFR)	QC		■	
CRA	Credit risk: general qualitative information about credit risk	QUAL			■
CR1	Credit risk: credit quality of assets	QC		■	
CR2	Credit risk: changes in stock of defaulted loans and debt securities	QC		■	
CRB	Credit risk: additional disclosure related to the credit quality of assets	QUAL / QC			■
CRC	Credit risk: qualitative disclosure requirements related to credit risk mitigation techniques	QUAL			■
CR3	Credit risk: credit risk mitigation techniques - overview	QC		■	
CRD	Credit risk: qualitative disclosures on banks' use of external credit ratings under the standardised approach for credit risk	QUAL			■
CR4	Credit risk: standardised approach - credit risk exposure and credit risk mitigation (CRM) effects	QC		■	
CR5	Credit risk: standardised approach - exposures by asset classes and risk weights	QC		■	
CRE	IRB: qualitative disclosures related to IRB models	QUAL			■
CR6	IRB: credit risk exposures by portfolio and probability of default (PD) range	QC		■	
CR7	IRB: effect on RWA of credit derivatives used as CRM techniques	QC		■	
CR8	IRB: RWA flow statements of credit risk exposures under IRB	QC		■	
CR9	IRB: back-testing of PD per portfolio	QC			■
CR10	IRB: specialised lending and equities under the simple risk weight method	QC		■	

[1] Qualitative (QUAL) or quantitative with comments (QC)

Reference	Table name	QUAL or QC [1]	Disclosure frequency		
			Quarterly	Semiannual	Annual
CCRA	Counterparty credit risk: qualitative disclosure related to counterparty credit risk	QUAL			■
CCR1	Counterparty credit risk: analysis of counterparty credit risk (CCR) exposure by approach	QC		■	
CCR2	Counterparty credit risk: credit valuation adjustment (CVA) capital charge	QC		■	
CCR3	Counterparty credit risk: standardised approach of CCR exposures by regulatory portfolio and risk weights	QC		■	
CCR4	IRB: CCR exposures by portfolio and PD scale	QC		■	
CCR5	Counterparty credit risk: composition of collateral for CCR exposure	QC		■	
CCR6	Counterparty credit risk: credit derivatives exposures	QC		■	
CCR7	Counterparty credit risk: RWA flow statements of CCR exposures under the Internal Model Method (IMM)	QC		■	
CCR8	Counterparty credit risk: exposures to central counterparties	QC		■	
SECA	Securitisations: qualitative disclosure requirements related to securitisation exposures	QUAL			■
SEC1	Securitisations: exposures in the banking book	QC		■	
SEC2	Securitisations: exposures in the trading book	QC		■	
SEC3	Securitisations: exposures in the banking book and associated regulatory capital requirements – bank acting as originator or as sponsor	QC		■	
SEC4	Securitisations: exposures in the banking book and associated capital requirements – bank acting as investor	QC		■	
MRA	Market risk: general qualitative disclosure requirements related to market risk	QUAL			■
MR1	Market risk: market risk under SA	QC		■	
MRB	Market risk: qualitative disclosures for banks using the Internal Model Approach (IMA)	QUAL			■
MR2	Market risk: RWA flow statements of market risk exposures under IMA	QC		■	
MR3	Market risk: IMA values for trading portfolios	QC		■	
MR4	Market risk: comparison of VaR estimates with gains/losses	QC		■	
IRRBBA	Interest rate risk: interest rate risk in the banking book (IRRBB) risk management objective and policies	QUAL / QC			■
IRRBBA1	Interest rate risk: quantitative information on exposure structure and repricing	QC			■
IRRBB1	Interest rate risk: quantitative information on IRRBB	QC			■
REMA	Remuneration: policy	QUAL	n/a	n/a	n/a
REMA1	Remuneration: remuneration awarded during the financial year	QC	n/a	n/a	n/a
REMA2	Remuneration: special payments	QC	n/a	n/a	n/a
REMA3	Remuneration: deferred remuneration	QC	n/a	n/a	n/a
ORA	Qualitative disclosure requirements related to operational risks	QUAL			■
Annex 3	Disclosure requirements for systemically important banks: risk-based capital requirements based on capital ratios	QC	■		
Annex 3	Disclosure requirements for systemically important banks: unweighted capital requirements based on the leverage ratio	QC	■		

[1] Qualitative (QUAL) or quantitative with comments (QC)

4 Overview total risk

4.1 KM1: Key metrics (group)

Group		a	b	c	d	e
in million CHF (unless stated otherwise)		31.12.2021	30.09.2021	30.06.2021	31.03.2021	31.12.2020
	Eligible capital					
1	Common equity Tier 1 (CET1)	**12,188**	11,669	11,661	11,652	11,903
1a	Fully loaded ECL (expected credit loss) accounting model CET1 [1]	**–**	–	–	–	–
2	Tier 1 capital (T1)	**13,253**	12,734	12,722	12,709	12,968
2a	Fully loaded ECL (expected credit loss) accounting model T1 [1]	**–**	–	–	–	–
3	Total capital	**14,063**	13,554	13,547	13,529	13,508
3a	Fully loaded ECL (expected credit loss) accounting model total capital [1]	**–**	–	–	–	–
	Risk-weighted assets (RWA)					
4	RWA	**71,553**	71,140	71,166	71,526	68,515
	Minimum required capital					
4a	Minimum required capital	**5,724**	5,691	5,693	5,722	5,481
	Risk-based capital ratios (in % of RWA) [2]					
5	CET1 ratio	**17.0%**	16.4%	16.4%	16.3%	17.4%
5a	Fully loaded ECL (expected credit loss) accounting model CET1 ratio [1]	**–**	–	–	–	–
6	Tier 1 capital ratio	**18.5%**	17.9%	17.9%	17.8%	18.9%
6a	Fully loaded ECL (expected credit loss) accounting model Tier 1 ratio [1]	**–**	–	–	–	–
7	Total capital ratio	**19.7%**	19.1%	19.0%	18.9%	19.7%
7a	Fully loaded ECL (expected credit loss) accounting model total capital ratio [1]	**–**	–	–	–	–
	CET1 buffer requirements (in % of RWA)					
8	Capital conservation buffer as per the Basel minimum standards (2.5% from 2019)	**2.5%**	2.5%	2.5%	2.5%	2.5%
9	Countercyclical buffer (Art. 44a CAO) in accordance with the Basel minimum standards	**0.0%**	–	–	–	–
10	Additional capital buffer due to international or national system relevance	**–**	–	–	–	–
11	Total of bank CET1 specific buffer requirements	**2.5%**	2.5%	2.5%	2.5%	2.5%
12	CET1 available after meeting the bank's minimum capital requirements	**11.7%**	11.1%	11.0%	10.9%	11.7%
	Capital target ratios as per Annex 8 to the CAO (in % of RWA) [3]					
12a	Capital conservation buffer in accordance with Annex 8 to the CAO	**–**	–	–	–	–
12b	Countercyclical buffers (Art. 44 and Art. 44a CAO)	**–**	–	–	–	–
	Countercyclical buffer (Art. 44 CAO)	**–**	–	–	–	–
12c	CET1 target ratio in accordance with Annex 8 to the CAO plus the countercyclical buffers in accordance with Art. 44 and 44a CAO	**–**	–	–	–	–
12d	T1 target ratio in accordance with Annex 8 to the CAO plus countercyclical buffers in accordance with Art. 44 and 44a CAO	**–**	–	–	–	–
12e	Total capital target ratio in accordance with Annex 8 to the CAO plus countercyclical buffers in accordance with Art. 44 and 44a CAO	**–**	–	–	–	–
	Basel III leverage ratio					
13	Total Basel III leverage ratio exposure measure	**212,425**	211,641	211,135	216,387	208,326
14	Basel III leverage ratio (Tier 1 capital in % of leverage ratio exposure measure)	**6.2%**	6.0%	6.0%	5.9%	6.2%
14a	Basel III leverage ratio under the fully loaded ECL (expected credit loss) accounting model (Tier 1 capital in % of leverage ratio exposure measure) [1]	**–**	–	–	–	–
	Liquidity coverage ratio (LCR) [4]					
15	LCR numerator: total high-quality liquid assets (HQLA)	**51,682**	50,503	60,206	60,010	53,042
16	LCR denominator: total net outflows of funds	**32,242**	31,908	41,006	39,581	33,190
17	Liquidity coverage ratio (LCR)	**160%**	158%	147%	152%	160%
	Net stable funding ratio (NSFR) [5]					
18	Available stable refinancing	**108,217**	108,552	–	–	–
19	Required stable refinancing	**91,486**	90,186	–	–	–
20	Net stable funding ratio, (NSFR)	**118%**	120%	–	–	–

[1] Zürcher Kantonalbank adopted the rules on value adjustments and provisions for expected losses on 01.01.2021. The initial allocation to value adjustments and provisions for expected losses was made as a lump sum, rather than being built up on a linear basis. Zürcher Kantonalbank is not making use of the transitional rules, which is why these rows are not applicable.

[2] The figures are calculated in accordance with the provisions of the CAO for non-systemically important banks.

[3] Systemically important banks can forego the information in rows 12a to 12e, as Annex 8 to the CAO does not apply to them. In this instance, they must nevertheless provide information on the countercyclical buffer in accordance with Art. 44 CAO.

[4] Simple average of the closing values on the business days during the quarter under review.

[5] Rows 18 – 20 must be disclosed when the provisions of the Liquidity Ordinance on the net stable funding ratio (NSFR) enter into force on 01.07.2021.

Common Equity Tier 1 (CET1), Tier 1 capital (T1) and Total capital as at 31 December 2021 increased mainly due to the planned retained profit of CHF 512 million.

Total RWA rose by a modest CHF 413 million to CHF 71,553 million from 30 September 2021. The combination of the increased capital and barely changed RWA as at 31 December 2021 resulted in an increase of 0.6 percentage points in all three risk-based capital ratios compared to the end of the previous quarter.

The extended countercyclical buffer (eCCB) under Art. 44a CAO applies to Zürcher Kantonalbank for the first time as at 31 December 2021. The requirement as at 31 December 2021 from the eCCB is 0.01 percent of RWA. Hence the eCCB has no material impact on the CET1 buffer requirements under the Basel minimum standards. The available CET1 ratio after meeting the Basel minimum standard therefore rose by 0.6 percent.

Total leverage ratio exposure also rose only modestly in the past quarter, up CHF 784 million to CHF 212,425 million. In combination with the increase in Tier 1 capital, this resulted in a leverage ratio 0.2 percentage points higher at 6.2 percent as at 31 December 2021 (30 September 2021: 6.0 percent).

The LCR on a group basis increased compared with the previous quarter and averaged 160 percent in the fourth quarter of 2021 (third quarter of 2021: 158 percent). As a systemically important bank, Zürcher Kantonalbank is subject to stricter liquidity requirements; it satisfies these comfortably.

The new requirements regarding the structural financing ratio (NSFR) came into force in mid-2021. Zürcher Kantonalbank has met these requirements with a comfortable buffer for some time. The NSFR on a group basis decreased slightly compared with the end of the previous quarter, amounting to 118 percent as at 31 December 2021.

4.2 KM1: Key metrics (parent company)

The group's regulatory ratios are largely driven by the figures at the parent company. Hence the comments and explanations for the parent company are essentially identical to those for the group (see above) and will not be repeated for the following table.

Parent company		a	b	c	d	e
in million CHF (unless stated otherwise)		31.12.2021	30.09.2021	30.06.2021	31.03.2021	31.12.2020
	Eligible capital					
1	Common equity Tier 1 (CET1)	**12,380**	11,869	11,868	11,867	12,130
1a	Fully loaded ECL (expected credit loss) accounting model CET1 [1]	–	–	–	–	–
2	Tier 1 capital (T1)	**13,445**	12,934	12,929	12,924	13,195
2a	Fully loaded ECL (expected credit loss) accounting model T1 [1]	–	–	–	–	–
3	Total capital	**14,253**	13,751	13,752	13,742	13,735
3a	Fully loaded ECL (expected credit loss) accounting model total capital [1]	–	–	–	–	–
	Risk-weighted assets (RWA)					
4	RWA	**72,280**	71,875	71,938	72,264	69,304
	Minimum required capital					
4a	Minimum required capital	**5,782**	5,750	5,755	5,781	5,544
	Risk-based capital ratios (in % of RWA) [2]					
5	CET1 ratio	**17.1%**	16.5%	16.5%	16.4%	17.5%
5a	Fully loaded ECL (expected credit loss) accounting model CET1 ratio [1]	–	–	–	–	–
6	Tier 1 capital ratio	**18.6%**	18.0%	18.0%	17.9%	19.0%
6a	Fully loaded ECL (expected credit loss) accounting model Tier 1 ratio [1]	–	–	–	–	–
7	Total capital ratio	**19.7%**	19.1%	19.1%	19.0%	19.8%
7a	Fully loaded ECL (expected credit loss) accounting model total capital ratio [1]	–	–	–	–	–
	CET1 buffer requirements (in % of RWA)					
8	Capital conservation buffer as per the Basel minimum standards (2.5% from 2019)	**2.5%**	2.5%	2.5%	2.5%	2.5%
9	Countercyclical buffer (Art. 44a CAO) in accordance with the Basel minimum standards	**0.0%**	–	–	–	–
10	Additional capital buffer due to international or national system relevance	–	–	–	–	–
11	Total of bank CET1 specific buffer requirements	**2.5%**	2.5%	2.5%	2.5%	2.5%
12	CET1 available after meeting the bank's minimum capital requirements	**11.7%**	11.1%	11.1%	11.0%	11.8%
	Capital target ratios as per Annex 8 to the CAO (in % of RWA) [3]					
12a	Capital conservation buffer in accordance with Annex 8 to the CAO	–	–	–	–	–
12b	Countercyclical buffers (Art. 44 and Art. 44a CAO)	–	–	–	–	–
	Countercyclical buffer (Art. 44 CAO)	–	–	–	–	–
12c	CET1 target ratio in accordance with Annex 8 to the CAO plus the countercyclical buffers in accordance with Art. 44 and 44a CAO	–	–	–	–	–
12d	T1 target ratio in accordance with Annex 8 to the CAO plus countercyclical buffers in accordance with Art. 44 and 44a CAO	–	–	–	–	–
12e	Total capital target ratio in accordance with Annex 8 to the CAO plus countercyclical buffers in accordance with Art. 44 and 44a CAO	–	–	–	–	–
	Basel III leverage ratio					
13	Total Basel III leverage ratio exposure measure	**212,654**	211,880	211,368	216,607	208,596
14	Basel III leverage ratio (Tier 1 capital in % of leverage ratio exposure measure)	**6.3%**	6.1%	6.1%	6.0%	6.3%
14a	Basel III leverage ratio under the fully loaded ECL (expected credit loss) accounting model (Tier 1 capital in % of leverage ratio exposure measure) [1]	–	–	–	–	–
	Liquidity coverage ratio (LCR) [4]					
15	LCR numerator: total high-quality liquid assets (HQLA)	**51,671**	50,493	60,198	60,002	53,028
16	LCR denominator: total net outflows of funds	**32,385**	32,057	41,228	39,788	33,379
17	Liquidity coverage ratio (LCR)	**160%**	158%	146%	151%	159%
	Net stable funding ratio (NSFR) [5]					
18	Available stable refinancing	**107,726**	108,054	–	–	–
19	Required stable refinancing	**91,520**	91,190	–	–	–
20	Net stable funding ratio, (NSFR)	**118%**	118%	–	–	–

[1] Zürcher Kantonalbank adopted the rules on value adjustments and provisions for expected losses on 01.01.2021. The initial allocation to value adjustments and provisions for expected losses was made as a lump sum, rather than being built up on a linear basis. Zürcher Kantonalbank is not making use of the transitional rules, which is why these rows are not applicable.

[2] The figures are calculated in accordance with the provisions of the CAO for non-systemically important banks.

[3] Systemically important banks can forego the information in rows 12a to 12e, as Annex 8 to the CAO does not apply to them. In this instance, they must nevertheless provide information on the countercyclical buffer in accordance with Art. 44 CAO.

[4] Simple average of the closing values on the business days during the quarter under review.

[5] Rows 18 – 20 must be disclosed when the provisions of the Liquidity Ordinance on the net stable funding ratio (NSFR) enter into force on 01.07.2021.

4.3 OVA: Bank risk management approach

Ongoing operations at a universal bank such as Zürcher Kantonalbank require comprehensive and systematic risk management, with monitoring and controlling units acting independently of the risk managers.

Principles of risk management

The objective of risk management is to support the bank in generating added value while maintaining a first-class credit rating and reputation. Zürcher Kantonalbank's approach to risk management is based on the following principles:

- Risk culture: The bank fosters a risk culture that is geared towards responsible behaviour. Risk managers bear responsibility for profits and losses generated from the risks entered into. In addition, they have primary responsibility for identifying transactions and structures that entail particular business policy risks, conflicts of interest or particular effects on the bank's reputation.
- Separation of functions: For significant risks and to avoid conflicts of interest, the bank has established control processes that are independent of management.
- Risk identification and monitoring: The bank enters into transactions only if the risks are in accordance with its business strategy and can be appropriately identified, restricted, managed and monitored.
- Risk and return: The bank seeks to achieve a balanced relationship between risk and return for all transactions. Assessment of the risk / return profile takes account of quantifiable as well as non-quantifiable risks.
- Transparency: Risk reporting and disclosure are guided by high industry standards in terms of objectivity, scope, transparency and timeliness.

These principles constitute the basis for determining the organisational structure and processes of group-wide risk management.

Risk management and internal control system (ICS)

Zürcher Kantonalbank defines "risk management" and "internal control system (ICS)" as follows:

Risk management: As part of risk management, the bank sets its risk tolerance within its risk capacity. Risk management encompasses organisational structures, methods and processes. Zürcher Kantonalbank's risk management process consists of six steps: risk identification, assessment, control, management, monitoring and reporting. The decisions in risk management are implemented in the internal control system (ICS).

Internal control system (ICS): The ICS ensures that processes are carried out properly. To this end, management issues appropriate guidelines and ensures that compliance is monitored. An effective ICS includes control activities that are integrated into workflows, suitable risk management and compliance processes, and appropriate supervisory bodies for the size, complexity and risk profile of the institution, in particular an independent risk control and compliance function.

Identifying and reducing the inherent risks involved in the business model are also an important aspect of the internal control system. For more information on the underlying processes, please see table CRA (Credit risk, page 45), table CCRA (Counterparty credit risk, page 66), table MRA (Market risk, page 73) and table ORA (Operational risks, page 83).

For reporting on the effectiveness of the ICS, please see section "Internal risk reporting" on page 22.

Risk management process

Zürcher Kantonalbank divides the risk management process into the following stages:

Identification	The risks relevant to the group are identified on an ongoing basis, either through regular, systematic observation of the corporate environment and risk profile, or as the potential result of one of the following steps.
Assessment	Assessment of an identified risk includes qualitative assessment and quantification (measurement / valuation). In order to counter the limits to quantification of different types of risk, models or expert assessments are used depending on the type of risk to calculate the potential size of the loss, the probability of occurrence and the correlation with other risks.
Steering	Risk steering is assured via risk tolerance requirements. Risk tolerance includes both quantitative and qualitative considerations concerning the main risks the group is willing to accept to achieve its strategic business objectives given its capital and liquidity planning. Qualitative risk requirements are primarily issued in the form of regulations, directives or instructions, but also cover risk policy and aspects of strategy. Quantitative requirements are issued in the form of limits and benchmarks. At group level, these are chiefly the risk policy rules from the Board of Directors and the rules to limit risk set by the Risk Committee of the Executive Board.
Management	Units managing risk perform their tasks within the risk tolerance set by the officer responsible. As part of the ICS, this includes taking countermeasures to avoid or limit risks or loss.
Monitoring	Risk monitoring takes the form of limit monitoring and ongoing monitoring of risk exposures by units independent of the risk manager. The risk organisation and the Compliance function are examples of such units.
Reporting	Risk reporting supports all levels of the hierarchy and stakeholders in assessing and monitoring risks.

Principles of compliance

The objective of compliance is to ensure that Zürcher Kantonalbank conducts its business operations in accordance with legal and ethical norms. The principles of the compliance policy are as follows:

- relevant legal and ethical norms;
- ethical and performance-related basic values in a code of conduct;
- duty of all employees and members of governing bodies to comply with laws, regulations, internal rules, industry standards;
- special reporting procedure available for identified violations of the rules (whistleblowing).

Primary responsibility for compliance lies with the Executive Board. The Compliance function prepares an annual assessment of compliance risk and a corresponding action plan based on a risk inventory. The Compliance function is organisationally independent of the income-driven business units. The most important principle of all is that Zürcher Kantonalbank conducts its banking operations in accordance with the statutory and regulatory provisions as well as recognised professional and ethical principles within the banking industry.

Risk organisation

Risk organisation at Zürcher Kantonalbank is arranged so that the profit-oriented functions of taking and managing risk are always structurally separate at Executive Board level from the preventive risk management and risk control functions.

1 General Counsel has the right of escalation to the Committee of the Board at any time.

Board of Directors

The Board of Directors approves the principles for risk management and compliance, the Code of Conduct, the framework for group-wide risk management and the risk tolerance regulations at group level. It is responsible for

the regulation, organisation and monitoring of an effective risk management system as well as the management of overall risks. The Board of Directors is responsible for ensuring that there is a suitable risk and control environment within the group and arranges for an effective internal control system (ICS). It also approves transactions involving major financial exposure. The Risk Committee and Audit Committee of the Board of Directors support the Board in its tasks and duties in the areas of risk management and the internal control system.

Committee of the Board

The Committee of the Board approves limits and deals with transactions involving particular business policy risks, conflicts of interest or particular effects on the group's reputation where these exceed the remit of the Executive Board and do not fall within the remit of the Board of Directors.

Audit

Audit supports the Board of Directors in fulfilling its statutory supervisory and control tasks and discharges the monitoring tasks assigned to it by the Board of Directors. In particular, Audit independently and objectively evaluates the appropriateness and effectiveness of the internal control and risk management processes and contributes towards their improvement. Audit also checks the bank's compliance with regulatory provisions, internal directives and guidelines. Audit has unlimited rights of inspection, information and access within the entire group. Audit provides line managers with support in the form of consulting services that help to increase the efficiency of organisational structures and processes.

Executive Board

The Executive Board issues provisions for the identification, evaluation, control, management, monitoring and reporting of risks in the form of directives. The Executive Board also approves transactions that entail particular business policy risks, conflicts of interest or particular effects on the reputation of Zürcher Kantonalbank, unless they are assigned to another governing body under the applicable regulations.

Risk unit

The Chief Risk Officer (CRO) is a member of the Executive Board and heads the Risk unit. He has a right of intervention that permits measures to be assigned to the risk managers if required by the risk situation or to protect the bank. The CRO also enjoys direct access to the Committee of the Board at all times. The business unit consists of the Credit Risk, Market Risk, Operational Risk and Risk Control organisational units.

The risk control function, which monitors portfolio-level risks and the Board of Directors' risk tolerance requirements, reports to the Executive Board and the Board of Directors. The risk control function is responsible for defining methods of risk measurement, model validation, as well as execution and quality assurance in relation to the risk measurement implemented.

Preventative risk management examines transactions before they are finalised and systems prior to their deployment in line with existing delineations of power and consultation duties, and defines the requirements at individual transaction or system level. It also continuously monitors local risks and supports the training of risk managers.

Preventive risk management in the area of operational risk security is carried out outside the Risk business unit by the respective process managers and in the Security department of the IT, Operations & Real Estate business unit.

Compliance line / Compliance function

The General Counsel reports directly to the CEO and manages the Compliance unit. As a member of the Risk, Conflicts and International Committees of the Executive Board, he has a right of escalation to the Committee of the Board. He also enjoys direct access to the Committee of the Board at all times.

The Compliance function has the following duties, among others: examining the compliance risk inventory on an annual basis and preparing the action plan with focal points relating to the management of compliance risks, formulating proposals and carrying out defined monitoring and control duties (e. g. as pre-deal or post-deal control), as well as defining risk management tools. The function also defines risk management measures for compliance risk independently of the individual case, such as the editing of directives when implementing new ordinances as well as conducting training courses. The Compliance function is further responsible for providing forward-looking legal advice with the objective of avoiding or minimising individual identified risks and threats arising from legal requirements. Legal advice is provided in the context of existing mandatory consultations, as a pre-deal consultation or on request.

Risk managers

The risk managers bear responsibility for profits and losses generated on the risks entered into. They are responsible for the continuous, active management of risks and for compliance with internal risk tolerance regulations, relevant laws, ordinances, circulars and standards. The sales units are responsible for credit risks as risk managers and the Trading and Capital Markets organisational unit for market risks in the trading book. Interest rate risks in the banking book and liquidity risks are the responsibility of Treasury in the Finance unit. All units of the bank are responsible for managing operational and compliance risks.

Risk Committee of the Board of Directors

The Risk Committee of the Board of Directors focuses on credit, market and liquidity risks, operational and compliance risks, and reputation risks. It performs the tasks set out in FINMA Circular 2017/1 "Corporate governance - banks". These are, in summary:

- To discuss and review the overall concept in place annually;
- To give preliminary consideration to the risk policy rules;
- To acknowledge and discuss risk reporting;
- To monitor implementation of the risk strategies to ensure they are compatible with the risk tolerance and risk limits set;
- To review the capital and liquidity planning;
- To assess measures taken as a result of audit recommendations;
- To assess the bank's compensation system for risk-related issues.

The Risk Committee of the Board of Directors also provides preliminary advice on major transactions that fall within the remit of the Board of Directors. The committee is also kept informed of transactions that fall within the remit of the Committee of the Board. The duties, competences and responsibility of the committee are set out in the Guidelines on the Duties and Powers of the Risk Committee of Zürcher Kantonalbank.

Audit Committee of the Board of Directors

The Audit Committee is an audit committee as defined in FINMA Circular 2017/1 "Corporate governance - banks" and supports the Board of Directors at group and parent company level in monitoring internal and external audit, the internal control system and the audit of the annual financial statements. The duties and powers of the Audit Committee of the Board of Directors include:

- analysing and discussing the financial planning;
- assessing the proper functioning of the ICS and informing the Board of Directors about this;
- receiving and discussing the activity reports of the Compliance function and Risk Control.

The duties, competences and responsibilities of the committee are set out in the Guidelines on the Duties and Powers of the Audit Committee of Zürcher Kantonalbank.

Risk Committee of the Executive Board and committees

The Risk Committee assists the Executive Board in defining risk management processes. The Committee is chaired by the CRO and approves the methods of risk measurement on the basis of the responsibilities delegated to it. The

risk managers on the four separate subcommittees (credit, trading, treasury and operational risk) and members of the risk and compliance organisation discuss the Risk Committee's business and formulate proposals for its attention.

Conflicts Committee

Based on the responsibilities delegated to them, the members of the Executive Board who sit on the Conflicts Committee take decisions regarding transactions that entail particular business policy risks, conflicts of interest and particular effects on the group's reputation. The Conflicts Committee is chaired by the CEO; its escalation body is the Committee of the Board.

International Committee

The International Committee is chaired by the CRO. It defines the specific business policy requirements for transactions with an international dimension, monitors and reports on such transactions, and approves the permissible business activities per country.

Crisis organisation

In the event of a crisis, in addition to the above committees, a Risk Crisis Team is set up, supported by divisional crisis teams. It has the task of ensuring that decisions are taken in an efficient and coordinated manner in the event of a crisis. The crisis team provides support to the Executive Board during crises affecting the group, such as systemic and financial market crises, which the emergency organisation cannot cover. The divisional crisis teams (banks, liquidity) cross reporting lines, with the aim of working with all units affected to identify and implement necessary and appropriate measures in their area of responsibility.

Business continuity management (BCM)

The emergency organisation supports the bank in dealing with major disruptions and crises caused by operational risks that cannot be resolved by the normal line organisation. Such disruptions include, for example, a total IT/data failure, the loss of a critical number of employees, central locations or critical suppliers/partners. It is important to distinguish crisis management from the associated advance planning measures (which are part of business continuity management).

The emergency response organisation consists of two tiers. The first tier is the divisional emergency response organisations, comprising the Real Estate emergency organisation and the IT emergency organisation. The divisional emergency response organisations support the Zürcher Kantonalbank emergency response organisation as a second tier in crisis management. The emergency response organisation is chaired by the Head of the business unit IT, Operations & Real Estate. Other members include the representatives of the other business units, Corporate Communications and the emergency organisation staff. In the event of a pandemic, the Pandemic Task Force can be deployed as a partial contingent of the emergency organisation to support the operational organisation.

In the event of a crisis affecting the entire Swiss financial sector, the Swiss National Bank's Interbank Alarm and Crisis Organisation (IAKO) ensures that measures are coordinated among the various institutions.

Risk categories

Zürcher Kantonalbank divides risks into the following categories:

Credit risk

Definition	Credit risk constitutes the risk of financial losses that can arise if clients or counterparties do not fulfil contractual obligations that are falling due or do not fulfil them on time. Loans, promises of payment and trading transactions all involve credit risks.

Sub-categories	Counterparty risks refer to credit risks in trading transactions (e. g. OTC derivatives and SLB transactions). Trading transactions usually include mutual claims, which also depend on market parameters. Counterparty risks are also referred to as counterparty default risks. Settlement risks describe the risk of losses in connection with transactions involving mutual payment and delivery obligations, where the bank must meet its delivery obligation without first being able to ensure that counter-payment will be made. Country risks: The risk of losses as the result of country-specific events, such as transfer risks (payment of a liability is restricted or prevented by a country) and risks arising from political and / or macroeconomic events.
Management	Sales units, Trading
Indep. monitoring	Risk unit

Market risk

Definition	Market risks comprise the risk of financial losses on securities and derivatives in the bank's own portfolio as a result of changes in market factors, such as share prices, interest rates, volatilities or exchange rates (general market risks), as well as for issuer-specific reasons (specific market risks).
Sub-categories	Balance sheet interest rate risk is the risk that changes in market interest rates will impact negatively on the financial situation of the banking book. As well as affecting current interest income, changes in interest rates have implications for future results. The interest rate risk is managed based on the market interest method. Market liquidity risk is the risk that a product can no longer be easily sold (or purchased) on a market. The higher the market liquidity, the greater the chance of purchasing or selling a product for an appropriate price at the desired time. Issuer (default) risk is the risk of a loss arising from a change in fair value resulting from a credit event affecting an issuer to which the bank is exposed through marketable securities or derivatives from this issuer.
Management	Trading, Treasury
Indep. monitoring	Risk unit

Liquidity risk

Definition	Liquidity refers to the bank's capacity to settle its liabilities promptly and without restrictions. Liquidity risk is the risk that this capacity to pay will be impaired under institution or market-related stress conditions.
Sub-categories	(Re-)financing risk: Refinancing refers to the procurement of funds for the financing of assets. Refinancing risk is the risk that the bank is not in a position to procure sufficient funds at appropriate conditions for the ongoing financing of its lending business. Short-term liquidity ensures that the bank is able to make payments over a short period of time in the event of a systemic or institution-specific liquidity crisis by holding a sufficiently large inventory of high-quality liquid and unencumbered assets as a financial precaution against a temporary liquidity gap. Often, 30 calendar days are used as the definition period. The regulatory indicator for short-term liquidity is the liquidity coverage ratio (LCR). Structural liquidity has a medium-term horizon and ensures that refinancing as per the liquidity profile of the assets takes place with stable liabilities. Structural liquidity requirements specify that illiquid assets such as loans to private individuals and companies, as well as parts of the trading portfolio, are to be refinanced through long-term liabilities. The regulatory indicator for structural liquidity is the net stable funding ratio (NSFR).
Management	Treasury and Money Trading
Indep. monitoring	Risk unit

Operational risk	
Definition	Operational risks refer to potential damage caused by the inappropriateness or failure of persons, systems or processes or due to external events.
Sub-categories	IT risks refer to the potential damage caused by the loss of confidentiality, integrity and availability of data and functions in IT systems. Cyber risks comprise the risk of attacks from the Internet or similar networks (referred to as hacker attacks) on the confidentiality, integrity and availability of data and functions in IT systems.
Management	All employees, in line with their duties, competences and responsibilities in the group.
Indep. monitoring	Risk unit

Compliance risk	
Definition	Compliance risks are behavioural risks. These are risks that are caused by breaches of the law, regulations or contracts and can result in legal and regulatory sanctions, financial losses and reputational damage. Compliance is the observance of legal, regulatory and internal regulations as well as the adherence to industry standards and codes of conduct. Compliance involves ensuring that the behaviour and actions of Zürcher Kantonalbank and its employees meet applicable legal and ethical standards, and also comprises all organisational measures designed to prevent violations of the law and breaches of rules and ethical norms by Zürcher Kantonalbank, its governing bodies and its employees.
Management	Group board members and all employees
Indep. monitoring	Compliance function

Strategic risk	
Definition	Strategic risks are all possible factors of influence, events and decisions that have the potential to endanger the long-term success of the company.
Management	Board of Directors and Executive Board
Indep. monitoring	None (Board of Directors and EB act as the manager)

Business risk	
Definition	Business risk is the risk that lower business volumes and margins will reduce the group's operating result if the decline in operating income is not offset by a simultaneous drop in operating expenses. Business risks also include unplanned additional costs in the absence of correspondingly higher income. Business risks materialise when actual income falls short of the budgeted income. This can occur on a one-off and a recurring basis. Typical examples of business risks are unexpectedly decreasing margins and a lack of client demand following an economic downturn.
Management	All group employees, in line with their duties, competences and responsibilities.
Indep. monitoring	Finance unit

Reputation risk	
Definition	Reputation risk involves the risk of damage to the bank's good reputation or, in extreme cases, the risk of losing the bank's good reputation altogether. Aligning business activities to the central core values of the company is the best way in which to guarantee that the company's excellent reputation is maintained and to prevent instances in which activities have a negative impact on the bank's reputation. Reputation denotes the image that a company enjoys among its stakeholders, i. e. the bank's standing in terms of its integrity, competency, performance and reliability from the

	perspective of stakeholders. Reputational damage occurs when the perception of a stakeholder group differs from its expectations. The trustworthiness and credibility of the bank as aspects of its reputation are negatively influenced by this difference. Reputation is determined by constantly comparing perceptions and expectations over a period of time and is reflected in the company's values and identity.
Management	Group board members and all employees
Indep. monitoring	Group administrative department, Corporate Communication

Sustainability risks are events or conditions related to the environment, society or governance (ESG), the occurrence of which may have actual or potential negative effects on the bank's assets, finances and earnings, as well as on its reputation. Sustainability risks are a component of the risk categories listed above. The management of sustainability risks is an integral part of the bank's risk management processes. Climate-related financial risks are part of sustainability risks and are discussed in detail in chapter 18.

Risk tolerance

Risk tolerance includes both qualitative and quantitative considerations concerning the main risks the group is willing to accept to achieve its strategic business objectives, given its capital and liquidity planning. Risk tolerance is set for each risk category and at group level.

The qualitative elements of risk tolerance are mainly set in the form of regulations, directives and instructions. These are reviewed regularly and adjusted if necessary, but are largely medium and long-term in nature and at the strategic level, going well beyond the horizon of annual quantitative risk policy requirements.

At the Board of Directors level (strategic), the qualitative risk tolerance requirements include in particular the risk management principles set down in the risk and compliance regulations and the code of conduct, the business policy rules in the group strategy and the business policy rules in the special regulations on the individual business areas.

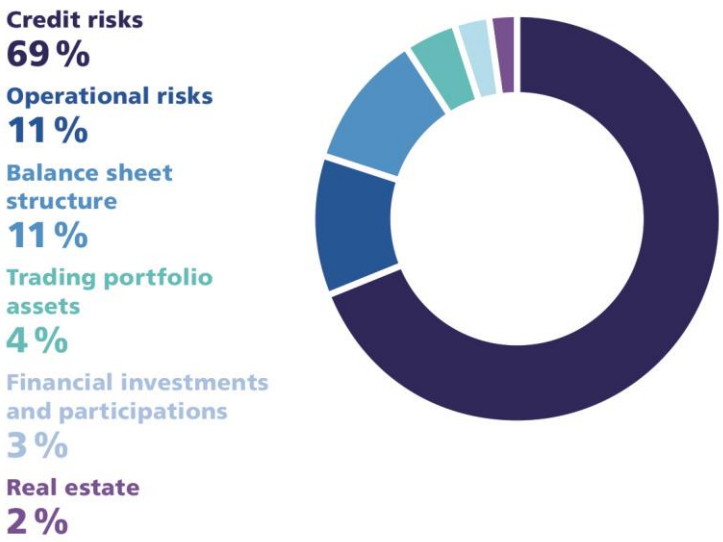
At the Executive Board level (operational), the qualitative requirements include in particular the policies for the individual business areas. Examples include the credit policy rules from the Executive Board (credit policy) or the trading mandates for the individual trading desks.

As part of the annual risk policy process the Board of Directors ensures that the risk limits and benchmarks it sets (quantitative risk tolerance) are consistent with the bank's risk capacity.

Risk capacity refers to the maximum possible total risk the bank can take without endangering its own credit rating target in a period of heavy stress lasting several years. Risk capacity in capital allocation refers to the maximum risk capital the Board of Directors can allocate on a one-year horizon. Risk capacity sets the framework for determining quantitative risk tolerance.

Risk tolerance refers to the total risk defined for all relevant business types the bank is willing to enter into, bearing in mind the strategic business objectives and the capital and liquidity planning. Risk tolerance is set annually by the Board of Directors, which approves the risk policy requirements for the following year. The Board of Directors ensures that risk tolerance is consistent with risk capacity. The allocation of capital at risk (CaR) to individual risk managers (e. g. Trading) is a key management instrument. Quantitative risk tolerance is set by the Board of Directors, mainly by allocating capital at risk to credit risk, market risk and operational risk; capital at risk for operational risk also covers compliance risk. The risk managers request risk capital from the Board of Directors based on the current risk profile, planned business activities and potential negative trends in the risk profile.

Of the CHF 13,508 million in eligible capital (total capital) at the end of 2020, a total of CHF 5,775 million was allocated to the risk business in 2021. The percentage breakdown by risk category of the allocated capital is shown below.



The figure shows that the risk profile of Zürcher Kantonalbank is strongly influenced by credit risks.

In the case of operational risks, there is no internal allocation of the cost of capital. For credit risks the risk committee of the Executive Board makes a sub-allocation to the risk management units in Sales by annually setting sub-portfolio limits.

Provided the total capital at risk requested (CaR limits) is below the previously determined risk capacity (maximum capital at risk), the Board of Directors can set risk tolerance at the level of the capital at risk requested. The process for allocating capital at risk ensures that the quantitative elements of risk tolerance and the capital strategy are mutually compatible.

In addition to capital at risk, the Board of Directors also sets every year the cost of capital rates for internal charging and other quantitative risk tolerance rules, including a limit for liquidity risk and the benchmark for the strategic investment of equity (equity benchmark).

The risk profile refers to the risk exposure taken at a given point in time, in the relevant risk categories and aggregated at bank level. The risk profile is reflected in a series of quantitative risk measurement variables and qualitative risk aspects. Limit utilisation is a major measurement and assessment criterion. Ongoing monitoring of the risk profile ensures that it remains within the risk tolerance.

For more information on how the business model interacts with the overall risk profile, please see table CRA (credit risk, page 45), table CCRA (counterparty credit risk, page 66), table MRA (market risk, page 73) and table ORA (operational risks, page 83).

Internal risk reporting

Internal and external risk reporting is guided by high industry standards in terms of objectivity, scope, transparency and timeliness. Risk transparency is fundamental if the recipients of reports are to assess risk properly. Reporting

transparency is supported by having a risk reporter organisationally independent from the units managing risk. Risk reporting covers the entire Zürcher Kantonalbank group.

Reporting to the Executive Board and Board of Directors covers all risk categories. The internal reports are produced by the independent monitoring units. The main reports are:

- The quarterly report from the CRO covering events, the risk profile and monitoring of credit, market and liquidity risk, operational risk, compliance risk reported by the General Counsel and reputation risk reported by Corporate Communications.
- The quarterly report from the CFO on the group results and strategic metrics, revenue items (interest, commission and trading business) and cost items, client development and response, change (development steps), employees and capital.
- The annual report on the suitability and effectiveness of the internal control system and the activities of Risk Control and the Compliance function.

When special developments or events occur, the Executive Board and Board of Directors are informed of changes in the risk profile in additional reports and analyses.

Monitoring reports support risk monitoring in the Risk unit and management controls in the organisational units managing risk. Monitoring reports are produced at higher frequencies for higher risk categories.

Risk data aggregation and systems

The group structure at Zürcher Kantonalbank, with a relatively small number of subsidiaries and the parent bank regionally focused on the Canton of Zurich, means that risk data aggregation is much simpler than, for example, major banks with global activities. Relative size means that the risk profile of the Zürcher Kantonalbank group is dominated by the risks at the parent bank. Where risks at subsidiaries are material for the risk profile of the group, daily or real-time data updates to the parent bank systems ensure that a reliable and up-to-date picture of the group's risk profile is available at all times.

Risk systems for credit risks

- Limit monitoring system
  The system is the group's application for managing counterparty limits and risk management structures for market and default risk. The limit monitoring system contains all credit-risk related exposures, including counterparty risks on trading transactions. Default-related data are supplied by Trading in real time. Aggregated exposure is available by group company and also at group level. Exposures are calculated for different maturity ranges. This takes into account netting and collateral, using pre-defined rules. Exposures can be coded down to individual transaction level by drilling down. The system has a pre-deal function allowing simulation of the impact of potential transactions (e. g. in Trading) on limit utilisation.
- Risk measurement: Credit Risk Portfolio Management System
  Credit risks at portfolio level are measured in the Credit Risk Portfolio Management System. It calculates, among other things, capital at risk (CaR) and expected loss (EL). Based on these, the cost of capital and the standard risk cost are determined. Exposure data is provided to the system by the limit monitoring system. This data is then enhanced with collateral information. EL calculations are run at individual client level, CaR is calculated at portfolio level. Exposure data is updated daily. It is possible with the corresponding special rights to make flexible changes to portfolio data, e.g. for stress tests, impact analyses or scenario analyses. There is also an option to use a pre-deal check to add new positions to a portfolio to see the effect on CaR.
- Reporting and analyses: Credit risk assessment platform
  The application brings together data from various sources into a single database. The data is available to the Risk business unit as raw data at the individual transaction and limit level, and can be viewed both as a current portfolio and reflecting applications. In addition to exposures and limits, the platform also contains data on collateral down to the level of individual security, property, guarantee, etc. and information on clients' group structure. The data is used for regular reports and ad hoc assessments. It is normally down-

loaded monthly from upstream systems, but is also available for other reporting dates, including retrospectively. The assessments themselves are carried out using database query tools.

Risk systems for market risks

- Measurement of trading P&L and market risk measurement
  A business intelligence solution is used to support the risk organisation in its independent P&L and risk analysis of trading positions. P&L and risk data (valuation of trading positions, P&L attributions and risk sensitivities) and the relevant market data (interest rates, exchange rates, etc.) are obtained from the front office application used by Trading. The system used offers a full plausibilisation, analysis and reporting infrastructure for currencies and securities.
  The same application measures the following key market risk ratios: capital at risk (CaR), value at risk (VaR) and stressed VaR for trading positions. This is calculated at various levels of aggregation (desk, trading area, portfolio, etc.). The application obtains a model-based valuation of all trading instruments under different market risk scenarios from the front-office application used by Trading. The market movements for the risk metrics come from a Monte Carlo simulation. The model implemented in the application is certified by FINMA for capital adequacy requirements for market risks in the general interest rates, currencies, general and specific equities, and commodities categories. Capital adequacy for specific interest rate risks uses the standardised market risk approach.
- Interest rate risk measurement on the balance sheet
  The ALM system is the application for managing the balance sheet structure in Treasury and in the Risk unit. Exposures in the banking book which are interest rate-sensitive are updated weekly, and the interest rate position is calculated based on this. The Treasury system is used by Treasury to manage interest rate risk under the market interest rate method and regulatory reporting. In terms of risk control, the ALM system is the basis for measuring interest rate risk from both the net present value and profit perspectives.

Risk systems for liquidity risks

- Liquidity risk system
  The system is a scenario-based risk system customised for Zürcher Kantonalbank to measure liquidity risk. In the system, the data for all the bank's transactions that are relevant to liquidity risk measurement are processed and categorised as per the model. Their impact on the the liquidity situation and thus also their compliance with internal requirements is simulated. The regulatory liquidity ratios are calculated based on the accounting system.

Risk systems for operational risk and compliance risk

- Operational risk and compliance risk application
  This application supports the business units plus Operational Risk and the Compliance function in defining and managing operational and compliance risks. The application is the central location for documenting risk scenarios and the associated countermeasures (such as control activities) and for classifying data, functions and systems. It is also a monitoring instrument for dealing with control activities, compliance measures and outstanding audit items.

Risk systems for reputation risk, business risk and strategic risk

- No specific systems are used to measure reputation, business or strategic risk. The Finance unit mainly uses SAP systems for accounting and controlling.

Stress testing

Stress tests are used to analyse the impact of shock events, changes to individual business parameters or longer lasting crisis scenarios on key target indicators. They are a way of analysing the ability to survive such stress events.

Zürcher Kantonalbank uses stress tests to:

- analyse the effect on the income statement, capital and liquidity of exceptional disruptions on financial markets or in the broader economy;
- perform plausibility checks and optimise capital and liquidity planning;
- develop crisis scenarios and plans to manage risk in stress situations;
- communicate risks for the group using a stress perspective.

Stress scenarios are based on one or more of the following methodologies:

- extreme historic events;
- hypotheses/scenarios formulated by experts;
- sensitivity analyses for area-specific risk factors;
- insolvency scenarios (reverse stress).

Stress testing is an integral part of risk management at Zürcher Kantonalbank. When setting the risk tolerance, Risk Control ensures that the risk limits requested from the Board of Directors are consistent with the results of stress tests.

The stress test universe at Zürcher Kantonalbank mainly consists of two components:

- Group stress test: Checking risk has been identified across all categories, taking into account the interactions between the different categories.
- Area-specific stress tests for market, liquidity and credit risk which are an integral part of individual risk measurement, for example to complement VaR as a largely model-free way of measuring market risk.

Group stress test: potential loss analysis

In the annual potential loss analysis, the Finance and Risk units jointly examine the potential impact of crisis scenarios lasting several years on profitability and the capital position. The aim of the analysis is to check the vulnerability of Zürcher Kantonalbank to crisis scenarios that are unlikely but possible. When measuring potential loss, the focus is on balance sheet and income statement items as well as the regulatory capital situation.

The starting point for the potential loss analysis is the development of scenarios by Economic Research in collaboration with the specialist areas. They draw up macro-economic scenarios which have as wide a range of impacts as possible on individual business areas. The scenarios are to an extent realistic and economically consistent, but exaggerate some trends in order to give the desired severity. Central macro-economic parameters are forecast for each scenario over a period of several years.

Based on these figures, the specialist areas estimate the impact on the group. This stage includes an analysis of the effects on the risk profile and a model-based or expert assessment of potential losses. The analyses and loss estimates produced by the specialist areas are combined in a report and validated. Finally, based on the figures from the annual financial planning, the impact on the income statement and capital is calculated and analysed over the entire horizon of the scenario. In medium-term planning, the scenario selected is used to critically review the stress reserves and capital position overall and define any action required.

In addition to the group's own potential loss analysis, FINMA regularly provides stress scenarios for review and compares the impact between the different banks. The processing of this "regulatory potential loss analysis (PLA)" is coordinated with the internal potential loss analysis whenever possible. The results of the regulatory PLA are discussed with FINMA and integrated into internal risk reporting.

Area-specific stress tests

Zürcher Kantonalbank uses stress testing as a management and monitoring tool, among others, in the following areas:

- Credit risk stress test
  Risk Control runs sensitivity and scenario analyses as part of the process for setting the risk tolerance (CaR) for credit risk. The parameters in the credit risk portfolio model are varied to differing degrees and the impact on the estimated portfolio loss and risk capital requirement is analysed. Other stress tests are carried out on an ad hoc basis to analyse the credit risk profile of sub-portfolios.
- Market risk stress test
  Market risk in trading: stress testing is an integral part of measuring market risk. Losses on trading positions caused by extraordinary market movements are calculated, analysed and monitored. Historically observed stress events are a key element in defining and updating a broad set of stress scenarios, including hypothetical ones. The matrix stress test measures the sensitivity of a trading position to large movements in a combination of individual market parameters. In addition to the value at risk calculated every day based on current market conditions, a stressed VaR is also calculated. Stressed VaR is based on the same model as VaR, but calibrated on the basis of changes in the value of the risk factors observed in a period of significant market stress.
- Interest rates risks on the balance sheet
  From the net present value perspective, the aim of stress testing is to limit potential losses in net present value resulting from a sudden and extreme interest rate scenario. The scenarios used are abrupt interest rate shocks and cover all relevant movements in the yield curve (parallel shifts, twists and steepening). Both internal and regulatory scenarios are used in accordance with FINMA Circular 2019/2 "Interest rate risk – Banks". From the income perspective, stress testing is based on extreme interest rate scenarios with a horizon of one year. The respective structural contribution over the simulation horizon is calculated for each scenario. The stress test indicator is calculated as the difference between the lowest structural contribution of all scenarios and that in the steady state scenario, in which the yield curve is kept unchanged across the entire simulation horizon.
- Liquidity risk
  For liquidity risk, in addition to the regulatory metric the bank uses a stress scenario-based risk measure for short-term liquidity: the "minimum liquidity buffer up to day 22 under the standard stress scenario". From a set of various stress scenarios, the one with the most serious liquidity deterioration is chosen as the basis for risk measurement: a bank-specific bank run. The starting point for the calculation is the existing buffer of liquid assets. Based on this, for each successive day, the internal model calculates inflows and outflows for various product groups, which increase or reduce the liquidity reserve. The scenario includes, for example, the loss of maturing funding, an outflow of liquidity from all liability items that threatens the existence of the bank and no renewals of term deposits. The liquidity left after the 22nd day of the scenario is the internal risk measurement. The Board of Directors sets the risk tolerance for liquidity risks with the regulatory LCR. The Executive Board supplements this requirement with a minimum value from internal measurement.

For more information on risk management, strategies and processes, internal reporting and the internal control system, please see table CRA (credit risk, page 45), table CCRA (counterparty credit risk, page 66), table MRA (market risk, page 73) and table ORA (operational risks, page 83).

4.4 OV1: Overview of RWA

		a	b	c
		RWA	RWA	Minimum capital requirements
in CHF million		**31.12.2021**	**30.06.2021**	**31.12.2021**
1	Credit risk (excluding CCR – counterparty credit risk) [1]	51,449	50,638	4,116
2	of which standardised approach (SA) [1]	6,709	7,650	537
3	of which foundation internal ratings-based (F-IRB) approach	27,357	26,162	2,189
4	of which supervisory slotting approach	–	–	–
5	of which advanced internal ratings-based (A-IRB) approach [2]	17,384	16,827	1,391
6	Counterparty credit risk (CCR)	6,865	7,685	549
7	of which standardised approach for counterparty credit risk (SA-CCR)	3,741	4,606	299
7a	of which simplified standard approach (SSA-CCR)	–	–	–
7b	of which current exposure method	–	–	–
8	of which internal model method (IMM)	–	–	–
9	of which other CCR [3]	3,124	3,079	250
10	Credit valuation adjustment (CVA)	2,859	3,135	229
11	Equity positions under the simple risk weight approach	586	556	47
12	Investments in funds – look-through approach	–	–	–
13	Investments in funds – mandate-based approach	–	–	–
14	Investments in funds – fall-back approach	543	549	43
14a	Investments in funds – simplified approach	–	–	–
15	Settlement risk	1	1	0
16	Securitisation exposures in banking book	–	–	–
17	of which securitisation internal ratings-based approach (SEC-IRBA)	–	–	–
18	of which securitisation external ratings-based approach (SEC-ERBA), including internal assessment approach (IAA)	–	–	–
19	of which securitisation standardised approach (SEC-SA)	–	–	–
20	Market risk	3,537	2,988	283
21	of which standardised approach (SA)	1,554	1,320	124
22	of which internal model approaches (IMA)	1,984	1,668	159
23	Capital charge for switch between trading book and banking book	–	–	–
24	Operational risk	4,660	4,566	373
25	Amounts below the thresholds for deduction (subject to 250% risk weight)	1,051	1,048	84
26	Floor adjustment	–	–	–
27	**Total**	**71,553**	**71,166**	**5,724**

[1] According to FINMA Circ. 16/1, non-counterparty-related risks are also to be taken into account in this row.

[2] Zürcher Kantonalbank essentially uses the foundation IRB approach (F-IRB approach). For the IRB segment Retail, however, only the advanced IRB approach (A-IRB approach) exists, so the RWA and minimum capital requirements for the IRB segment Retail are disclosed in this row.

[3] Zürcher Kantonalbank uses the comprehensive approach for credit risk mitigation and the calculation of the credit equivalent for securities financing transactions (SFT).

RWA rose by CHF 387 million to CHF 71,553 million overall compared with 30 June 2021. The increase in RWA for credit risk (CHF + 811 million) essentially offset the decrease in RWA for counterparty credit risk (CHF - 820 million). RWA for market risk increased by CHF 549 million, while RWA for the other risk categories remained essentially unchanged compared with 30 June 2021. For further information on the reasons for the changes please see the relevant detailed tables.

5 Linkages between accounting and regulatory exposure amounts

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

31.12.2021 in CHF million	a and b [1, 2] Carrying values under the scope of accounting and regulatory consolidation	c Carrying values of items subject to credit risk framework [3]	d Carrying values of items subject to counterparty credit risk framework	e Carrying values of items subject to securitisation framework	f Carrying values of items subject to market risk framework	g Not subject to capital requirements or subject to deduction from capital
Assets						
Liquid assets	40,883	40,883	–	–	–	–
Amounts due from banks	3,173	2,954	220	–	–	–
Amounts due from securities financing transactions	26,289	–	26,289	–	–	–
Amounts due from customers	9,891	9,428	464	–	–	–
Mortgage loans	91,847	91,847	–	–	–	–
Trading portfolio assets	12,442	31	–	–	12,411	–
Positive replacement values of derivative financial instruments	1,272	–	1,272	–	1,272	–
Other financial instruments at fair value	–	–	–	–	–	–
Financial investments	4,759	4,584	–	–	175	–
Accrued income and prepaid expenses	280	280	–	–	–	–
Non-consolidated participations	155	155	–	–	–	–
Tangible fixed assets	597	597	–	–	–	–
Intangible assets	50	–	–	–	–	50
Other assets	467	460	–	–	–	6
Total assets	**192,105**	**151,219**	**28,244**	**–**	**13,858**	**56**
Liabilities						
Amounts due to banks	34,897	–	83	–	–	34,814
Liabilities from securities financing transactions	4,403	–	4,403	–	–	–
Amounts due in respect of customer deposits	96,777	–	8	–	–	96,769
Trading portfolio liabilities	1,943	–	–	–	1,943	–
Negative replacement values of derivative financial instruments	1,116	–	1,116	–	1,116	–
Liabilities from other financial instruments at fair value	4,387	–	–	–	4,387	–
Cash bonds	135	–	–	–	–	135
Bond issues	22,779	–	–	–	–	22,779
Central mortgage institution loans	11,307	–	–	–	–	11,307
Accrued expenses and deferred income	787	–	–	–	–	787
Other liabilities	661	–	–	–	–	661
Provisions	237	–	–	–	–	237
Total liabilities	**179,431**	**–**	**5,610**	**–**	**7,447**	**167,489**

[1] If a bank's scope of accounting consolidation and its scope of regulatory consolidation are exactly the same, columns a and b should be merged. This is applicable to Zürcher Kantonalbank.

[2] Where a single item attracts capital charges according to more than one risk category framework, it should be reported in all columns that it attracts a capital charge. As a consequence, the sum of amounts in columns c to g may be greater than the amount in column a and b.

[3] Includes liquid assets, trading portfolio assets, equities, accrued income and prepaid expenses and non-counterparty-related risks in the amount of CHF 42,514 million.

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

31.12.2021 in CHF million		a Total	b Positions subject to credit risk framework	d Positions subject to counterparty credit risk	c Positions subject to securitisation framework	e Positions subject to market risk framework [1]
1	Asset carrying value amount under regulatory scope of consolidation (as per Table LI1)	193,321	151,219	28,244	–	13,858
2	Liabilities carrying value amount under regulatory scope of consolidation (as per Table LI1)	13,057	–	5,610	–	7,447
3	Total net amount under regulatory scope of consolidation	180,263	151,219	22,633	–	6,411
4	Off-balance sheet amounts [2]	14,898	8,666	–	–	–
5	Revocable commitments [2]	27,193	14,949	–	–	–
6	Differences due to consideration of value adjustments and provisions	438	437	1	–	–
7	Amounts below the thresholds for deduction (subject to 250% risk weight)	-420	-420	–	–	–
8	Net position of central mortgage institution bonds and loans	-2,980	-2,980	–	–	–
9	Consideration of financial collateral	-744	-744	–	–	–
10	Differences due to the calculation of credit equivalents for derivatives	9,773	–	9,773	–	–
11	Differences due to the use of the comprehensive approach for credit risk mitigation (for SFTs)	-15,731	–	-15,731	–	–
12	Other differences	-6,442	-33	–	–	-6,410
13	**Exposure amounts considered for regulatory purposes**	**187,772**	**171,094**	**16,677**	**–**	**1**

[1] Exposure at default is only calculated for securitisation exposures in the trading book, resulting in a difference between carrying values and exposure amounts considered for regulatory purposes.

[2] According to FINMA Circ. 16/1, off-balance sheet original exposures are to be disclosed in column a and the amounts after application of the credit conversion factors (CCFs) in columns b to e. Hence, the total amount in column a does not equal the sum of positions from columns b to e. The same method is applied for revocable commitments.

5.3 Explanations of differences between accounting and regulatory exposure amounts

Differences between accounting and regulatory exposure amounts

Table LI2 shows the main differences between accounting and regulatory exposure amounts, which can be summarised as follows:

- Off-balance sheet amounts (row 4)
- Revocable commitments (row 5)
- Differences due to consideration of value adjustments and provisions (row 6)
- Amounts below the thresholds for deduction (subject to 250% risk weight) (row 7)
- Net position of central mortgage institution bonds and loans (row 8)
- Consideration of financial collateral (row 9)
- Differences due to the calculation of credit equivalents for derivatives (row 10)
- Differences due to the use of the comprehensive approach for credit risk mitigation (for SFTs) (row 11)
- Other differences (row 12)

Trading portfolio assets and liabilities

These exposures are actively managed to benefit from market price movements, i. e. there is an ongoing willingness to increase, reduce, close out or hedge the risk position. The intention to make an arbitrage profit also counts as a trading portfolio asset. When a transaction is executed, it must be classified as a trading portfolio asset and documented accordingly.

Trading portfolio assets are always measured and recognised at fair value. Where, as an exception, no fair value is ascertainable, valuation and recognition must follow the principle of the lower of cost or market value.

The group handbook specifies the following rules for measuring balance sheet exposures which may contain trading portfolio assets measured at fair value:

Balance sheet item	Content	Valuation rules
Trading portfolio assets	All securities and precious metals (physical or in an account) held and owned by the bank for trading purposes. Money market receivables held for trading.	Recognised at fair value.
Positive replacement values of derivative financial instruments	Derivative financial instruments must be treated as trading portfolio assets unless used with structured products or for hedging.	Derivative financial instruments are valued at fair value and, in principle, represent trading portfolio assets. Hedging transactions are also measured at fair value, except for the derivative financial instruments used to hedge interest rate risk within the scope of asset and liability management. In this case, value changes are recognised in the Compensation account with no income effect.
Other financial instruments at fair value	Assets related to own issues of structured products with own debt instruments which satisfy the conditions for using the fair value option.	All recognised at fair value provided all the conditions in Accounting Ordinance (RelV-FINMA) and FINMA Circular 2020/1 "Accounting - banks" are met.
Trading portfolio liabilities	Short positions.	Recognised at fair value.
Negative replacement values of derivative financial instruments	Derivative financial instruments must be treated as trading portfolio assets unless used with structured products or for hedging.	Derivative financial instruments are valued at fair value and, in principle, represent trading portfolio assets.
Liabilities from other financial instruments at fair value	Liabilities related to own issues of structured products with own debt instruments which satisfy the conditions for using the fair value option.	All recognised at fair value provided all the conditions in Accounting Ordinance (RelV-FINMA) and FINMA Circular 2020/1 "Accounting - banks" are met.

The fair value used can either be a price set on a price-efficient and liquid market or a theoretical price determined based on a valuation model. In the latter case, all the following conditions for price calculation must be met:

- the bank's internal valuation and risk measurement models take appropriate account of all relevant risks;
- the input factors for the bank's internal valuation and risk measurement models are complete and appropriate;
- the bank's internal valuation and risk measurement models, including the inputs used, are scientifically sound, robust and consistently applied;
- controls are effective, especially the controls on model, measurement and the calculation of daily profit or loss carried out by an internal risk control unit that is independent from trading;
- the traders, independent controller and risk manager are close to the market and familiar with them.

Systems and controls in connection with the valuation of trading portfolio assets

The Trading unit enters trading portfolio assets in the Frontarena system. Settlement and position management is carried out in a designated position management system (the back office system WSA), which sources transactions from Frontarena. Accounting (secondary ledger) for all trading transactions is in SAP CFM.

Prices are checked for plausibility in the front office systems by Market Risk to calculate the ongoing trading P&L and reconcile the front office and back office systems every day.

Trading portfolio assets are valued using the prices and valuations in Frontarena. The valuation parameters for calculating the trading P&L are checked independently by Market Risk.

For financial reporting, the prices supplied by Frontarena are checked for plausibility by Accounting and monitored using consistency controls. Every month, the accounting gain or loss on trading is reconciled with the reported P&L by the Risk Control unit.

Positions in the trading book are priced using the data and data sources applied in Market Risk. These pricing rules are set by type of instrument, by Market Risk.

The following figure provides an overview of the valuation methods used for trading portfolio assets by type of instrument.

Instrument	Valuation / price
Bonds CHF/EUR	Market price
Swap CHF/non-CHF	Theoretical
Credit default swaps (CDS)	Theoretical
Equity securities/indices	Market price
Futures	Market price
Equity/index options	Theoretical
Commodities	Market price
PM futures	Market price
PM and commodity options	Theoretical
Gold and fund ETFs	Theoretical
FX options/warrants	Theoretical
Structured products	Theoretical

For further information on market risk management, please see table MRA starting from page 73.

5.4 PV1: Prudential valuation adjustments (PVA)

Zürcher Kantonalbank made no prudential value adjustments either in the previous reporting period or as at the reporting date.

6 Composition of regulatory capital

6.1 CC1: Presentation of regulatory capital

31.12.2021 in CHF million		a Amounts	b References
Common equity (CET1)			
1	Issued and paid-in capital, fully eligible	2,425	J
2	Retained earnings reserves, including reserves for general banking risks / profit (loss) carry forwards and profit (loss) for the period	10,259	
	of which voluntary retained earnings reserve	9,163	
	of which reserves for general banking risks	154	
	of which profit (loss) for the current period	942	
	of which planned dividend	–	
	of which planned retained profit	512	
3	Capital reserves and foreign currency translation reserve (+/-) and other reserves	-9	
4	Issued and paid in capital, subject to phase-out	–	
5	Minority interests, eligible as CET1 capital	–	L
6	Common Equity Tier 1 capital before regulatory adjustments	12,244	
	CET1: regulatory adjustments		
7	Prudential valuation adjustments	–	
8	Goodwill (net of related tax liability)	-42	A, F
9	Other intangibles other than mortgage servicing rights (net of related tax liability)	-8	B, G
10	Deferred tax assets that rely on future profitability	-6	D
11	Cash flow hedge reserve (-/+)	–	
12	IRB shortfall of provisions to expected losses	–	
13	Securitisation gain on sale	–	
14	Gains or losses due to changes in own credit risk	–	
15	Defined-benefit pension fund net assets (net of related tax liability)	–	
16	Net long position in own CET1 instruments	–	
17	Reciprocal cross-holdings in common equity (CET1 instruments)	–	
17a	Qualified participations where a controlling influence is exercised together with other owners (CET1 instruments)	–	
17b	Immaterial participations (CET1 instruments)	–	
18	Non-qualified participations (max. 10%) in the financial sector (amount above Threshold 1) (CET1 instruments)	–	
19	Other qualified participations in the financial sector (amount above Threshold 2) (CET1 instruments)	–	
20	Mortgage servicing rights (amount above Threshold 2)	–	C, H
21	Other deferred tax assets arising from temporary differences (amount above Threshold 2)	–	E
22	Amount exceeding Threshold 3 (15%)	–	
23	of which other qualified participations	–	
24	of which mortgage servicing rights	–	
25	of which other deferred tax assets arising from temporary differences	–	
26	Expected losses on equity investments treated under the PD / LGD approach	–	
26a	Other adjustments in the case of financial statements prepared in accordance with internationally recognised accounting standards	–	
26b	Other deductions	–	
27	Amount by which the AT1 deductions exceed the AT1 capital	–	
28	Total regulatory adjustments to CET1	-56	
29	**Common Equity Tier 1 capital (net CET1)**	**12,188**	
Additional Tier 1 capital (AT1)			
30	Issued and paid in instruments, fully eligible	1,065	
31	of which classified as equity under applicable accounting standards	–	K
32	of which classified as liabilities under applicable accounting standards	1,065	
33	Issued and paid in instruments, subject to phase out	–	
34	Minority interests eligible as AT1	–	M
35	of which subject to phase out	–	
36	Additional Tier 1 capital before regulatory adjustments	1,065	

31.12.2021		a	b
in CHF million		Amounts	References
	Additional Tier 1 capital: regulatory adjustments		
37	Net long position in own AT1 instruments	–	
38	Reciprocal qualified cross-holdings in AT1 instruments	–	
38a	Qualified participations where a controlling influence is exercised together with other owners (AT1 instruments)	–	
38b	Immaterial participations (AT1 instruments)	–	
39	Non-qualified participations (max. 10%) in the financial sector (amount above Threshold 1) (AT1 instruments)	–	
40	Other qualified participations in the financial sector (AT1 instruments)	–	
41	Other deductions	–	
42	Amount by which the T2 deductions exceed the T2 capital	–	
42a	AT1 deductions covered by CET1 capital	–	
43	Total regulatory adjustments to AT1	–	
44	Additional Tier 1 capital (net AT1)	1,065	
45	**Tier 1 capital (net Tier 1 = net CET1 + net AT1)**	**13,253**	
Tier 2 capital (T2)			
46	Issued and paid in instruments, fully eligible	518	
47	Issued and paid in instruments, subject to phase-out	–	
48	Minority interests eligible as T2	–	
49	of which subject to phase out	–	
50	Valuation adjustments; provisions and depreciation for prudential reasons; compulsory reserves on financial investments	294	
51	Tier 2 capital before regulatory adjustments	812	
	Tier 2 capital: regulatory adjustments		
52	Net long position in own T2 instruments and other TLAC instruments	-2	
53	Reciprocal cross-holdings in T2 instruments and other TLAC instruments	–	
53a	Qualified participations where a controlling influence is exercised together with other owners (T2 instruments and other TLAC instruments)	–	
53b	Immaterial participations (T2 instruments and other TLAC instruments)	–	
54	Non-qualified participations (max. 10%) in the financial sector (amount above Threshold 1) (T2 instruments and other TLAC instruments)	–	
55	Other qualified participations in the financial sector (T2 instruments and other TLAC instruments)	–	
56	Other deductions	–	
56a	T2 deductions covered by AT1 capital	–	
57	Total regulatory adjustments to T2	-2	
58	**Tier 2 capital (net T2)**	**810**	
59	**Regulatory capital (net T1 + net T2)**	**14,063**	
60	**Total risk-weighted assets**	**71,553**	
Capital ratios [1]			
61	CET1 ratio (item 29, as a percentage of risk-weighted assets)	17.0%	
62	T1 ratio (item 45, as a percentage of risk-weighted assets)	18.5%	
63	Regulatory capital ratio (item 59, as a percentage of risk-weighted assets)	19.7%	
64	Institute specific CET1 buffer requirements in accordance with the Basel minimum standards (capital buffer + countercyclical buffer according to Art. 44a CAO + capital buffer for systemically important banks) (as a percentage of risk-weighted assets)	2.5%	
65	of which capital buffer in accordance with Basel minimum standards (as a percentage of risk-weighted assets)	2.5%	
66	of which countercyclical buffer in accordance with the Basel minimum standards (Art. 44a CAO, as a percentage of risk-weighted assets)	0.0%	
67	of which capital buffer for systemically important institutions in accordance with the Basel minimum standards (as a percent-age of risk-weighted assets)	–	
68	CET1 available after meeting the bank's minimum capital requirements (in %)	11.7%	
68a	CET1 total requirement target in accordance with Annex 8 of the CAO plus the countercyclical buffers according to Art. 44 and Art. 44a CAO (as a percentage of risk-weighted assets)	–	
68b	of which countercyclical buffers according to Art. 44 and Art. 44a CAO (as a percentage of risk-weighted assets)	–	
68c	CET1 available (as a percentage of risk-weighted assets)	–	
68d	T1 total requirement in accordance with Annex 8 CAO plus the countercyclical buffers according to Art. 44 and Art. 44a CAO (as a percentage of risk-weighted assets)	–	
68e	T1 available (as a percentage of risk-weighted assets)	–	
68f	Total requirement for regulatory capital as per Annex 8 CAO plus the countercyclical buffers according to Art. 44 and Art. 44a CAO (as a percentage of risk-weighted assets)	–	
68g	Regulatory capital available (as a percentage of risk-weighted assets)	–	

[1] Systemically important banks can disregard Rows 68a – 68g as Annex 8 of the CAO does not apply to them.

31.12.2021 in CHF million		a Amounts	b References
Amounts below the thresholds for deduction (before risk-weighting)			
72	Non-qualified participations in the financial sector	721	
73	Other qualified participations in the financial sector (CET1)	423	
74	Mortgage servicing rights	–	
75	Other deferred tax assets	–	
Applicable caps on the inclusion of items in T2			
76	Valuation adjustments eligible in T2 in the context of the SA-BIS approach	–	
77	Cap on inclusion of valuation adjustments in T2 in the context of the SA-BIS approach	–	
78	Valuation adjustments eligible in T2 in the context of the IRB approach	–	
79	Cap on inclusion of valuation adjustments in T2 in the context of the IRB approach	–	
Capital instruments with phase out (1.1.2018 – 1.1.2022) according to Art. 141 CAO			
80	Cap on CET1 instruments with phase out	–	
81	Amount not included in CET1 (above cap)	–	
82	Cap on AT1 instruments with phase out	–	
83	Amount not included in AT1 (above cap)	–	
84	Cap on T2 instruments with phase out	–	
85	Amount not included in T2 (above cap)	–	

In terms of regulatory capital, only Common Equity Tier 1 capital shows a significant change compared to 30 June 2021, rising by CHF 527 million. The increase is mainly due to the retained profit for 2021, which amounts to CHF 512 million. There were no material changes in Additional Tier 1 capital (AT1) or Tier 2 capital (T2) in the second half of 2021. Combined with essentially unchanged RWA (see Table OV1 on page 27 for details), this resulted in a rise in capital ratios of 0.6 percentage points (CET1 ratio and T1 ratio) and 0.7 percentage points (regulatory capital ratio).

6.2 CC2: Reconciliation of regulatory capital to balance sheet

Balance sheet 31.12.2021 in CHF million	a and b As in financial statements / Under regulatory scope of consolidation [1]	c References
Assets		
Liquid assets	40,883	
Amounts due from banks	3,173	
Amounts due from securities financing transactions	26,289	
Amounts due from customers	9,891	
Mortgage loans	91,847	
Trading portfolio assets	12,442	
Positive replacement values of derivative financial instruments	1,272	
Other financial instruments at fair value	–	
Financial investments	4,759	
Accrued income and prepaid expenses	280	
Non-consolidated participations	155	
Tangible fixed assets	597	
Intangible assets	50	
of which goodwill	42	A
of which other intangibles, other than mortgage servicing rights	8	B
of which mortgage servicing rights	–	C
Ohter assets	467	
of which deferred tax assets that rely on future profitability	6	D
of which deferred tax assets arising from temporary differences	–	E
Capital not paid in	–	
Total assets	**192,105**	

[1] One completed column is sufficient at the level of the single-entity financial statement and consolidated financial statement provided that the scope of consolidation for accounting purposes is identical to that for regulatory purposes. This is applicable to Zürcher Kantonalbank.

Balance sheet 31.12.2021 in CHF million	a and b As in financial statements / Under regulatory scope of consolidation [1]	c References
Liabilities		
Amounts due to banks	34,897	
Liabilities from securities financing transactions	4,403	
Amounts due in respect of customer deposits	96,777	
Trading portfolio liabilities	1,943	
Negative replacement values of derivative financial instruments	1,116	
Liabilities from other financial instruments at fair value	4,387	
Cash bonds	135	
Bond issues	22,779	
Central mortgage institution loans	11,307	
Accrued expenses and deferred income	787	
Other liabilities	661	
Provisions	237	
of which deferred tax liabilities related to goodwill	–	F
of which deferred tax liabilities related to other intangible assets, other than mortgage servicing rights	–	G
of which deferred tax liabilities related to mortgage servicing rights	–	H
of which liabilities in connection with occupational pension plans	–	I
Total liabilities	**179,431**	
of which subordinated liabilities eligible as Tier 2 capital (T2)	810	
of which subordinated liabilities eligible as Additional Tier 1 capital (AT1)	1,065	
Equity		
Reserves for general banking risks	154	
Bank's capital	2,425	
of which eligible as CET1	2,425	J
of which eligible as AT1	–	K
Statutory reserves / voluntary reserves / profits (losses) carried forward / profit (loss) for the period	10,096	
of which voluntary retained earnings reserve	9,163	
of which foreign currency translation reserve	-9	
of which profit (loss) for the current period	942	
of which planned dividend	–	
of which planned retained profit	512	
(Own shares)	–	
Minority interests	–	
of which eligible as CET1	–	L
of which eligible as AT1	–	M
Total equity	**12,674**	

[1] One completed column is sufficient at the level of the single-entity financial statement and consolidated financial statement provided that the scope of consolidation for accounting purposes is identical to that for regulatory purposes. This is applicable to Zürcher Kantonalbank.

Scope of consolidation group

The scope of consolidation used to calculate capital requirements is equal to the one used to draw up the consolidated financial statements. In addition to the parent company Zürcher Kantonalbank, the group's scope of consolidation includes all material directly and indirectly held subsidiaries: Zürcher Kantonalbank Finance (Guernsey) Ltd., Zürcher Kantonalbank Österreich AG, ZKB Securities (UK) Ltd. and the Swisscanto group, consisting of Swisscanto Holding AG with its subsidiaries and their subsidiaries (Swisscanto Fund Management Company Ltd., Swisscanto Pensions Ltd., Swisscanto Private Equity CH I Ltd and Swisscanto Asset Management International SA). Non-material (from an accounting perspective) majority participations in Zürcher Kantonalbank Representações Ltda., ZüriBahn AG and Philanthropy Services AG are not fully consolidated.

Equity instruments of companies in the financial sector are treated as described in Articles 33 - 40 CAO. The portion above a threshold is deducted directly from equity; the portion below the threshold is risk-weighted. Book values in the accounting and regulatory scopes of consolidation are the same.

Material changes in the scope of consolidation of the group compared with the previous period

There were no changes to the scope of consolidation of the group compared with the previous period.

Scope of consolidation parent company

The parent company's capital has been calculated on a solo consolidated basis since 31 December 2012. Under Art. 10 para. 3 CAO, FINMA can allow a bank to consolidate group companies operating in the financial sector at individual institution level (solo consolidation) on account of their particularly close relationship to the bank. FINMA has ruled that Zürcher Kantonalbank may consolidate the subsidiary Zürcher Kantonalbank Finance (Guernsey) Ltd. on a solo basis under the individual institution provisions since 2012. There are no other differences between the regulatory and accounting scopes of consolidation.

Material changes in the scope of consolidation of the parent company compared with the previous period

There were no significant changes to the scope of consolidation of the parent company compared with the previous period.

6.3 CCA: Main features of regulatory capital instruments and of other TLAC-eligible instruments

31.12.2021		Endowment capital	Tier 1 bond
1	Issuer	Zürcher Kantonalbank	Zürcher Kantonalbank
2	Unique identifier (e.g. CUSIP, ISIN or Bloomberg ID for private placement)	n/a	CH0361532945
3	Governing law of the instrument	Swiss law	Swiss law
3a	Manner in which the enforceability criterion under section 13 of the TLAC Term Sheet is met (for other eligible TLAC instruments under foreign law)	n/a	n/a
	Regulatory treatment		
4	During the Basel III transitional phase	Common equity Tier 1 (CET1)	Additional Tier 1 (AT1)
5	Under Basel III rules not taking into account transitional treatment	Common equity Tier 1 (CET1)	Additional Tier 1 (AT1)
6	Eligible at single-entity, group / single-entity and group levels	Solo and group level	Solo and group level
7	Instrument type	Other instruments	Hybrid instrument
8	Amount recognised in regulatory capital (in CHF million)	CHF 2,425 million	CHF 750 million
9	Par value of instrument	CHF 2,425 million	CHF 750 million
10	Accounting classification	Bank's capital	Liability - notional
11	Original date of issuance	15.02.1870	30.06.2017
12	Perpetual or dated	Perpetual	Perpetual
13	Original maturity date	n/a	n/a
14	Issuer call option (subject to prior supervisory authority approval)	No	Yes
15	Optional call date / contingent call dates (tax and / or regulatory event) / redemption amount	n/a	First possible termination date 30.10.2023. Redemption amount: entire outstanding issue, no partial termination
16	Subsequent call dates, if applicable	n/a	Thereafter annually on interest date of 30 Oct
	Dividend / coupon		
17	Fixed or floating dividend / coupon	Floating	Fixed
18	Coupon rate and related index, if applicable	n/a	Fixed at 2.125% until 30.10.2023; thereafter reset every 5 years based on 5-year mid-swap (minimum 0.00%) plus 2.125% risk premium
19	Existence of a dividend stopper (non-payment of dividend on the instrument prohibits the payment of dividends on common shares)	n/a	Yes
20	Coupon / Dividend payment fully discretionary, partially discretionary or mandatory	Fully discretionary	Fully discretionary
21	Existence of step up or other incentive to redeem	No	No
22	Non-cumulative or cumulative	Non-cumulative	Non-cumulative
23	Convertible / non-convertible	Non-convertible	Non-convertible
24	If convertible: conversion trigger	n/a	n/a
25	If convertible: fully or partially	n/a	n/a
26	If convertible: conversion rate	n/a	n/a
27	If convertible: mandatory or optional conversion	n/a	n/a
28	If convertible: specify instrument type convertible into	n/a	n/a
29	If convertible: specify issuer of instrument it converts into	n/a	n/a
30	Write-down feature	No	Yes
31	If write-down feature: write-down trigger(s)	n/a	Common equity Tier 1 (CET1) capital ratio falls below 7% and / or FINMA declares PONV (point-of-non-viability). Write-down triggered by FINMA on a contractual basis.
32	If write-down feature: fully or partially	n/a	Always partially where a trigger event occurs (CET1 ratio below 7%) that persists until the subsequent trigger test date; always fully where a trigger event occurs (CET1 ratio below 7%) that persists until the subsequent trigger test date, if in the opinion of FINMA a partial write-down would be inadequate or if a point of non-viability (PONV) has been reached.
33	If write-down feature: permanent or temporary	n/a	Permanent
34	If temporary write-down: description of write-up mechanism	n/a	n/a
34a	Type of subordination	Contractual	Contractual
35	Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument)	Tier 1 bonds	Tier 2 bond
36	Features that prevent full recognition under Basel III	No	No
37	If yes: description of non-compliant features	n/a	n/a

31.12.2021		Tier 1 bond	EUR Tier 2 bond
1	Issuer	Zürcher Kantonalbank	Zürcher Kantonalbank
2	Unique identifier (e.g. CUSIP, ISIN or Bloomberg ID for private placement)	CH0536893321	XS1245290181
3	Governing law of the instrument	Swiss law	Swiss law
3a	Manner in which the enforceability criterion under section 13 of the TLAC Term Sheet is met (for other eligible TLAC instruments under foreign law)	n/a	n/a
	Regulatory treatment		
4	During the Basel III transitional phase	Additional Tier 1 (AT1)	Tier 2 (T2)
5	Under Basel III rules not taking into account transitional treatment	Additional Tier 1 (AT1)	Tier 2 (T2)
6	Eligible at single-entity, group / single-entity and group levels	Solo and group level	Solo and group level
7	Instrument type	Hybrid instrument	Hybrid instrument
8	Amount recognised in regulatory capital (in CHF million)	CHF 315 million	CHF 516 million
9	Par value of instrument	CHF 315 million	EUR 500 million
10	Accounting classification	Liability - notional	Liability - notional
11	Original date of issuance	16.10.2020	15.06.2015
12	Perpetual or dated	Perpetual	Dated
13	Original maturity date	n/a	15.06.2027
14	Issuer call option (subject to prior supervisory authority approval)	Yes	Yes
15	Optional call date / contingent call dates (tax and / or regulatory event) / redemption amount	First possible termination date 16.04.2027. Redemption amount: entire outstanding issue, no partial termination	First possible termination date 15.06.2022. Redemption amount: entire outstanding issue, no partial termination
16	Subsequent call dates, if applicable	Thereafter every five years on 16 April	n/a
	Dividend / coupon		
17	Fixed or floating dividend / coupon	Fixed	Fixed
18	Coupon rate and related index, if applicable	Fixed at 1.75% until 16.04.2027; thereafter reset every five years based on 5-year SARON-mid-swap (minimum 0%) plus 1.75% risk premium	Fixed at 2.625% until 15.06.2022; thereafter reset based on 5-year mid-swap plus 1.85% risk premium
19	Existence of a dividend stopper (non-payment of dividend on the instrument prohibits the payment of dividends on common shares)	Yes	No
20	Coupon / Dividend payment fully discretionary, partially discretionary or mandatory	Fully discretionary	Mandatory
21	Existence of step up or other incentive to redeem	No	No
22	Non-cumulative or cumulative	Non-cumulative	n/a
23	Convertible / non-convertible	Non-convertible	Non-convertible
24	If convertible: conversion trigger	n/a	n/a
25	If convertible: fully or partially	n/a	n/a
26	If convertible: conversion rate	n/a	n/a
27	If convertible: mandatory or optional conversion	n/a	n/a
28	If convertible: specify instrument type convertible into	n/a	n/a
29	If convertible: specify issuer of instrument it converts into	n/a	n/a
30	Write-down feature	Yes	Yes
31	If write-down feature: write-down trigger(s)	Common equity Tier 1 (CET1) capital ratio falls below 7% and / or FINMA declares PONV (point-of-non-viability). Write-down triggered by FINMA on a contractual basis.	Common equity Tier 1 (CET1) capital ratio falls below 5% and / or FINMA declares PONV (point-of-non-viability). Write-down triggered by FINMA on a contractual basis.
32	If write-down feature: fully or partially	Always partially where a trigger event occurs (CET1 ratio below 7%) that persists until the subsequent trigger test date; always fully where a trigger event occurs (CET1 ratio below 7%) that persists until the subsequent trigger test date, if in the opinion of FINMA a partial write-down would be inadequate or if a point of non-viability (PONV) has been reached.	Always fully where a trigger event occurs (CET1 ratio below 5%) that persists until the subsequent trigger test date or if a point of non-viability (PONV) has been reached.
33	If write-down feature: permanent or temporary	Permanent	Permanent
34	If temporary write-down: description of write-up mechanism	n/a	n/a
34a	Type of subordination	Contractual	Contractual
35	Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument)	Tier 2 bond	Non-subordinated liabilities
36	Features that prevent full recognition under Basel III	No	No
37	If yes: description of non-compliant features	n/a	n/a

7 Macroprudential supervisory measures

7.1 CCyB1: Geographical distribution of credit exposures used in the countercyclical capital buffer

31.12.2021 in CHF million (unless stated otherwise)	a	c	d	e
Country	Countercyclical capital buffer rate (in %)	Risk-weighted assets (RWA) in the computation of the extended counter-cyclical capital buffer	Bank-specific countercyclical capital buffer rate (in %)	Countercyclical buffer amount
Hong Kong	1.00%	6		
Luxembourg	0.50%	867		
Subtotal	–	**873**		
Other countries		54,655		
Total RWA of credit exposures used in the countercyclical capital buffer [1]		**55,528**		
Total RWA [2]		**71,553**	**0.01%**	**6**

[1] The total equals the sum of RWA for Zürcher Kantonalbank's relevant private sector credit exposures, including countries without a countercyclical buffer rate and countries with a countercyclical buffer rate of 0.00%.

[2] For the calculation of the countercyclical buffer amount, the total RWA of Zürcher Kantonalbank are relevant.

The extended countercyclical buffer (eCCB) under Art. 44a CAO applies to Zürcher Kantonalbank for the first time as at 31 December 2021. Therefore, table CCyB1 was created and published for the first time as at 31 December 2021. As a result, there are no prior-period comparison figures.

8 Leverage Ratio

8.1 LR1: Leverage ratio: summary comparison of accounting assets vs. leverage ratio exposure measure

31.12.2021 in CHF million		a
1	Total assets as per published financial statements	192,105
1a	Differences between published financial statements and accounting principles used for the determination of the leverage ratio exposure [1]	–
2	Adjustment for investments in banking, financial, insurance or commercial entities that are consolidated for accounting purposes but outside the scope of regulatory consolidation (margin nos. 6 – 7 FINMA Circ. 15/3), as well as adjustment for assets deducted from Tier 1 capital (margin nos. 16 – 17 FINMA Circ. 15/3)	-56
3	Adjustment for fiduciary assets recognised on the balance sheet for accounting purposes, but excluded from the leverage ratio exposure measure (margin no. 15 FINMA Circ. 15/3)	–
4	Adjustment for derivative financial instruments (margin nos. 21 – 51 FINMA Circ. 15/3)	7,887
5	Adjustment for securities financing transactions (SFTs) (margin nos. 52 – 73 FINMA Circ. 15/3)	1,890
6	Adjustment for off-balance-sheet items (i.e. conversion to credit equivalent amounts) (margin nos. 74 – 76 FINMA Circ. 15/3)	10,598
7	Other adjustments	–
8	**Leverage ratio exposure (sum of Rows 1 – 7)**	**212,425**

[1] Not applicable to Zürcher Kantonalbank, as it does not use an international accounting standard.

8.2 LR2: Leverage ratio: leverage ratio common disclosure template

		a	b
in CHF million		**31.12.2021**	**30.06.2021**
On-balance-sheet exposures			
1	On-balance sheet items (excluding derivatives and SFTs, but including collateral) (margin nos. 14 – 15 FINMA Circ. 15/3)	164,545	161,110
2	Assets that must be deducted in determining the eligible Tier 1 capital (margin nos. 7 and 16 – 17 FINMA Circ. 15/3)	-56	-74
3	**Total on-balance sheet exposures within the leverage ratio framework, excluding derivatives and SFTs (sum of rows 1 and 2)**	**164,488**	**161,035**
Derivatives			
4	Replacement values associated with all derivatives transactions, including those with CCPs, taking into account the margin payments received and netting agreements in accordance with margin nos. 22 – 23 and 34 – 35 FINMA Circ. 15/3	2,255	3,091
5	Add-on amounts for PFE associated with all derivatives transactions (margin nos. 22 and 25 FINMA Circ. 15/3)	7,469	7,827
6	Gross up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the operative accounting framework (margin no. 27 FINMA Circ. 15/3)	1,962	1,716
7	Deduction of receivables assets for cash variation margin provided in derivatives transactions, in accordance with margin no. 36 FINMA Circ. 15/3	-2,022	-1,755
8	Deduction relating to exposures to QCCPs if there is no obligation to reimburse the client in the event of the QCCP defaulting (margin no. 39 FINMA Circ. 15/3	-582	-572
9	Adjusted effective notional amount of written credit derivatives, after deduction of negative replacement values (margin no. 43 FINMA Circ. 15/3)	309	117
10	Adjusted effective notional offsets of bought / written credit derivatives (margin nos. 44 – 50 FINMA Circ. 15/3) and add-on deductions for written credit derivatives (margin no. 51 FINMA Circ. 15/3)	-234	-113
11	**Total derivative exposures (sum of rows 4 – 10)**	**9,159**	**10,311**
Securities financing transaction exposures			
12	Gross SFT assets with no recognition of netting (except in the case of novation with a QCCP as per margin no. 57 FINMA Circ. 15/3) including sale accounting transactions (margin no. 69 FINMA Circ. 15/3), less the items specified in margin no. 58 FINMA Circ. 15/3)	26,289	28,010
13	Netted amounts of cash payables and cash receivables relating to SFT counterparties (margin nos. 59 – 62 FINMA Circ. 15/3)	–	–
14	CCR exposure for SFT assets (margin nos. 63 – 68 FINMA Circ. 15/3)	1,890	1,956
15	Agent transaction exposures (margin nos. 70 – 73 FINMA Circ. 15/3)	–	–
16	**Total securities financing transaction exposures (sum of rows 12 – 15)**	**28,179**	**29,966**
Other off-balance-sheet exposures			
17	Off-balance-sheet exposure at gross notional amounts before application of credit conversion factors	41,773	40,078
18	Adjustments for conversion to credit equivalent amounts (margin nos. 75 – 76 FINMA Circ. 15/3)	-31,175	-30,256
19	**Total off-balance-sheet items (sum of rows 17 and 18)**	**10,598**	**9,822**
Eligible capital and total exposures			
20	Tier 1 capital (margin no. 5 FINMA Circ. 15/3)	13,253	12,722
21	Total exposures (sum of rows 3, 11, 16 and 19)	212,425	211,135
Leverage ratio			
22	**Leverage ratio (margin nos. 3 – 4 FINMA Circ. 15/3) in %**	**6.2%**	**6.0%**

The balance sheet items in row 1 of Table LR2 are equal to total assets as reported less amounts due from securities transactions and the positive replacement value of derivative financial instruments.

Compared to 30 June 2021, total on-balance-sheet exposures (excluding derivatives and securities financing transactions) rose by CHF 3,453 million for volume reasons. The exposures from derivatives (CHF - 1,152 million) and securities financing transactions (CHF - 1,787 million) both moved in the opposite direction. The change in off-balance-sheet items (CHF + 776 million) was smaller. The increase in Tier 1 capital exceeded the effect of the slightly higher total exposure in the calculation of the leverage ratio, resulting in a higher leverage ratio as at 31 December 2021 (6.2 percent) compared to 30 June 2021 (6.0 percent).

9 Liquidity

9.1 LIQA: Liquidity: liquidity risk management

Qualitative disclosures

Strategy

The aim of liquidity risk management is to ensure solvency, even under bank-specific or market-specific stress conditions. Zürcher Kantonalbank pursues a long-term refinancing policy that includes both cost and risk aspects.

Refinancing risks are managed via diversification in terms of maturities, refinancing instruments used and related markets. This diversification limits dependence on funding sources. For this purpose, Treasury uses both short- and long-term instruments, which are placed on the domestic and international markets. The diversified refinancing base is reflected in a broad product portfolio, comprising client deposits, bank deposits and money and capital market refinancing. In addition, the regulatory net stable funding ratio (NSFR) is used to measure, manage and control structural liquidity.

Organisation and processes

The Treasury organisational unit, which reports to the CFO, is responsible for managing the liquidity risks and refinancing of Zürcher Kantonalbank. Treasury delegates operational liquidity management to the Money Trading unit, which ensures the efficient use of liquidity based on internal and regulatory rules. In line with the requirements of the bank's risk policy, the Board of Directors defines the liquidity risk tolerance. The risk organisation oversees compliance with the rules and reports to the Board of Directors in this regard on a regular basis.

The measurement, management and control of short-term liquidity risks are based on both an internal model and on the liquidity coverage ratio (LCR), a regulatory liquidity indicator. The internal model is based on a bank-specific stress scenario for balance-sheet and off-balance-sheet transactions. In this scenario, substantial outflows of varying intensity in the client and interbank business are assumed, among other things. The result of the liquidity risk measurement is an automatically produced daily report on the availability of liquid assets and unencumbered high-quality liquid assets (HQLA) in financial investments and trading positions, liquidity inflows and outflows under the stress scenario, and the liquidity position left after the stress scenario. The emergency plan also constitutes a significant element of liquidity risk management. This supports the situationally appropriate conduct of the relevant functions in a crisis.

When calculating the regulatory LCR, the bank uses an internal model to divide wholesale deposits into operational and non-operational categories. Net outflows of funds from the collateralisation of derivatives due to changes in market values are calculated using the look-back method. Besides Swiss francs, which make up by far the largest part of the balance sheet of Zürcher Kantonalbank, the LCR is also monitored and periodically reported in other major currencies.

Quantitative disclosures

The following table shows inflows and outflows in items on and off balance sheet with a fixed term by maturity band in the group and compares these to holdings of high-quality liquid assets (HQLA) as at 31 December 2021. Unlike the data used to calculate the liquidity cover ratio (LCR), this table also includes unweighted inflows and outflows beyond 30 days. Business with no set maturity, such as savings deposits and sight deposits, are not included.

31.12.2021

in CHF million						M = month(s), Y = year
Outflows		**≤ 1M**	**> 1M ≤ 3M**	**> 3M ≤ 6M**	**> 6M ≤ 1Y**	**> 1Y**	**Total**
Outflow from own bonds issued		1,203	5,402	8,693	2,205	18,998	36,501
Outflow from unsecured financing		15,692	16,329	5,804	1,133	2,421	41,379
Outflow from securities financing transactions / secured financing		2,188	–	–	–	620	2,808
Additional outflows [1]		10,103	3,296	2,466	4,359	8,265	28,490
Total outflows		**29,186**	**25,027**	**16,964**	**7,697**	**30,305**	**109,178**
Inflows		**≤ 1M**	**> 1M ≤ 3M**	**> 3M ≤ 6M**	**> 6M ≤ 1Y**	**> 1Y**	**Total**
Inflow from lending		6,698	6,539	4,838	6,725	69,111	93,912
Inflow from securities financing transactions		16,833	981	2,206	1,861	3,553	25,434
Additional inflows [2]		9,401	3,239	2,179	3,588	6,321	24,727
Total inflows		**32,933**	**10,758**	**9,222**	**12,175**	**78,985**	**144,073**
HQLA	**Inventory**	**≤ 1M**	**> 1M ≤ 3M**	**> 3M ≤ 6M**	**> 6M ≤ 1Y**	**> 1Y**	
HQLA after netting of outflows and inflows	**51,554**	**55,300**	**41,032**	**33,290**	**37,768**	**86,449**	

[1] Outflows from irrevocable lending commitments and derivatives

[2] Inflows from trading securities and derivatives

Risk profile

As a systemically important bank, Zürcher Kantonalbank has had to fulfil significantly higher regulatory liquidity requirements since 1 January 2021. The average LCR, which is calculated as a simple average of the end-of-day values of the business days during the quarter under review, lies between 147 percent and 160 percent. High-quality liquid assets (HQLA) average between CHF 50.5 billion and CHF 60.2 billion. The HQLA consist of Level-1 assets (cash, central bank deposits, tradeable securities from countries and central banks with high credit ratings) and Level-2 assets (tradeable securities with less strict criteria). The majority of Level-1 assets are held in the form of central bank deposits. Zürcher Kantonalbank actively manages its liquidity risk profile, particularly through targeted management of time deposits, money-market instruments as well as SLB and repo transactions. The changes in the LCR and the internal statistical measures of liquidity risk are mainly driven by portfolio changes in non-operational sight deposits, time deposits, money-market instruments, as well as SLB and repo transactions with banks and major clients.

9.2 LIQ1: Liquidity: Liquidity coverage ratio (LCR)

		Quarterly averages Q3 21 [1]		Quarterly averages Q4 21 [1]	
	in CHF million	Unweighted values	Weighted values	Unweighted values	Weighted values
A. High-quality liquid assets (HQLA)					
1	**Total high quality liquid assets (HQLA)**		**50,503**		**51,682**
B. Cash outflows					
2	Retail deposits	62,242	6,381	62,719	6,440
3	of which stable deposits	5,991	300	5,994	300
4	of which less stable deposits	56,252	6,082	56,725	6,140
5	Unsecured wholesale funding	42,474	25,109	43,661	25,327
6	of which operational deposits (all counterparties) and deposits in networks of cooperative banks	4,969	1,242	5,128	1,282
7	of which non-operational deposits (all counterparties)	35,536	21,898	37,319	22,832
8	of which unsecured debt	1,970	1,970	1,214	1,214
9	Secured wholesale funding and collateral swaps		5,630		6,930
10	Other outflows	20,513	8,658	20,399	8,900
11	of which outflows related to derivative exposures and other transactions	10,996	6,859	11,288	7,232
12	of which outflows related to loss of funding on asset-backed securities, covered bonds and other structured financing instruments, asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities	48	48	79	79
13	of which, outflows related to committed credit and liquidity facilities	9,469	1,750	9,032	1,588
14	Other contractual funding obligations	2,455	2,421	2,486	2,454
15	Other contingent funding obligations	36,436	372	38,944	403
16	**Total cash outflows**		**48,572**		**50,453**
C. Cash inflows					
17	Secured financing operations (e.g. reverse repo transactions)	11,772	9,210	14,060	10,995
18	Inflows from fully performing exposures	1,337	991	1,667	1,307
19	Other cash inflows	6,463	6,463	5,908	5,908
20	**Total cash inflows**	**19,571**	**16,663**	**21,636**	**18,211**
Adjusted values					
21	**Total high-quality liquid assets (HQLA)**		**50,503**		**51,682**
22	**Total net cash outflows**		**31,908**		**32,242**
23	**Liquidity coverage ratio in %**		**158%**		**160%**

[1] The average is calculated based on the end of day values from the business days of the reported quarter: Q3 21: 66 days included, Q4 21: 66 days included.

As a systemically important bank, Zürcher Kantonalbank is subject to stricter liquidity requirements: it has to meet a higher liquidity coverage ratio (LCR) than non-systemically important banks. Zürcher Kantonalbank's ongoing comfortable liquidity situation is reflected in the LCR. On a group basis, the LCR increased from the previous quarter and stood at an average of 160 percent in the fourth quarter of 2021 (third quarter of 2021: 158 percent).

9.3 LIQ2: Liquidity: Net stable funding ratio (NSFR)

31.12.2021		a	b	c	d	e
		Unweighted value by residual maturity				Weighted value
in CHF million		No maturity	< 6 months	≥ 6 months to < 1 year	≥ 1 year	
	Available Stable Funding (ASF) item					
1	Capital	–	–	–	13,603	13,603
2	Regulatory capital	–	–	–	13,603	13,603
3	Other capital instruments	–	–	–	–	–
4	Retail deposits and deposits from small business customers	63,331	228	12	97	57,613
5	Stable deposits	5,998	18	3	4	5,723
6	Less stable deposits	57,333	210	9	93	51,890
7	Wholesale funding	27,049	28,408	1,035	1,593	16,937
8	Operational deposits	5,243	–	–	–	2,621
9	Other wholesale funding	21,807	28,408	1,035	1,593	14,315
10	Liabilities with matching interdependent assets	1,298	–	–	–	–
11	Other liabilities	10,506	23,273	1,995	18,438	20,065
12	NSFR derivative liabilities		–	–	–	
13	All other liabilities and equity not included in the above categories	10,506	23,273	1,995	18,438	20,065
14	**Total Available Stable Funding (ASF)**					**108,217**
	Required Stable Funding (RSF) item					
15	Total NSFR high-quality liquid assets (HQLA)					1,414
16	Deposits held at other financial institutions for operational purposes	318	–	–	–	159
17	Performing loans and securities	27,522	31,941	7,827	70,061	83,853
18	Performing loans to financial institutions secured by level 1 and 2a HQLA	2,078	5,809	–	–	1,003
19	Performing loans to financial institutions secured by non-level 1 and 2a HQLA and unsecured performing loans to financial institutions	8,073	10,780	747	1,616	8,758
20	Performing loans to non-financial corporate clients, loans to retail and small business customers, and loans to sovereigns, central banks and public sector entities, of which	7,375	7,079	1,386	9,785	18,056
21	with a risk weight of less than or equal to 35% under SA-BIS	38	–	–	419	316
22	Performing residential mortgages, of which	7,362	7,927	5,143	56,249	52,437
23	with a risk weight of less than or equal to 35% under SA-BIS	7,233	7,852	5,081	55,123	51,301
24	Securities that are not in default and do not qualify as HQLA, including exchange-traded equities	2,633	346	552	2,411	4,736
25	Assets with matching interdependent liabilities	1,298	–	–	–	–
26	Other assets	4,144	7	197	1,806	5,326
27	Physical traded commodities, including gold	2,232				1,897
28	Assets posted as initial margin for derivative contracts and contributions to default funds of CCPs		–	190	1,045	1,050
29	NSFR derivative assets		–	–	137	137
30	NSFR derivative liabilities before deduction of variation margin posted		–	–	605	605
31	All other assets not included in the above categories	1,912	7	7	19	1,636
32	Off-balance sheet items		32,650	1,436	7,796	734
33	**Total Required Stable Funding (RSF)**					**91,486**
34	**Net Stable Funding Ratio (NSFR) (%)**					**118%**

As at mid-2021, the new provisions on the net stable funding ratio (NSFR) from the revised Liquidity Ordinance came into force. Zürcher Kantonalbank has fulfilled this new requirement of 100 percent with a significant buffer for some time. The quarter-end NSFR values ranged from 118 percent to 120 percent in the second half of 2021.

Under the transitional provisions in FINMA Circular 2016/1 "Disclosure – Banks", the disclosure of data at the end of the quarter in table LIQ2 as at 31 December 2021 is sufficient. Data for the previous quarter end and the one before that must be published for the first time as at 30 June 2022.

10 Credit risk

10.1 CRA: Credit risk: general qualitative information about credit risk

The strategy applied in the management of credit risks is set out in the internal lending policy. The strategy is revised and updated by the risk organisation as part of an annual, structured process and is approved by the Executive Board. The principles defined in the lending policy include the measurement and management of risks based on uniform, binding objectives and instruments, and the acceptance of risks based on objective, business-related criteria, in proportion to the bank's risk capacity, together with sustainable management of the quality of the credit portfolio.

The bank adopts a risk and cost-based pricing policy, with transparent credit decisions and a selective, quality-oriented strategy for the acquisition of financing business. Particular attention is paid to environmental and social risks in the credit assessment process. In recognition of the total commitment of owners, higher risks may deliberately be accepted on occasion for SMEs from the Greater Zurich Area.

Organisation and processes

The risk managers bear responsibility for profits and losses generated on the risks entered into. They are responsible for the continuous, active management of risks and for compliance with internal risk tolerance regulations, relevant laws, ordinances, circulars and standards. The sales units in Corporate Clients, Institutionals & Multinationals, Private Banking and the support centre in Products, Services & Direct Banking are the risk managers responsible for credit risks.

The preventative risk management and risk control functions are separated from risk management at Executive Board level. Preventative risk management issues lending guidelines, analyses and reviews transactions in line with existing delineations of power, monitors business-related risks on an ongoing basis and assists in the training of risk managers. Risk control monitors and reports at portfolio level and is responsible for defining risk measurement methods.

The Compliance function is a member of the Risk Committee of the Executive Board and also the Credit Committee, which considers in advance credit risk-related issues which fall within the remit of the Risk Committee.

Audit supports the Board of Directors in fulfilling its statutory supervisory and control tasks and discharges the monitoring tasks assigned to it by the Board of Directors. In particular, Audit independently and objectively evaluates the appropriateness and effectiveness of the internal control and risk management processes and contributes towards their improvement. Audit also checks the bank's compliance with regulatory provisions, internal directives and guidelines. Audit has unlimited rights of inspection, information and access within the entire group.

Credit risks are managed and limited by means of detailed parameters and areas of responsibility within the credit process at individual exposure level and by means of limiting the risk capital in accordance with the capital at risk approach at portfolio level. Another key control element in credit risk management is risk-adjusted pricing, which includes expected losses (standard risk costs) as well as the cost of the risk capital to be retained in order to cover unexpected losses.

Expected losses are determined on the basis of the statistical probability of default (PD), assumptions regarding the level of exposure at default (EAD) and the estimated loss given default (LGD). Rating models specific to individual segments are used to determine default probabilities. The rating system for retail and corporate clients as well as banks combines statistical procedures with many years of practical experience in the lending business and incorporates both qualitative and quantitative elements. Country ratings are in principle based on the ratings of external agencies (country ceiling ratings and sovereign default ratings).

A credit portfolio model is used as the basis for the modelling of unexpected losses. Besides default probabilities, exposures in the event of default and loss rates, correlations between debtors are particularly significant for the modelling of unexpected losses. The model covers balance-sheet and off-balance-sheet items.

Collateral

The valuation of collateral for loans, and in particular the calculation of market and collateral values, is governed by an extensive set of internal rules setting out the relevant methods, procedures and responsibilities. These rules are continually reviewed and aligned with regulatory requirements and market changes. For the valuation of mortgage collateral, the bank uses recognised estimation methods that are tailored to the type of property, including hedonic models, income capitalisation approaches and expert appraisals, among others.

The models used as well as the individual valuations are reviewed on a regular basis. The maximum loan-to-value ratio for mortgages depends on how realisable the collateral is and is influenced by factors such as location and type of property (family home or commercial property, for example). Readily marketable collateral (securities, precious metals, account balances, for example) is generally valued at current market prices. The lending of readily marketable collateral is subject to the deduction of specified margins. These margins differ primarily in terms of the collateral's susceptibility to fluctuations in value.

Limiting and monitoring credit exposures

Credit exposures are restricted by limits. In addition to the limits at counterparty and counterparty group level, limits are placed on sub-portfolios, for instance for foreign exposures. All credit and contingent exposures are monitored on a daily basis, and exposures from trading transactions are monitored on a real-time basis. In the case of trading transactions, pre-deal checks can be undertaken to examine and ensure adherence to counterparty limits. Any breaches of limits are reported promptly to the competent management level. An early-warning system identifies negative developments, which are communicated to the officers responsible. The rating of corporate clients is generally reviewed once a year on the basis of the annual financial statements. A supplementary review of ratings, limits and exposures in the retail and corporate client business is undertaken using risk-oriented criteria. Ratings, limits and exposures in the banking sector are reviewed periodically and on an extraordinary basis in the event of a deterioration in the credit rating of a particular institution.

Value adjustments

As part of their risk management role, the bank's relationship managers constantly monitor all positions in the credit portfolio to identify any signs of impairment of value. Should any signs be found, a standardised impairment test is used to determine whether a loan should be classed as impaired. Impaired loans are those where the borrower is unlikely to be able to meet his future obligations.

Where it appears that the bank will be unable to collect all amounts due on a claim, the bank makes an allowance for the unsecured part of the loan, taking into account the borrower's creditworthiness. In determining the required value adjustment, mortgage collateral (including valuation discounts, settlement and holding costs) and readily marketable collateral (freely tradeable securities as well as other easily realised assets such as deposits, precious metals, fiduciary investments, etc.) are considered at their current liquidation value. The recoverability of other collateral (e. g. leased assets, guarantees) has to be demonstrated in particular. The authority to approve the creation of new individual value adjustments rests with the risk managers. Above a certain amount, the approval of the risk organisation is also required.

Interest and associated commission payments that have not been received in full 90 days after becoming due are classified as past due. They are deemed to be impaired and are usually fully adjusted if they are not covered by collateral. Individual value adjustment rates may apply to the principal in the case of major positions. Collective individual value adjustments are recognised for overdrafts of up to CHF 30,000 and for interest and associated commission payments outstanding for more than 90 days; in all other cases, individual value adjustments are generally set aside.

In principle, a central, specialised unit fundamentally manages impaired positions across all client segments. This unit steers the positions through the stabilisation and resolution process and ensures that existing value adjustments are regularly reviewed and adjusted where necessary.

Value adjustments and provisions for expected losses

For non-impaired loans / receivables and off-balance-sheet transactions, Zürcher Kantonalbank recognises value adjustments and provisions for expected losses. Expected loss (EL) is the anticipated value of future losses from credit defaults. The EL is determined on the non-impaired loans / receivables of the following balance sheet and off-balance-sheet items:

- Amounts due from banks
- Amounts due from customers
- Mortgage loans
- Debt instruments held to maturity in financial investments
- Contingent liabilities
- Irrevocable commitments

Country risks

The country risk of individual exposures is determined on the basis of the risk domicile, where this is not identical to the domicile of the borrower, in accordance with the Swiss Bankers Association's guidelines on the management of country risk. In the case of secured exposures, the domicile of the collateral is taken into account when determining the risk domicile. The risks for each country, total country risks and total country risks outside the bank's best internal rating category are subject to limits, adherence to which is monitored on a constant basis.

Settlement risks

A settlement risk arises in the case of transactions with mutual payment and delivery obligations where Zürcher Kantonalbank must meet its obligations without being able to ensure that counter-payment is also being made. Settlement risk can occur in relation to foreign exchange transactions, securities lending and borrowing (SLB) and OTC repo transactions as well as transactions involving different payment systems and time zones in the interbank sector. Zürcher Kantonalbank is a member of the CLS Bank International Ltd. joint venture, a clearing centre for the settlement of foreign exchange transactions on a "payment versus payment" basis, which helps ensure that a substantial element of the settlement risk arising as a result of foreign exchange trading is eliminated.

Concentration risks

Zürcher Kantonalbank uses a systems-based method for monitoring concentration risks. Besides measurement for the purpose of preparing regulatory reports, concentration risks are limited at product and client level using benchmarks that are reflected in the corresponding powers of authorisation. Internal concentration risk reporting includes information on product, sector and individual position concentrations. Due to the bank's roots within the Greater Zurich Area, a large concentration risk in the credit portfolio takes the form of geographical concentration risk in the mortgage portfolio.

Reporting

The CRO report is a quarterly report from the risk organisation, produced independently of the risk managers, informing the Executive Board and Board of Directors of events, the risk profile and credit risk monitoring. Information on the credit risk profile of the group is provided in tables, graphs and commentaries on trends in the individual subportfolios and credit risk overall. In addition to management reporting, there are also special reports on selected issues of special relevance and / or topicality. These reports are also seen by FINMA and the external auditor. In addition, every year, the Executive Board and Board of Directors receive reports on the suitability and effectiveness of internal controls in credit risk management. When special developments or events occur, the Executive Board and Board of Directors are informed on an ad hoc basis of changes in the risk profile in additional reports and analyses.

Apart from the management reporting, there are also various monitoring reports. These support risk monitoring in the Risk unit and management controls in the organisational units managing risk. Unlike the management reporting, the monitoring reports focus on a limited presentation of specific risks or portfolios, in some cases all the way down to counterparty level. Depending on their subject, these monitoring reports are produced at shorter intervals, as production is often more automated than for the management reporting described above.

Risk profile

Zürcher Kantonalbank pursues a full-service banking strategy. This is directly derived from the Law on Zürcher Kantonalbank and the needs of the people and businesses in the Greater Zurich Area. In line with this strategic focus, the bank operates a broadly diversified business model strongly rooted in the Greater Zurich Area. In accordance with the business model the lending business, and especially the mortgage lending business, are central business areas for the bank. Mortgage receivables amount to CHF 91.8 billion making them by far the largest item in the receivables on the balance sheet. Around two-thirds of mortgage loans relate to owner-occupied residential property. The remaining loans are secured with rented residential properties or properties that are used for commercial purposes. This is reflected in the bank's risk profile. Loan commitments are shown in table CR4 (SA-BIS) starting from page 53 and CR6 (IRB) starting from page 57 by exposure category under Basel III.

Investment portfolio

Strategy, organisation and processes for the management of risks in the investment portfolio

The risks in the investment portfolio comprise issuer risks on debt and equity securities in financial investments. Because these are allocated to the banking book, they are included under credit risk for capital adequacy purposes. Real estate price risk also comes under risks in the investment portfolio. According to the capital adequacy rules, these are non-counterparty related risks. They are disclosed under credit risk; please see table LI1 on page 28. Interest rate risks are managed and limited as part of asset and liability management.

The basis of the investment portfolio is mainly operational. Debt securities in financial investments form part of the bank's liquidity buffer, and participations mainly related to companies within the financial market infrastructure. In addition, Zürcher Kantonalbank provides start-up financing to promote young companies. The real estate position consists almost entirely of property in use by the bank.

The purchase of financial investments and real estate as well as the acquisition of participations are subject to detailed regulations and responsibilities. The investment strategy for the financial investments managed by Treasury is laid down in the risk tolerance requirements approved by the Risk Committee of the Executive Board. Only debt instruments with a first-class credit rating that are considered high-quality liquid assets (HQLA) may be purchased. In 2021, the bank updated its investment guidelines by including requirements on climate-related financial risks in order to align to Zürcher Kantonalbank's sustainability policy. Financial investments by Treasury must now meet not only exclusion criteria for issuers from critical industries, but also requirements regarding their carbon footprint (CO_2 emissions relative to sales). The Risk unit is responsible for the measurement and monitoring of risk as well as independent reporting on investment portfolio risks.

Risks relating to the investment portfolio are managed internally by assigning risk capital. For the determination of this risk capital for financial investments and participations, Zürcher Kantonalbank uses an internal default model that takes diversification effects into account. For real estate owned by the bank, risk capital is allocated based on regulatory minimum capital adequacy requirements.

Risk profile

The carrying amount of debt securities in financial investments was CHF 4,477 million as at 31 December 2021 (2020: CHF 4,699 million). The portfolio consists of mortgage bonds and first-class bonds, which are diversified in terms of counterparty groups and countries. Some debt instruments from banks have guarantees from central government. For risk mitigation techniques, please see table CR3 on page 52.

10.2 CR1: Credit risk: credit quality of assets

31.12.2021 in CHF million		a Gross carrying values of defaulted exposures	b Gross carrying values of non-defaulted exposures	c Value adjustments / impairments [1]	d Net values (a + b - c)
1	Loans (excluding debt securities) [2]	517	104,337	625	104,228
2	Debt securities [2]	–	4,478	1	4,477
3	Off-balance-sheet exposures	164	14,734	–	14,898
4	**Total**	**681**	**123,548**	**626**	**123,602**

[1] Zürcher Kantonalbank adopted the rules on value adjustments and provisions for expected losses (VA and P for EL) on 01.01.2021. VA and P for EL are recognised in non-defaulted exposures. Consequently, VA for EL are included in column c of this table, so column d shows the net figures according to the accounting rules. This also means that value adjustments / impairments as at 31.12.2021 are higher than the gross carrying values of defaulted exposures.

[2] According to FINMA Circ. 16/1, on-balance-sheet items include loans and debt securities. Hence, liquid assets, trading portfolio assets, equities, accrued income and prepaid expenses and non-counterparty-related risks in the amount of CHF 42,514 million are not included in this table.

Disclosure and explanation of internal definition of default

Defaulted loans/receivables

This is a regulatory definition. Under the standardised approach, defaulted loans include both impaired loans and non-performing loans, e. g. those more than 90 days in arrears. Under IRB, a model approach has been selected that uses the rating assigned to define "defaulted". If a counterparty is assigned the default rating (C19) under such definition, all receivables from that counterparty are deemed to be in default, regardless of whether they are covered by collateral or not.

Impaired loans/receivables

Accounting definition: For accounting purposes, loans are impaired when the borrower is unlikely to be able to meet future obligations and they are not covered by collateral. The assessment as to whether a loan is impaired is made on an individual basis.

Non-performing loans/receivables

For both accounting and supervisory purposes, loans are classified as non-performing when interest, commission or amortisation payments or the repayment of the principal have not been received in full 90 days after becoming due. This also includes claims against borrowers in liquidation, and loans with special conditions arising from the borrower's financial standing. Non-performing loans are also often a component of impaired loans.

10.3 CR2: Credit risk: changes in stock of defaulted loans and debt securities

31.12.2021 in CHF million		a
1	**Defaulted loans and debt securities [1] at end of the previous reporting period (30.06.2021)**	**557**
2	Loans and debt securities that have defaulted since the last reporting period	56
3	Returned to non-defaulted status	58
4	Amounts written off	6
5	Other changes (+/-) [2]	-33
6	**Defaulted loans and debt securities at end of the reporting period (1 + 2 - 3 - 4 + 5)**	**517**

[1] All exposures are presented gross of value adjustments for default risks.

[2] Mainly volume changes of loans and debt securities, which had the status "defaulted" at the end of both reporting periods.

During the reporting period, there were no material changes to the portfolios of defaulted loans and debt securities. The total for defaulted loans and debt securities as at 31 December 2021 decreased by CHF 40 million compared to the figure recorded on 30 June 2021.

10.4 CRB: Credit risk: additional disclosure related to the credit quality of assets

Breakdown of exposures by geographical area

31.12.2021

in CHF million	Carrying values
Switzerland	103,058
Rest of Europe	3,092
Americas	1,122
Asia and Oceania	1,410
Africa	22
Total exposures	**108,705**

Breakdown of exposures by industry

31.12.2021

in CHF million	Carrying values
Agriculture	637
Manufacturing	3,921
Services	41,591
Individuals and other	62,556
Total exposures	**108,705**

Breakdown of exposures by residual maturity

31.12.2021

in CHF million	Carrying values
Due up to 3 months	16,806
Due between 3 and 12 months	20,202
Due between 1 and 3 years	21,741
Due between 3 and 5 years	18,042
Due after more than 5 years	31,913
Total exposures	**108,705**

Impaired loans/receivables

Accounting definition: For accounting purposes, loans are impaired when the borrower is unlikely to be able to meet future obligations and they are not covered by collateral. The assessment as to whether a loan is impaired is made on an individual basis.

Impaired loans amounted to CHF 418 million (2020: CHF 500 million). After deducting the estimated liquidation value of collateral, this equals net debt of CHF 207 million (2020: CHF 254 million).

Identification of impaired loans

Please refer to the section headed "Value adjustments" in table CRA starting from page 46.

Breakdown of impaired exposures by geographical area

31.12.2021 in CHF million	Impaired exposures (gross debt)	Allowances and write-offs
Switzerland	358	152
Rest of Europe	58	36
Americas	2	2
Asia and Oceania	–	–
Africa	–	–
Total impaired exposures	**418**	**190**

Breakdown of impaired exposures by industry

31.12.2021 in CHF million	Impaired exposures (gross debt)	Allowances and write-offs
Agriculture	8	4
Manufacturing	102	46
Services	218	118
Individuals and other	89	22
Total impaired exposures	**418**	**190**

Non-performing loans/receivables

For both accounting and supervisory purposes, loans are classified as non-performing when interest, commission or amortisation payments or the repayment of the principal have not been received in full 90 days after becoming due. This also includes claims against borrowers in liquidation, and loans with special conditions arising from the borrower's financial standing. Non-performing loans are also often a component of impaired loans. The nominal value of non-performing loans amounted to CHF 89 million at the end of the reporting period (2020: CHF 103 million). Loans that were non-performing but not impaired amounted to CHF 39 million (2020: CHF 42 million). These are loans covered by collateral.

Ageing analysis of accounting past-due exposures

31.12.2021 in CHF million	Past-due exposures (gross debt)	Allowances and write-offs
Past-due for up to 3 months	18	4
Past-due for 3 to 6 months	11	3
Past-due for 6 to 9 months	11	2
Past-due for 9 months to 1 year	14	8
Past-due for 1 to 3 years	24	6
Past-due for 3 to 5 years	5	3
Past-due for more than 5 years	6	3
Total past-due exposures	**89**	**29**

Restructured exposures

Restructured exposures are all those on- or off-balance-sheet positions which are deemed in default and are being serviced by a dedicated team within the bank. Individual value adjustments or provisions are recognised for impaired default positions and off-balance-sheet positions with credit risk. Positions that have recovered are no longer flagged as being in default, but are generally only transferred from the dedicated team back to sales, once a degree of sustainability has been confirmed. Positions in sales do not count as restructured.

Breakdown of restructured exposures

31.12.2021	Gross debt		
in CHF million	Impaired	Not impaired	Total
Restructured exposures	**175**	**182**	**357**

Defaulted loans/receivables

This is a regulatory definition. Under the standardised approach, defaulted loans include both impaired loans and non-performing loans, e. g. those more than 90 days in arrears. Under IRB, a model approach has been selected that uses the rating assigned to define "defaulted". If a counterparty is assigned the default rating (C19) under such definition, all receivables from that counterparty are deemed to be in default, regardless of whether they are covered by collateral or not.

10.5 CRC: Credit risk: qualitative disclosure requirements related to credit risk mitigation techniques

Core features of policies and processes for on- and off-balance-sheet netting

For accounting purposes, with the exception of the following instances, no netting takes place. Payables and receivables are offset if all the conditions below are met:

– payables and receivables arise from the same type of transactions with the same counterparty;

– have the same or earlier maturity for the receivable;
– are in the same currency and
– cannot result in a counterparty risk.

Holdings of own bonds and cash bonds are offset against the corresponding liability items. Furthermore, positive and negative value adjustments with no income effect are offset in the compensation account.

For over-the-counter transactions, the positive and negative replacement values of derivative instruments as well as the related cash collaterals are offset. For this purpose, a relevant bilateral agreement with the affected counterparties must be in place. This agreement must be proven to be recognised and legally enforceable.

Netting on the balance sheet as at 31 December 2021 amounted to CHF 10.9 billion (2020: CHF 12.6 billion). No off-balance-sheet netting takes place.

Core features of policies and processes for collateral evaluation and management

Bank guarantees are treated as other collateral. The loan-to-value ratio depends on the rating of the bank in question. Bank guarantees are checked by the sales unit for banks before acceptance. All other guarantees are classified simply as additional cover with no eligible collateral value (unsecured). Guarantees from other companies may only be taken into consideration where Risk Control has given its prior consent.

If the amount of a guarantee is a maximum including interest and other costs, it must be for at least 110 percent of the loan amount to be secured. The term of the credit exposure is measured in line with the maximum validity of the guarantee. The loan generally matures one month before the guarantee expires, so a claim can be made.

For the purposes of calculating capital adequacy, Zürcher Kantonalbank recognises bank guarantees (Zürcher Kantonalbank as direct beneficiary, callable on first request with no right of objection) using the substitution approach. State guarantees are also taken into account.

Information about market or credit risk concentrations under the credit risk mitigation instruments used (i. e. by guarantor type, collateral and credit derivative protection providers)

Guarantees taken into account for credit exposures are included in internal risk measurement under the guarantor's credit exposure. This means that the value of guarantees is included automatically in concentration risk monitoring at the level of client, region and sector.

10.6 CR3: Credit risk: credit risk mitigation techniques - overview

In order to ensure a consistent point of view without anticipating the IRB segmentation, the standardised approach was used to present the overview of credit risk mitigation techniques. We refer to the IRB tables in this report on page 57 onwards for IRB disclosures.

31.12.2021 in CHF million		a Unsecured exposures / carrying amount	b1 Secured exposures / carrying amount [1]	b of which secured by collateral [2]	d of which secured by financial guarantees [2]	f of which secured by credit derivatives [2]
1	Loans (excluding debt securities)	9,871	94,357	92,827	1,333	–
2	Debt securities	4,259	218	–	218	–
3	**Total**	**14,130**	**94,575**	**92,827**	**1,551**	**–**
4	of which defaulted	125	202	136	58	–

[1] Fully or partially secured by collateral (incl. secured by financial guarantees and credit derivatives)

[2] Secured amount. Where the amount the collateral / financial guarantee / credit derivate can be settled for exceeds the value of the exposure, the exposure amount is reported.

Unsecured exposures (excluding debt securities) increased by CHF 310 million compared to 30 June 2021, resulting in a proportion of fully or partially secured exposures (excluding debt securities) of 91 percent as at 31 December

2021. During the reporting period, there were no material changes in the extent to which credit risk mitigation techniques were used.

10.7 CRD: Credit risk: qualitative disclosures on banks' use of external credit ratings under the standardised approach for credit risk

Capital adequacy requirements for credit risks are calculated using the IRB approach. However, some positions are still calculated using the international standard approach (SA-BIS). With respect to these positions, the risk weights of counterparties may be calculated on the basis of agency ratings.

For the corporate and public-sector entity categories, Zürcher Kantonalbank applies the ratings from the agencies Standard & Poor's and Moody's. The ratings of export credit agencies (ECAs) are not taken into account.

For banks and governments, Fitch ratings are also taken into account. No ratings are used in the categories retail, equity securities and other positions. For securities, the issue-specific ratings from Standard & Poor's and Moody's are used.

If two or more ratings exist with different risk weights, those ratings which correspond to the two lowest risk weights are taken into consideration and the higher of the two risk weights is used. For debt securities, top priority is given to the issue rating and second priority to the issuer rating.

There were no changes in this regard during the period under review.

10.8 CR4: Credit risk: standardised approach - credit risk exposure and credit risk mitigation (CRM) effects

31.12.2021 in CHF million (unless stated otherwise)		a Exposures before CCF and CRM	b	c Exposures post-CCF and CRM	d	e	f
	Exposure class	On-balance-sheet amount	Off-balance-sheet amount	On-balance-sheet amount	Off-balance-sheet amount	RWA	RWA density
1	Central governments and central banks	295	–	1,372	2	0	0.0%
2	Banks and securities firms	293	187	288	91	87	23.0%
3	Other public sector entities and multilateral development banks	1,583	3,587	1,609	323	516	26.7%
4	Corporates	2,488	5,595	2,165	1,542	2,532	68.3%
5	Retail	3,628	2,123	2,611	243	2,267	79.4%
6	Equity	–	–	–	–	–	–
7	Other exposures [1]	42,167	443	42,141	88	1,307	3.1%
8	**Total**	**50,453**	**11,936**	**50,186**	**2,289**	**6,709**	**12.8%**

[1] According to FINMA Circ. 16/1, non-counterparty-related exposures are included in other exposures.

Compared to 30 June 2021, total on-balance-sheet exposures before CCF and CRM subject to credit risk under the standardised approach did not change materially (CHF + 123 million). Off-balance-sheet exposures also did not change significantly in the second half of 2021, rising by CHF 442 million. As the average risk weight (RWA density in %) fell over the year, total RWA were less than 30 June 2021 (CHF - 941 million), despite the small increase in balance-sheet and off-balance-sheet items.

10.9 CR5: Credit risk: standardised approach - exposures by asset classes and risk weights

31.12.2021 in CHF million		a	b	c	d	e	f	g	h	i	j
	Exposure class / risk weight	0%	10%	20%	35%	50%	75%	100%	150%	Other	Total credit exposures amount (post-CCF/post-CRM)
1	Central governments and central banks	1,374	–	–	–	–	–	0	–	–	1,374
2	Banks and securities firms	–	–	359	–	10	–	10	0	–	379
3	Other public sector entities and multilateral development banks	446	–	775	16	678	–	16	0	–	1,932
4	Corporates	–	–	829	86	911	6	1,875	1	–	3,707
5	Retail	–	–	–	810	–	259	1,775	9	–	2,854
6	Equity	–	–	–	–	–	–	–	–	–	–
7	Other exposures [1]	40,883	–	–	62	–	–	1,282	2	–	42,229
8	**Total**	**42,703**	**–**	**1,963**	**975**	**1,599**	**265**	**4,958**	**12**	**–**	**52,475**
9	of which, covered by mortgages	–	–	–	975	–	18	906	–	–	1,898
10	of which, past-due loans	–	–	–	–	–	–	18	12	–	30

[1] According to FINMA Circ. 16/1, non-counterparty-related exposures are included in other exposures.

The changes as at 31 December 2021 depicted in Table CR4 are also displayed in Table CR5 after CCF and CRM. Exposures with a risk weight of zero percent (generally cash and cash equivalents) increased by CHF 1,009 million, while those with a risk weight of 100 percent decreased by CHF 917 million. Otherwise, there were no significant changes in table CR5.

10.10 CRE: IRB: qualitative disclosures related to IRB models

In an order dated 8 January 2018, Zürcher Kantonalbank received permission from FINMA to use the IRB approach retrospectively from 31 December 2017 to calculate the capital adequacy requirement for credit risk. Model governance sets out the internal duties, competences and responsibilities within model management as follows:

Model development

The model owner has the technical responsibility for developing and refining the model. Care must be taken to ensure it is appropriate for the area of use and that suitable allowance is made for model uncertainties. The model owner has the technical responsibility for regular model suitability tests to monitor that the model is methodologically appropriate (e. g. back-testing). Model suitability tests are defined in terms of method and procedure as part of model development, and are carried out on a regular basis.

Model validation

Model validation acts as a supervisory body that is independent from the model owner, the manager of the specialist area and the model users. It ensures that models are appropriate and that material model uncertainties are taken into account.

New models undergo initial validation before going into operation. Models are revalidated in operation, either regularly or as required. The frequency is determined by model validation, taking into account regulatory requirements.

Reporting on model validation is provided in the internal quarterly report from the CRO and annually in the summary report of activities submitted by the Risk Control unit to the Executive Board and the Board of Directors.

Authorisation of model approvals and model changes

When a new model goes into operation or a model is changed, depending on the situation, the model validators must give approval and the competency holder within the bank must also issue their authorisation. It may also be necessary to then seek authorisation from or inform FINMA.

Internal control system and models

The heads of specialist areas are responsible for identifying models in their areas. The model owner also carries out a further management control of the effectiveness of model risk management. The Head of Risk Control monitors the effectiveness of the model risk management through model validation. For details of the role of Audit, please refer to the information presented under Table OVA on page 16.

Models

The rating models used for IRB purposes are:

Model name	Model type	Area of application
Bank rating model	Statistical rating model	The rating model for banks consists of two sequential sub-models. In a first step, the stand-alone model is used to categorise a bank according to its intrinsic financial strength. This involves determining a failure or stand-alone rating, which expresses the probability of the bank defaulting within a year. This takes no account of any potential external support from a banking group or government. Any rating improvement due to the willingness and ability of a banking group or government to provide support is only calculated in the second stage using the support model. When a support rating is calculated, this also takes the transfer and convertibility risk of the country of domicile into consideration. This may, however, lead to a lower rating. The end result is the final rating. Technically, the final stage is considered to form part of the support model. A shadow rating approach is used for the estimation and calibration of the standalone model, which takes agency ratings as target data. Replication is performed using a statistical regression model where the regression parameters for suitable influence factors are estimated (top-down approach). The support model, by contrast, is a mechanistic structural model that directly models the individual interactions (bottom-up approach).
Commercial rating model	Statistical rating model	The commercial rating model is used for loans to SMEs and key account customers. The model consists of various quantitative accounting variables such as profitability, debt and liquidity, and qualitative factors like management skills and stability.
Retail client rating model	Statistical rating model	The retail client rating model is used for retail real estate financing. It uses various factors such as disposable income, net loan to value and profession to calculate an overall score, which is presented as a probability of default (PD) via a calibration function.
Real estate rating model	Statistical rating model	The real estate rating model is used for clients with rental property loans. The model consists of various sub-models (with the option to select various factors and weights) for different client groups: – Real estate balance sheet model/module 1: Profit-oriented companies (based on balance sheet data) – Real estate balance sheet model/module 2: Non-profit-oriented companies (e. g. cooperatives, based on balance sheet data) – Real estate tax model/module 3: Natural persons (based on tax return) These models also consist of a quantitative part with factors such as the debt ratio and the cost/income ratio, and a qualitative part that considers issues such as real estate expertise and management stability.

As at 31 December 2018 Zürcher Kantonalbank separated the calibration of internal and external ratings (PD). A through-the-cycle (TTC) calibration has been used since for the RWA calculations (external perspective); this is based on long-term average default rates.

Another major building block used by Zürcher Kantonalbank in the IRB universe is the loss given default (LGD) model in retail, where own LGD estimates are permitted. This model uses the following LGD drivers:

- Collateral recovery ratio: the percentage of the estimated value of collateral (e. g. real estate for a mortgage) that can be recovered on sale, reducing the loss; broken down by type of collateral and, for real estate, type of property.
- Unsecured recovery ratio: the percentage of the unsecured portion that can still be repaid by the borrower, reducing the loss.
- Cure rate: the percentage of cases where the borrower moves out of default status within a year without a write off, meaning there is ultimately no loss.
- Recovery costs: the cost of processing defaults, added to the loan loss.
- Calibration is in line with the requirements for a downturn, and hence are different from the calibration used internally. The internal collateral recovery ratio is reduced so the current portfolio has an average LGD equal to the maximum in the last real estate crisis.

Breakdown of EAD by different approaches as at 31 December 2021

EAD in percent	SA-BIS	IRB
Central governments and central banks	100%	0%
Banks and securities firms	18%	82%
Other public-sector entities, multilateral development banks	100%	0%
Corporates	13%	87%
Retail: covered by mortgages	1%	99%
Retail: other retail exposures	100%	0%
Equity	0%	100%
Other exposures	100%	0%
Total	**12%**	**88%**

10.11 CR6: IRB: credit risk exposures by portfolio and probability of default (PD) range

31.12.2021 in million CHF (unless stated otherwise)	a Original on-balance-sheet gross exposure	b Off-balance-sheet exposures pre CCF	c Average CCF in %	d EAD post-CRM and post-CCF	e Average PD in %	f Number of obligors	g Average LGD in %	h Average maturity in years	i RWA	j RWA density in %	k EL	l Provisions
1 Central governments and central banks (F-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–		–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
2 Central governments and central banks (A-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
3 Banks and securities firms (F-IRB) by PD range												
0.00 to <0.15	885	975	53.9%	1,665	0.1%	94	45.0%	1.3	378	22.7%	1	
0.15 to <0.25	535	330	27.2%	546	0.2%	51	45.0%	1.1	186	34.2%	0	
0.25 to <0.50	79	45	28.6%	106	0.3%	56	45.0%	1.2	53	50.0%	0	
0.50 to <0.75	51	55	48.4%	169	0.7%	25	45.0%	1.0	127	75.1%	0	
0.75 to <2.50	1,083	333	27.4%	868	1.3%	48	45.0%	1.0	886	102.2%	5	
2.50 to <10.00	308	316	34.5%	220	5.0%	70	45.0%	1.5	322	146.5%	5	
10.00 to <100.00	11	118	20.3%	25	19.1%	40	45.0%	0.5	56	221.4%	2	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	2,951	2,172	43.1%	3,599	0.9%	384	45.0%	1.2	2,009	55.8%	14	–

31.12.2021 in million CHF (unless stated otherwise)	a Original on-balance-sheet gross exposure	b Off-balance-sheet exposures pre CCF	c Average CCF in %	d EAD post-CRM and post-CCF	e Average PD in %	f Number of obligors	g Average LGD in %	h Average maturity in years	i RWA	j RWA density in %	k EL	l Provisions
4 Banks and securities firms (A-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
5 Other public sector entities, multilateral development banks (F-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
6 Other public sector entities, multilateral development banks (A-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
7 Corporates: specialised lending (F-IRB) by PD range												
0.00 to <0.15	817	1,780	75.2%	2,155	0.1%	20	41.7%	1.5	447	20.7%	1	
0.15 to <0.25	3,219	2,808	75.0%	5,325	0.2%	100	41.6%	2.0	1,737	32.6%	3	
0.25 to <0.50	11,244	4,727	74.7%	14,776	0.3%	695	39.3%	2.5	7,421	50.2%	18	
0.50 to <0.75	2,493	692	75.0%	3,012	0.6%	421	39.2%	2.4	2,119	70.4%	8	
0.75 to <2.50	2,121	406	75.0%	2,425	1.2%	563	40.5%	2.8	2,309	95.2%	12	
2.50 to <10.00	173	9	75.0%	180	3.1%	88	42.5%	2.6	236	130.9%	2	
10.00 to <100.00	21	5	73.4%	24	10.1%	1	43.4%	2.7	49	200.1%	1	
100.00 (Default)	62	1	75.0%	49	–	9	–	–	52	106.0%	–	
Sub-total	20,150	10,427	74.9%	27,946	0.4%	1,897	40.0%	2.3	14,369	51.4%	45	14

31.12.2021 in million CHF (unless stated otherwise)	a Original on-balance-sheet gross exposure	b Off-balance-sheet exposures pre CCF	c Average CCF in %	d EAD post-CRM and post-CCF	e Average PD in %	f Number of obligors	g Average LGD in %	h Average maturity in years	i RWA	j RWA density in %	k EL	l Provisions
8 Corporates: specialised lending (A-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
9 Corporates: other lending (F-IRB) by PD range												
0.00 to <0.15	630	2,925	74.0%	2,795	0.1%	88	44.6%	1.9	672	24.1%	1	
0.15 to <0.25	1,002	1,175	71.8%	1,846	0.2%	75	40.8%	1.8	624	33.8%	1	
0.25 to <0.50	2,094	3,975	73.5%	4,663	0.4%	908	40.4%	1.9	2,311	49.6%	7	
0.50 to <0.75	1,333	1,462	70.1%	2,339	0.7%	939	41.4%	1.9	1,634	69.9%	7	
0.75 to <2.50	3,434	2,031	72.7%	4,839	1.4%	1,870	41.0%	1.9	4,236	87.5%	29	
2.50 to <10.00	859	342	72.0%	1,027	3.9%	1,172	40.3%	2.3	1,162	113.1%	16	
10.00 to <100.00	48	12	72.6%	47	13.8%	93	39.5%	2.6	84	177.0%	3	
100.00 (Default)	217	234	67.6%	242	–	182	–	–	257	106.0%	–	
Sub-total	9,618	12,156	72.7%	17,799	0.9%	5,327	40.8%	1.9	10,979	61.7%	64	95
10 Corporates: other lending (A-IRB) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
11 Retail: covered by mortgages by PD range												
0.00 to <0.15	18,651	1,156	75.0%	19,517	0.1%	37,621	19.4%	3.0	1,176	6.0%	3	
0.15 to <0.25	10,386	654	75.0%	10,876	0.2%	12,398	21.8%	3.0	1,439	13.2%	4	
0.25 to <0.50	19,856	1,440	75.0%	20,936	0.4%	21,948	24.7%	3.1	5,007	23.9%	18	
0.50 to <0.75	8,566	794	75.0%	9,161	0.6%	7,253	27.0%	3.1	3,534	38.6%	15	
0.75 to <2.50	6,835	595	75.0%	7,281	1.2%	6,378	28.1%	3.1	4,578	62.9%	25	
2.50 to <10.00	1,119	104	75.0%	1,196	3.6%	1,523	27.5%	3.1	1,412	118.0%	12	
10.00 to <100.00	46	4	75.0%	49	13.0%	50	29.4%	2.3	112	227.2%	2	
100.00 (Default)	126	4	75.0%	118	–	142	–	–	125	106.0%	–	
Sub-total	65,585	4,751	75.0%	69,135	0.4%	87,313	23.4%	3.0	17,384	25.1%	79	11

31.12.2021 in million CHF (unless stated otherwise)	a Original on-balance-sheet gross exposure	b Off-balance-sheet exposures pre CCF	c Average CCF in %	d EAD post-CRM and post-CCF	e Average PD in %	f Number of obligors	g Average LGD in %	h Average maturity in years	i RWA	j RWA density in %	k EL	l Provisions
12 Retail: qualifying revolving exposures (QRRE) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
13 Other retail exposures by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
14 Equity (PD / LGD approach) by PD range												
0.00 to <0.15	–	–	–	–	–	–	–	–	–	–	–	
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	
0.25 to <0.50	–	–	–	–	–	–	–	–	–	–	–	
0.50 to <0.75	–	–	–	–	–	–	–	–	–	–	–	
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	
Sub-total	–	–	–	–	–	–	–	–	–	–	–	–
Total (all portfolios)	**98,303**	**29,506**	**71.7%**	**118,478**	**0.5%**	**94,921**	**24.8%**	**2.6**	**44,740**	**37.8%**	**203**	**120**

Zürcher Kantonalbank was not using any credit derivatives for hedging purposes on the reporting date under the credit risk rules. Therefore, there was no impact on RWA.

10.12 CR7: IRB: effect on RWA of credit derivatives used as CRM techniques

Zürcher Kantonalbank was not using any credit derivatives for hedging purposes on the reporting date under the cred-it risk rules. Therefore, there was no impact on RWA.

10.13 CR8: IRB: RWA flow statements of credit risk exposures under IRB

31.12.2021		a
in CHF million		RWA amounts
1	**RWA as at end of previous reporting period (30.06.2021)**	**42,989**
2	Asset size changes	1,322
3	Asset quality changes	505
4	Model updates	–
5	Methodology and policy changes	–
6	Acquisions and disposals (of entities)	–
7	Foreign exchange movements	-75
8	Other	–
9	**RWA as at end of current reporting period**	**44,740**

Compared with 30 June 2021 the RWA of credit risk exposures under the IRB approach rose, primarily due to an increased volume of assets (CHF 1,322 million). Lower client ratings led to a slight decrease in the credit quality of assets and a corresponding increase in RWA of CHF 505 million. The changes in exchange rates in the second half of 2021 were minor. Overall, this resulted in net RWA growth of CHF 1,751 million as at 31 December 2021.

10.14 CR9: IRB: back-testing of PD per portfolio

With the adoption of the IRB approach as per 31 December 2017, the average historical annual default rate in percent as per 31 December 2021 is based on the four-year average.

a and b	c	c	c	d	e	f	f	g	h	i
	External rating equivalent					Number of obligors				
31.12.2021	S&P	Moody's	Fitch	Weighted average PD in %	Arithmetic average PD by obligors in %	End of previous year	End of the year	Number of defaulted obligors in the year	of which number of new defaulted obligors in the year	Average historical annual default rate in %
1 Central governments and central banks (FIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
2 Central governments and central banks (AIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
3 Banks and securities firms (FIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	0.1%	0.0%	95	94	–	–	–
0.15 to <0.25	A-	A3	A-	0.2%	0.2%	55	51	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	0.3%	0.3%	55	56	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	0.7%	0.7%	26	25	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	1.3%	1.2%	50	48	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	5.0%	4.7%	78	70	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	19.1%	23.4%	29	40	–	–	0.8%
100.00 (Default)	D	D	D	–	–	1	–	–	–	–
Subtotal	–	–	–	0.9%	1.1%	389	384	–	–	0.1%

a and b	c	c	c	d	e	f	f	g	h	i
	External rating equivalent					Number of obligors				
31.12.2021	S&P	Moody's	Fitch	Weighted average PD in %	Arithmetic average PD by obligors in %	End of previous year	End of the year	Number of defaulted obligors in the year	of which number of new defaulted obligors in the year	Average historical annual default rate in %
4 Banks and securities firms (AIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
5 Other public sector entities, multilateral development banks (FIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
6 Other public sector entities, multilateral development banks (AIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
7 Corporates: specialised lending (FIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	0.1%	0.1%	26	20	–	–	–
0.15 to <0.25	A-	A3	A-	0.2%	0.2%	93	100	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	0.3%	0.3%	633	695	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	0.6%	0.6%	389	421	1	–	0.1%
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	1.2%	1.2%	540	563	–	–	0.2%
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	3.1%	2.8%	102	88	1	–	0.8%
10.00 to <100.00	B to C	B2 to C	B to C	10.1%	10.1%	–	1	–	–	–
100.00 (Default)	D	D	D	-	-	9	9	–	–	–
Subtotal	–	–	–	0.4%	0.4%	1,792	1,897	2	–	0.1%

a and b	c	c	c	d	e	f	f	g	h	i
	External rating equivalent					Number of obligors				
31.12.2021	S&P	Moody's	Fitch	Weighted average PD in %	Arithmetic average PD by obligors in %	End of previous year	End of the year	Number of defaulted obligors in the year	of which number of new defaulted obligors in the year	Average historical annual default rate in %
8 Corporates: specialised lending (AIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
9 Corporates: other lending (FIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	0.1%	0.1%	75	88	–	–	–
0.15 to <0.25	A-	A3	A-	0.2%	0.2%	76	75	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	0.4%	0.4%	915	908	–	–	0.1%
0.50 to <0.75	BBB-	Baa3	BBB-	0.7%	0.7%	905	939	–	–	0.1%
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	1.4%	1.5%	1,933	1,870	7	1	0.7%
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	3.9%	4.5%	1,169	1,172	25	–	2.0%
10.00 to <100.00	B to C	B2 to C	B to C	13.8%	15.1%	70	93	5	1	8.6%
100.00 (Default)	D	D	D	-	-	196	182	–	–	–
Subtotal	–	–	–	0.9%	1.5%	5,339	5,327	37	2	0.8%
10 Corporates: other lending (AIRB) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
11 Retail: covered by mortgages by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	0.1%	0.1%	37,939	37,621	1	–	0.0%
0.15 to <0.25	A-	A3	A-	0.2%	0.2%	12,298	12,398	5	–	0.0%
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	0.4%	0.4%	21,268	21,948	9	–	0.1%
0.50 to <0.75	BBB-	Baa3	BBB-	0.6%	0.6%	6,946	7,253	3	–	0.1%
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	1.2%	1.3%	6,102	6,378	8	–	0.1%
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	3.6%	3.6%	1,372	1,523	5	2	0.5%
10.00 to <100.00	B to C	B2 to C	B to C	13.0%	12.6%	60	50	–	–	0.8%
100.00 (Default)	D	D	D	-	-	158	142	–	–	–
Subtotal	–	–	–	0.4%	0.4%	86,143	87,313	31	2	0.0%

a and b	c	c	c	d	e	f	f	g	h	i
	External rating equivalent					Number of obligors				
31.12.2021	S&P	Moody's	Fitch	Weighted average PD in %	Arithmetic average PD by obligors in %	End of previous year	End of the year	Number of defaulted obligors in the year	of which number of new defaulted obligors in the year	Average historical annual default rate in %
12 Retail: qualifying revolving exposures (QRRE) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
13 Other retail exposures by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
14 Equity (PD / LGD approach) by PD range										
0.00 to <0.15	AAA to A	Aaa to A2	AAA to A	–	–	–	–	–	–	–
0.15 to <0.25	A-	A3	A-	–	–	–	–	–	–	–
0.25 to <0.50	BBB+ / BBB	Baa1 / Baa2	BBB+ / BBB	–	–	–	–	–	–	–
0.50 to <0.75	BBB-	Baa3	BBB-	–	–	–	–	–	–	–
0.75 to <2.50	BBB- neg / BB+	Baa3 neg / Ba1	BBB- neg / BB+	–	–	–	–	–	–	–
2.50 to <10.00	BB to B+	Ba2 to B1	BB to B+	–	–	–	–	–	–	–
10.00 to <100.00	B to C	B2 to C	B to C	–	–	–	–	–	–	–
100.00 (Default)	D	D	D	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–	–	–	–
Total (all Portfolios)	–	–	–	**0.5%**	**0.5%**	**93,663**	**94,921**	**70**	**4**	**0.1%**

There were no material changes in the back-testing of PD per portfolio compared with the previous period.

10.15 CR10: IRB: specialised lending and equities under the simple risk weight method

Zürcher Kantonalbank does not use the supervisory slotting approach for special financing. Hence, only equity securities under the simplified risk weight method have to be disclosed in table CR10.

Equities under the simple risk weight approach 31.12.2021 in CHF million (unless stated otherwise)	On-balance-sheet amount	Off-balance-sheet amount	Risk weight in %	Exposure amount	RWA
Exchange-traded equity exposures	8	–	300%	8	26
Private equity exposures	131	–	400%	131	554
Other equity exposures	1	0	400%	2	6
Total	**140**	**0**		**140**	**586**

There were no material changes in equities under the simple risk weight method compared to 30 June 2021.

11 Counterparty credit risk

11.1 CCRA: Counterparty credit risk: qualitative disclosure related to counterparty credit risk

Relevant divisions

Trading activities at Zürcher Kantonalbank with counterparty credit risk include bilateral OTC derivatives, repos and SLB transactions. Zürcher Kantonalbank is also a clearing member of central counterparties for OTC derivatives, exchange traded derivatives (ETDs) and repos, and provides clearing services for clients. In some market segments, Zürcher Kantonalbank also uses access to central counterparties through a clearing broker. The client base includes financial institutions, corporates and public-sector entities.

Organisation, processes and methods

In procedural and organisational terms, management of counterparty credit risk is integrated into that of credit risk. Counterparty credit risk is managed at the level of individual counterparties using limits monitored in real time. Compliance can be examined with a pre-deal check before a transaction is executed. When calculating limit utilisation, both, current exposure and potential future exposure in three maturity bands are taken into account.

Contractual collateralisation agreements are offset separately as risk reduction. In addition to the separate perspective, limit utilisation is also compared to all other credit exposures to a counterparty combined and to its overall credit risk limit. Counterparty credit risk is also included in credit risk measurement at portfolio level and in the calculation of capital at risk and expected loss in the Credit Risk Portfolio Management System. For central counterparties, both, potential future exposure and contributions to the default fund and the initial margin are also taken into account.

Risk mitigation techniques and wrong way risk

With bilateral OTC derivatives, Zürcher Kantonalbank aims for collateralisation by means of netting agreements and collateral support annexes (CSAs), especially when dealing with financial institutions and large corporates. Where this is not possible, alternative collateral is often agreed, e. g. in the form of mortgages. Conservative rules apply as regards currency, quality and overcollateralisation (haircut) for collateral that Zürcher Kantonalbank accepts for derivative, repo and SLB transactions. Counterparties are expressly forbidden from posting their own bonds or equities as collateral.

Impact of a rating downgrade on guarantees given

Zürcher Kantonalbank has been awarded the highest rating from the major rating agencies Standard & Poor's, Moody's and Fitch. A downgrade of Zürcher Kantonalbank would not mean an immediate and material increase in the collateral/guarantees demanded by counterparties in SLB, repo and derivatives business. Zürcher Kantonalbank mostly uses standard agreements for this business; these do not contain any clauses triggering the issue of more guarantees when the bank's own rating deteriorates.

11.2 CCR1: Counterparty credit risk: analysis of counterparty credit risk (CCR) exposure by approach

31.12.2021 in CHF million (unless stated otherwise)		a Replacement cost	b Potential future exposure	c EEPE (effective expected positive exposure)	d Alpha used for computing regulatory EAD	e EAD post-CRM	f RWA
1	SA-CCR (for derivatives)	1,353	3,934	[redacted]	1.4	7,402	3,681
2	IMM (for derivatives and SFTs)	[redacted]	[redacted]	–	–	–	–
3	Simple approach for risk mitigation (for SFTs)	[redacted]	[redacted]	[redacted]	[redacted]	–	–
4	Comprehensive approach for risk mitigation (for SFTs)	[redacted]	[redacted]	[redacted]	[redacted]	5,532	3,065
5	VaR for SFTs	[redacted]	[redacted]	[redacted]	[redacted]	–	–
6	**Total**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	**6,746**

Both replacement cost and potential future exposure for derivatives fell compared to 30 June 2021. As a result, EAD post-CRM for derivatives was CHF 989 million lower. With an average risk weight of counterparties for derivative transactions of around 50 percent as at 31 December 2021, this resulted in RWA of CHF 3,681 million (CHF - 863 million compared to 30 June 2021). EAD post-CRM for SFTs did not change significantly (CHF - 62 million). As the average risk weight for SFTs increased from 54 percent to 55 percent, RWA as at 31 December 2021 were CHF 45 million higher than at the end of June 2021.

11.3 CCR2: Counterparty credit risk: credit valuation adjustment (CVA) capital charge

31.12.2021 in CHF million		a EAD post-CRM	b RWA
	Total portfolios subject to the Advanced CVA capital charge	–	–
1	VaR component (including the 3 × multiplier)	[redacted]	–
2	Stressed VaR component (including the 3 × multiplier)	[redacted]	–
3	All portfolios subject to the standardised CVA capital charge	7,402	2,859
4	**Total subject to the standardised CVA capital charge**	**7,402**	**2,859**

The changes shown in Table CCR1 are also displayed in Table CCR2. For the CVA, the CHF 989 million decrease in EAD post-CRM for derivatives resulted in a drop of CHF 276 million in RWA to CHF 2,859 million.

11.4 CCR3: Counterparty credit risk: standardised approach of CCR exposures by regulatory portfolio and risk weights

31.12.2021 in million CHF		a	b	c	d	e	f	g	h	i
	Exposure category / risk weight [1]	**0%**	**10%**	**20%**	**50%**	**75%**	**100%**	**150%**	**Other**	**Total credit exposure**
1	Central governments and central banks	82	–	–	–	–	384	–	–	466
2	Banks and securities firms	–	–	1,334	194	–	–	–	–	1,528
3	Other public sector entities and multilateral development banks	245	–	149	57	–	541	–	–	992
4	Corporates	–	–	229	387	–	2,489	–	–	3,105
5	Retail	–	–	–	–	–	213	–	–	213
6	Equity	–	–	–	–	–	–	–	–	–
7	Other exposures	–	–	–	–	–	389	–	–	389
8 [2]		–	–	–	–	–	–	–	–	–
9	**Total**	**327**	**–**	**1,711**	**638**	**–**	**4,018**	**–**	**–**	**6,693**

[1] According to FINMA-Circ. 16/1, the exposure category central counterparties (CCP) is not part of this table. We refer to table CCR8 for disclosures with respect to exposures to central counterparties.

[2] Currently, Zürcher Kantonalbank does not have credit exposures that would be disclosed in row 8 of this table.

Counterparty credit risk positions under the standardised approach sank by CHF 1,053 million compared with 30 June 2021. With the exception of central governments and central banks, positions in all segments are lower; in particular, the positions in the Corporates segment decreased compared with mid-2021 (CHF - 499 million).

11.5 CCR4: IRB: CCR exposures by portfolio and PD scale

31.12.2021 in CHF million (unless stated otherwise)	a EAD post-CRM	b Average PD in %	c Number of obligors	d Average LGD in %	e Average maturity in years	f RWA	g RWA density in %
1 Central governments and central banks (F-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
2 Central governments and central banks (A-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
3 Banks and securities firms (F-IRB) by PD range							
0.00 to <0.15	3,678	0.1%	90	45.0%	1.2	799	21.7%
0.15 to <0.25	1,072	0.2%	47	45.0%	0.9	351	32.7%
0.25 to <0.50	250	0.3%	54	45.0%	1.0	115	45.9%
0.50 to <0.75	54	0.7%	39	45.0%	1.2	35	65.8%
0.75 to <2.50	47	1.1%	31	45.0%	1.0	43	92.0%
2.50 to <10.00	31	6.0%	31	45.0%	1.0	49	157.1%
10.00 to <100.00	3	12.5%	11	45.0%	1.0	7	197.3%
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	5,135	0.2%	303	45.0%	1.1	1,399	27.3%
4 Banks and securities firms (A-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
5 Other public sector entities, multilateral development banks (F-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–

31.12.2021 in CHF million (unless stated otherwise)	a EAD post-CRM	b Average PD in %	c Number of obligors	d Average LGD in %	e Average maturity in years	f RWA	g RWA density in %
6 Other public sector entities, multilateral development banks (A-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
7 Corporates: specialised lending (F-IRB) by PD range							
0.00 to <0.15	4	0.1%	3	45.0%	1.0	1	15.1%
0.15 to <0.25	32	0.2%	5	45.0%	2.8	14	43.4%
0.25 to <0.50	351	0.3%	31	45.0%	4.9	285	81.2%
0.50 to <0.75	24	0.6%	7	45.0%	4.9	27	113.4%
0.75 to <2.50	9	1.0%	2	45.0%	5.0	12	132.1%
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	420	0.3%	48	45.0%	4.7	339	80.6%
8 Corporates: specialised lending (A-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
9 Corporates: other lending (F-IRB) by PD range							
0.00 to <0.15	311	0.1%	32	45.0%	3.5	100	32.1%
0.15 to <0.25	128	0.2%	23	45.0%	2.3	53	41.4%
0.25 to <0.50	150	0.4%	75	45.0%	2.1	90	60.1%
0.50 to <0.75	32	0.7%	31	45.0%	2.1	26	80.5%
0.75 to <2.50	55	1.5%	53	45.0%	1.4	52	95.9%
2.50 to <10.00	1	5.6%	12	45.0%	1.0	1	136.1%
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	2	–	4	–	–	3	106.0%
Subtotal	679	0.3%	230	44.8%	2.7	325	47.9%
10 Corporates: other lending (A-IRB) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
11 Retail: covered by mortgages by PD range							
0.00 to <0.15	2	0.1%	39	52.7%	1.0	0	16.2%
0.15 to <0.25	1	0.2%	9	43.9%	4.2	0	28.8%
0.25 to <0.50	1	0.4%	19	56.3%	1.2	1	54.0%
0.50 to <0.75	0	0.6%	4	54.3%	1.0	0	76.0%
0.75 to <2.50	2	1.2%	5	56.2%	4.3	2	123.0%
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	7	0.5%	76	53.6%	2.3	4	58.4%

31.12.2021 in CHF million (unless stated otherwise)	a EAD post-CRM	b Average PD in %	c Number of obligors	d Average LGD in %	e Average maturity in years	f RWA	g RWA density in %
12 Retail: qualifying revolving exposures (QRRE) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
13 Other retail exposures by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
14 Equity (PD/LGD approach) by PD range							
0.00 to <0.15	–	–	–	–	–	–	–
0.15 to <0.25	–	–	–	–	–	–	–
0.25 to <0.50	–	–	–	–	–	–	–
0.50 to <0.75	–	–	–	–	–	–	–
0.75 to <2.50	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–
Subtotal	–	–	–	–	–	–	–
Total all portfolios	**6,241**	**0.2%**	**657**	**45.9%**	**1.5**	**2,067**	**33.1%**

CCR exposures under the IRB approach scarcely changed over the period (CHF + 1 million). RWA were therefore stable compared with 30 June 2021 (CHF - 39 million).

11.6 CCR5: Counterparty credit risk: composition of collateral for CCR exposure

	a	b	c	d	e	f
	Collateral used in derivative transactions				Collateral used in SFTs	
31.12.2021	Fair value of collateral received		Fair value of posted collateral		Fair value of collateral received	Fair value of posted collateral
in CHF million	Segregated	Unsegregated	Segregated	Unsegregated		
Cash – CHF	–	1,009	–	1,396	286	15,102
Cash – other currencies	–	1,280	–	1,238	4,109	11,199
Swiss Confederation sovereign debt	–	66	–	232	4,049	3,952
Other domestic public authority debt	–	195	–	10	1,051	134
Foreign sovereign and public authority debt	–	16	–	475	15,439	12,681
Corporate bonds	–	971	–	273	20,475	8,449
Equity securities	–	1,121	–	235	11,314	5,555
Other collateral	–	–	–	–	–	–
Total	**–**	**4,659**	**–**	**3,860**	**56,722**	**57,072**

During the reporting period, there were no significant changes to the composition of collateral for CCR exposure. The totals for collateral received and posted for derivative transactions and for SFTs were largely stable.

11.7 CCR6: Counterparty credit risk: credit derivatives exposures

31.12.2021 in CHF million	a Protection bought	b Protection sold
Notionals		
Single-name CDSs	16	–
Index-CDSs	340	309
Total return swaps	12	–
Credit options	–	–
Other credit derivatives	–	–
Total notionals	**368**	**309**
Fair values		
Positive replacement value (asset)	0	13
Negative replacement value (liability)	13	0

The notional amount of protection purchased remained essentially unchanged compared to 30 June 2021, with shifts from single-name CDSs to index-CDSs. The notional amount of protection sold rose by CHF 192 million over the reporting period. The positive and negative replacement values did not change significantly.

11.8 CCR7: Counterparty credit risk: RWA flow statements of CCR exposures under the Internal Model Method (IMM)

Zürcher Kantonalbank does not use the IMM approach.

11.9 CCR8: Counterparty credit risk: exposures to central counterparties

	31.12.2021 in CHF million	a EAD (post-CRM)	b RWA
1	**Exposures to QCCPs (total)**		**120**
2	Exposures for trades at QCCPs (excluding initial margin and default fund contributions)	2,068	41
3	of which OTC derivatives	1,024	20
4	of which exchange-traded derivatives	422	8
5	of which SFTs	623	12
6	of which netting sets where cross-product netting has been approved	–	–
7	Segregated initial margin	–	
8	Non-segregated initial margin	1,555	31
9	Pre-funded default fund contributions	120	47
10	Unfunded default fund contributions	–	–
11	**Exposures to non-QCCPs (total)**		**–**
12	Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions)	–	–
13	of which OTC derivatives	–	–
14	of which exchange-traded derivatives	–	–
15	of which SFTs	–	–
16	of which netting sets where cross-product netting has been approved	–	–
17	Segregated initial margin	–	
18	Non-segregated initial margin	–	–
19	Pre-funded default fund contributions	–	–
20	Unfunded default fund contributions	–	–

With the exception of the pre-funded default fund contributions, the risk weight for EAD (post-CRM) with CCPs remains unchanged at 2 percent. Therefore, the change in RWA is linear to the change in the exposures to QCCPs. There continues to be no exposure to non-QCCPs. EAD (post-CRM) for the pre-funded default fund contributions as at 31 December 2021 decreased by CHF 42 million. As the average risk weights of the positions delivered to the default fund as at the reporting date are higher than as at 30 June 2021, RWA have increased by CHF 2 million despite lower EAD (after CRM).

12 Securitisations

12.1 SECA: Securitisations: qualitative disclosure requirements related to securitisation exposures

Currently, Zürcher Kantonalbank does not have any securitisation positions in the banking book.

The bank holds securitisation positions in the trading book. These are solely positions arising from issuing securitisations for clients, as investments for money raised from issuing structured products and from market making. The maximum volume for total securitisation positions in the trading book is specifically limited. Zürcher Kantonalbank acts only as an investor in such cases. All positions are traditional securitisations where the assets to be securitised are actually sold to the issuing company, the special purpose vehicle (SPV).

The positions are carried in the bank's trading portfolio. As with other trading transactions, they are therefore recognised at fair value. This is defined as the amount for which an asset could be exchanged or a liability settled between knowledgeable, willing and independent parties. This corresponds to the price set on a price-efficient and liquid market or a theoretical price determined on the basis of a valuation model. The conditions for calculating a price in this manner are listed in Table LIA. Where, as an exception, no fair value is ascertainable, valuation and recognition follow the principle of the lower of cost or market value. Valuation differences are recognised in the income statement.

12.2 SEC1: Securitisations: exposures in the banking book

Currently, Zürcher Kantonalbank does not have any securitisation positions in the banking book.

12.3 SEC2: Securitisations: exposures in the trading book

		a	b	c	e	f	g	i	j	k
31.12.2021		Bank acts as originator			Bank acts as sponsor			Banks acts as investor		
in CHF million		Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total
1	**Retail (total)**	**–**	**–**	**–**	**–**	**–**	**–**	**1**	**–**	**1**
2	of which residential mortgage	–	–	–	–	–	–	–	–	–
3	of which credit card	–	–	–	–	–	–	0	–	0
4	of which other retail exposures	–	–	–	–	–	–	1	–	1
5	of which re-securitisation	–	–	–	–	–	–	–	–	–
6	**Wholesale (total)**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**

During the reporting period, there were no material changes to the securitisation exposures in the trading book.

12.4 SEC3: Securitisations: exposures in the banking book and associated regulatory capital requirements - bank acting as originator or as sponsor

Currently, Zürcher Kantonalbank does not have any securitisation positions in the banking book.

12.5 SEC4: Securitisations: exposures in the banking book and associated capital requirements - bank acting as investor

Currently, Zürcher Kantonalbank does not have any securitisation positions in the banking book.

13 Market risk

13.1 MRA: Market risk: general qualitative disclosure requirements related to market risk

Market risks in the trading book

Strategy

In the trading business, Zürcher Kantonalbank pursues a strategy focused on client transactions. The individual desks hold trading mandates approved by the Risk Committee of the Executive Board, which set out the basic conditions in terms of the objectives pursued, instruments used for underlying and hedging transactions, the form of risk management, and the holding period.

Organisation of the market risk management function

The preventative risk management and risk control functions are separated from risk management at Executive Board level. The responsibilities of the preventative risk management function, which is independent of Trading, and the risk control function downstream of it include the monitoring of compliance with risk limits and trading mandates, the calculation and analysis of the result from trading activities (P&L) and risk figures, as well as the preventative analysis of potentially high-risk transactions. The risk organisation is also responsible for defining and implementing methods of risk measurement, their independent validation, and internal and external risk reporting.

In addition to the ongoing contact between Trading and the risk management units, there are also regular meetings which provide an institutionalised platform for communications between Trading, Risk and Compliance. In these meetings, the risk profile is scrutinised and trends in the P&L, the breakdown of the P&L and the positioning of Trading are discussed. Monitoring issues are also considered, such as compliance with limits or the checking of valuation parameters.

Risk measurement and limitation

Market risks are measured, managed and controlled on the one hand by assigning risk capital in accordance with the capital at risk approach and on the other by using value at risk limits. This is supplemented by the periodic performance of stress tests and by the monitoring of market liquidity risks. The value of trading positions is determined using the fair value method, whereby marking to market or marking to model, which is subject to stricter rules, is applied on a daily basis.

The "trading market risks" capital at risk corresponds to the assigned risk capital for the market risks of trading transactions on a one-year horizon and at a confidence level of 99.9 percent. The modelling is based on a stressed value at risk (stressed VaR). Besides general market risks, the model also takes into account issuer default risks.

Zürcher Kantonalbank calculates value at risk for a 10-day period and at a confidence level of 99 percent using a Monte Carlo simulation. The loss distribution is arrived at from the valuation of the portfolio using a large number of scenarios (full valuation). The necessary parameters for determining the scenarios are estimated on the basis of historical market data, with more recent observations being accorded a higher weighting for the forecasting of volatility than less recent ones. As a result, value at risk responds rapidly to any changes in volatility on the markets. Value at risk is calculated on a daily basis for the entire trading book. The four groups of risk factors - commodities, currencies, interest rates and equities - are calculated and shown both separately and on a combined basis.

The bank uses different types of scenarios for stress-testing. Historical and hypothetical scenarios are used to estimate the loss that could result from extreme but plausible macroeconomic stress events. Each scenario is based on the expected development of market indicators for the corresponding scenario. In this way the bank can identify potential vulnerabilities and risk concentrations, analyse them better and then take action. In matrix scenarios, all market prices and their corresponding volatilities are heavily skewed. Such a scenario might include a 30 percent general fall in equity market prices with a simultaneous 70 percent increase in market volatility. This enables the identification of the risk of losses due to general changes in prices and volatility. Non-linearity or asymmetry of risks can also be observed in the matrix scenarios. Stress tests are carried out for all trading as well as for trading areas.

The bank additionally monitors the market liquidity risk of individual portfolios. In the equity derivatives sector, the potential trading volume resulting from the hedging strategy in the event of a change in the key risk factors is compared with the total market volume. Hypothetical offsetting expenses are calculated for bonds and bond-type products, based on observed bid-ask spreads and taking into account additional pricing supplements / discounts. Large positions are examined regularly to ensure there is sufficient liquidity; if necessary, valuation reserves are recognised, causing a reduction in core capital in the context of capital adequacy.

The bank performs daily back-testing for the purpose of examining the forecast accuracy of the value at risk. Regulatory back-testing is based on a comparison of the value at risk for a holding period of one day with the back-testing result. Breaches of limits are notified immediately to the competent authorities if the number of breaches exceeds expectations. For further information on the back-testing results, please see Table MR4 starting from page 77.

The market risk model is validated annually on the basis of a defined process. Validation comprises both standardised quantitative analyses, such as back-testing, and in-depth investigations in selected focus areas. In addition to the annual review of the model, risks not modelled in the value at risk are periodically analysed in a separate process and monitored with regard to materiality.

Reporting

The CRO report is a quarterly report from the risk organisation, produced independently of the risk managers, informing the Executive Board and Board of Directors of events, the risk profile and market risk monitoring. Information is provided in tables, graphs and commentaries on trends in the individual sub-portfolios and risk factors as well as overall market risk in trading. In addition to management reporting, there are also special reports on selected issues of special relevance and/or topicality. These reports are also seen by FINMA and the external auditor. In addition, every year, the Executive Board and Board of Directors receive reports on the suitability and effectiveness of internal controls in market risk management. When special developments or events occur, the Executive Board and Board of Directors are informed on an ad hoc basis of changes in the risk profile in additional reports and analyses.

Apart from the management reporting, there are also various monitoring reports on the P&L and market risk measurement. These support risk monitoring in the Risk unit and in Trading. Unlike the management reporting, the monitoring reports focus on a limited presentation of specific risks or portfolios. Depending on their subject, these monitoring reports are produced at shorter intervals (in some cases several times a day), as the production of monitoring reports is often more automated than for the management reporting described above.

Risk measurement systems

Details of the systems used are given in Table OVA starting from page 13. For further information on the market risk model approach, please see Table MRB starting from page 76.

Market risks in the banking book

For further information on the market risks in the banking book, please see the IRRBB Tables on page 78.

13.2 MR1: Market risk: market risk under SA

31.12.2021		a
in Mio. CHF		RWA
	Outright-Produkte	
1	Zinsrisiko (allgemeines und spezifisches)	1,554
2	Aktienrisiko (allgemeines und spezifisches)	–
3	Wechselkursrisiko	–
4	Rohstoffrisiko	–
	Optionen	
5	Vereinfachtes Verfahren	–
6	Delta-Plus-Verfahren	–
7	Szenarioanalyse	–
8	Verbriefungen	0
9	**Total**	**1,554**

The issuing activity of domestic issuers led to brisk client activity and above-average sales, which was reflected in a higher bond portfolio in interest rate trading. The total RWA for market risk under the standardised approach increased by CHF 234 million to CHF 1,554 million during the reporting period.

13.3 MRB: Market risk: qualitative disclosures for banks using the Internal Model Approach (IMA)

Stressed VaR includes commodities, currencies, interest rates and equities as risk factor groups and is calculated for the entire trading book as well as for commodity and currency risk in the banking book. Capital adequacy for specific interest rate risks uses the standard approach, which covers residual interest rate risk and event (especially rating migration) and default risk. Therefore, there is no modelling of residual interest rate risk or calculation of an incremental risk charge (IRC) when calculating capital adequacy requirements under the model approach in VaR or stressed VaR. Thus, the capital adequacy requirement for market risk is the total of the capital adequacy requirement under the standard approach, which covers specific interest rate risk, plus that under the model approach, which covers general market risk. For internal risk management and monitoring the full model is used, which covers both, general market risk and residual interest rate risk.

VaR and stressed VaR are based on the same model across the group. Zürcher Kantonalbank uses a Monte Carlo method to determine VaR and stressed VaR. The distribution of risk factors is parameterised by estimating a covariance matrix. The loss distribution in VaR and stressed VaR is arrived at from the valuation of the portfolio using a large number of manufactured scenarios with full valuation. Both VaR and stressed VaR are calculated directly on a 10-day horizon using a 99 percent confident interval, so no scaling is necessary. The assumption when calculating VaR is that the portfolio remains unchanged during the holding period and does not age, i. e. the residual maturity does not fall.

For VaR, market data used to value the portfolio in the basic scenario is obtained daily. The market data history to re-estimate the covariance matrix is obtained at least weekly.

The covariance matrix is estimated based on a one-year market data history. More recent observations are weighted more heavily than older ones when forecasting volatility.

Absolute risk factor changes are modelled for interbank rate curves and credit spread curves; relative risk factor changes are modelled for equity prices, equity index levels, implied volatility, exchange rates, precious metals prices and commodity prices.

The estimation period for stressed VaR is from 6 March 2008 to 6 March 2009. This was calculated using a delta-normal VaR model and is reviewed regularly.

Stress-testing mainly uses economic stress scenarios across risk factor groups with probabilities that are very low but nevertheless relevant over the long term, plus stress scenarios as a sensitivity analysis. Historically observed stress events are a key element in defining and updating a broad set of stress scenarios, including hypothetical ones. The stress tests use the same positions and risk factors as the VaR.

Back-testing is a central element in controlling value at risk calculated in the model procedure and acts as a quantitative validation of the risk model. Back-testing involves comparing the back-testing VaR on a one-day time horizon against the daily back-testing P&L. The back-testing P&L is calculated as the realised P&L including position changes as a result of intraday transactions, but excluding securities lending fees, commissions and issue proceeds. Unlike the VaR used to calculate capital adequacy requirements, back-testing VaR does not model residual interest rate risk. Therefore, it is consistent with the VaR used for internal risk management and monitoring and its comparator variable, the P&L.

13.4 MR2: Market risk: RWA flow statements of market risk exposures under IMA

31.12.2021		a	b	c	d	e	f
in CHF million		VaR	Stressed VaR	IRC	CRM	Other	Total RWA
1	**RWA as at end of previous reporting period (30.06.2021)**	**290**	**1,377**	**–**	**–**	**–**	**1,668**
2	Movement in risk levels [1]	29	477	–	–	–	505
3	Model updates / changes	50	-240	–	–	–	-189
4	Methodology and policy changes	–	–	–	–	–	–
5	Acquisitions and disposals (of entities)	–	–	–	–	–	–
6	Foreign exchange movements [1]	–	–	–	–	–	–
7	Other	–	–	–	–	–	–
8	**RWA as at end of current reporting period**	**369**	**1,614**	**–**	**–**	**–**	**1,984**

[1] The effect of foreign exchange movements is captured in movement in risk levels, since foreign exchange rate movements are part of the effects of market movements on risk levels.

The total RWA of exposures under the internal model approach (IMA) increased by CHF 316 million to CHF 1,984 million during the reporting period. The increase in RWA reflects higher interest rate and credit risks as well as increased volatility on the capital markets. The RWA decrease from model changes mainly results from modelling adjustments in connection with the replacement of LIBOR at the end of 2021.

13.5 MR3: Market risk: IMA values for trading portfolios

31.12.2021		
in CHF million		a
VaR (10 day 99%)		
1	Maximum value	12
2	Average value	8
3	Minimum value	5
4	**Period end**	**12**
Stressed VaR (10 day 99%)		
5	Maximum value	49
6	Average value	37
7	Minimum value	29
8	**Period end**	**40**
Incremental risk charge (99.9%)		
9	Maximum value	–
10	Average value	–
11	Minimum value	–
12	**Period end**	**–**
Comprehensive risk capital charge (99.9%)		
13	Maximum value	–
14	Average value	–
15	Minimum value	–
16	**Period end**	**–**
17	Floor (standardised measurement method)	–

VaR and stressed VaR were at slightly higher levels towards the end of the reporting period than at the end of the first half of 2021. The increase reflects higher interest rate and credit risks as well as increased volatility on the capital markets.

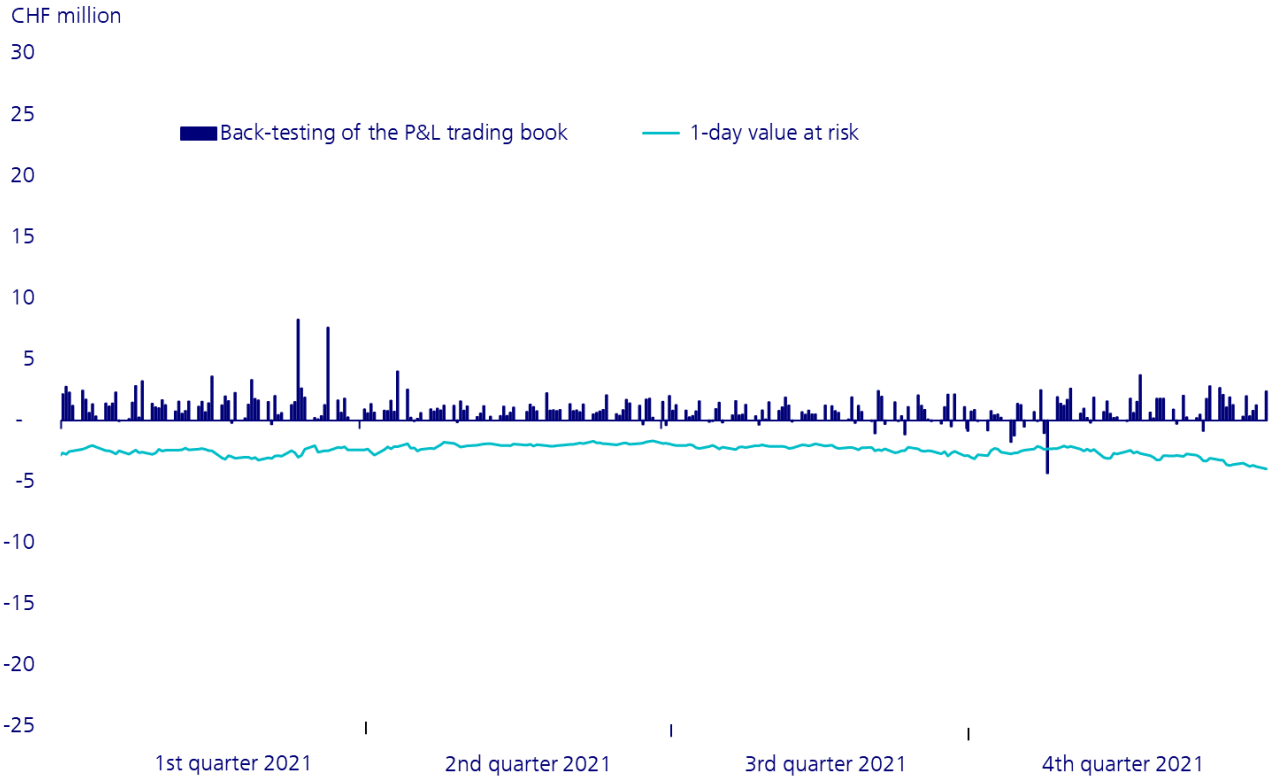
13.6 MR4: Market risk: comparison of VaR estimates with gains/losses

The quality of the value at risk approach used is assessed by comparing the value at risk for a holding period of one day with the daily back-testing result. The back-testing result is based on the result from trading activities, adjusted for commission income. Unlike a hypothetical P&L, the back-testing result includes intraday trading income. In the case of a one-day holding period and 99-percent quantile, the value at risk is expected to be exceeded two to three times each year.

Back-testing results for the year 2021

A breach of back-testing limits in the Zürcher Kantonalbank market risk model approach occurred, when a daily loss in trading is higher than the model predicts. In 2021, there was one breach in the value at risk. The back-testing result therefore lies within the statistical expectation. The breach in the back-testing VaR on 29 October 2021 by CHF 2.0 million resulted from strong movements in interest rates and interest rate volatilities, which led to losses in both interest rate and money market trading.

The situation in the last four quarters was as follows:



14 Interest rate risk

14.1 IRRBBA: Interest rate risk: interest rate risk in the banking book (IRRBB) risk management objective and policies

Description of how the bank defines IRRBB for the purposes of managing and measuring risk

Balance sheet interest rate risk is the risk that changes in market interest rates will impact negatively on the financial situation of the banking book. Interest rate risk management takes into account both net present value (change in the economic value of equity - ΔEVE) and prospective earnings (change in net interest income - ΔNII). In managing interest rate risk in the banking book (IRRBB), Zürcher Kantonalbank pursues a strategy focussed on medium-term optimisation of net interest income. The interest rate risk is managed based on the market interest method. For client deposits and loans with a variable interest rate, the interest rate risk is determined by taking into account the bank's presumed future condition-setting behaviour and client behaviour. Product modelling is subject to an annual review and is approved by the Risk Committee of the Executive Board.

Description of the overall strategy of the bank to manage and mitigate IRRBB

Interest rate risk in the banking book is managed in strategic terms by the Board of Directors and in tactical terms by the CFO and Treasury. Treasury has delegated operational management of interest rate and currency risk for periods of less than one year to the Money Trading unit. The strategic interest rate risk position is set by the Board of Directors on a periodic basis in the form of an investment strategy for equity (equity benchmark). The CFO and

Treasury manage the deviation of the interest rate risk position in the banking book from the equity benchmark within the risk limits set by the Board of Directors. From the net present value perspective (EVE), interest rate risks are managed by allocating risk capital in accordance with the capital at risk approach (risk horizon one year, confidence level 99.9 percent) and by using value at risk limits (holding period 20 trading days, confidence level 99 percent). In addition, stress scenarios are simulated in order to analyse and limit the impact of extraordinary changes in the interest rate environment. Potential stress losses are also limited by the Board of Directors by means of benchmarks.

From the prospective earnings perspective (NII), stress tests provide an indication of the change in the structural contribution in the event of extraordinary changes in market interest rates with unchanged positioning over a one-year period. Potential losses of earnings are limited by the Executive Board. Besides the structural contribution, margin effects are particularly significant for client deposits with variable interest rates. Special monitoring tools allow such margin effects to be analysed and monitored for different interest rate scenarios over a period of several years.

At the weekly balance sheet meeting, Treasury discusses expected moves in interest rates, assesses the tactical interest rate positioning and sets hedging programmes. For hedging decisions, representatives of the Risk unit are consulted; for interest rate forecasts, the analysts in the internal research team of Zürcher Kantonalbank are consulted.

Risk measurement and monitoring and independent reporting of interest rate risk is the responsibility of the Risk unit, which is organisationally independent of the people managing the risk.

The Treasury Committee is a specialist body of the Risk Committee of the Executive Board, which regularly reviews the quality and appropriateness of asset-liability management. Chaired by the Head of Treasury, the Treasury Committee comprises people managing risk, representatives of sales, product management and controlling and members of the risk organisation.

Model Validation in the Risk unit acts as an independent controller to ensure that models are appropriate and that material model uncertainties are taken into account. The modelling of variable products is subject to an annual review by Treasury as the model owner together with model validation, and approved by the Risk Committee of the Executive Board via the Treasury Committee.

Frequency of calculation of the bank's IRRBB metrics and description of the specific metrics the bank uses to estimate its sensitivity to IRRBB

Value at risk and capital at risk in the CFO overlay and Treasury position are calculated weekly and monthly and compliance with limits is checked. Monthly reports cover compliance with the stress test requirements. The measure of sensitivity used by Zürcher Kantonalbank is the net present gain or loss for a reduction of one basis point in the interest rate in each maturity band. These key rate sensitivities are calculated for all relevant levels of aggregation, such as the banking book, CFO and Treasury, etc.

Description of the interest rate shock and stress scenarios the bank uses to estimate changes in economic value and earnings

In the net present value perspective, historical and hypothetical scenarios are used to estimate the loss that could result from extreme but plausible macroeconomic stress events. Each scenario is based on the expected performance of market indicators for the scenario in question. In the return perspective, the scenarios are based on historic scenarios observed over a twelve-month period in the past. In addition, the six standardised interest rate shock scenarios in FINMA Circular 2019/2 "Interest rate risk - banks" are used in the net present value perspective and the two parallel standard shock scenarios in the earnings perspective.

Differences between the model assumptions used in the bank's internal interest rate risk measurement system and the model assumptions prescribed for disclosure in Table IRRBB1

No model assumptions used in the bank's internal interest rate risk management to calculate net present value figures (ΔEVE) differ significantly from the model assumptions prescribed for disclosure. In terms of positions included, the following differences occur: unlike for the EVE figure for disclosure, the internal interest rate risk system considers all subordinated bonds (Tier 1 bonds and Tier 2 bonds) and not only Tier 2 bonds alone as interest rate-sensitive funding instruments under bonds and central mortgage institution loans.

Overall description of how the bank hedges its IRRBB and the associated accounting treatment

Contractually agreed client transactions, financial investments and debt financing in the banking book qualify as underlying transactions. Appropriate derivative financial instruments (mainly interest rate swaps) are used to hedge interest rate risk as part of asset-liability management. For each hedging relationship, a review is undertaken to de-ter-mine whether it meets the conditions for the application of hedge accounting (e. g. the hedging transactions must be concluded with an external counterparty). The gain on effective hedging derivatives is recognised in the balance sheet in the settlement account with no income effect. The net balance of the settlement account is included under Other assets or Other liabilities. In the case of ineffective hedging transactions, the excess portion of the derivative is treated as a trading transaction. Refinancing transactions in EUR are fully swapped into Swiss francs in a micro hedge using EUR/CHF cross currency swaps, so the foreign currency risk is fully eliminated.

Description of the main modelling and parameter assumptions used to calculate ΔEVE and ΔNII in table IRRBB1, with reference to the items and currencies shown in table IRRBBA1

1	Change in net present value of capital (ΔEVE)	Calculation of cash flows: Recognition of interest rate margins and other components	Cash flows include principal and interest payments. For all exposures, the main margin payments and credit spread components of the original client transactions are excluded from cash flows, as Zürcher Kantonalbank has implemented a profit-splitting system (internal interest rate perspective) in interest rate management.
2		Mapping: Description of the cash flow mapping used	Cash flows are allocated to maturity bands using the interest rate reset date. For fixed-rate instruments the interest rate reset date for the nominal cash flow is equal to the residual term, but for a money market mortgage it is equal to the residual term of the shorter fixed-rate period agreed. Cash flows on variable products match those on the replicating synthetic fixed-rate products.
3		Discount rates: Description of the (product-specific) discount rates or interpolation assumptions	The CHF yield curve is based on SARON swaps plus a periodically fixed spread, to reflect ZKB's funding conditions on the money and capital markets. The EUR yield curve corresponds to the EURIBOR swap curve and the USD curve to the LIBOR swap curve.

4	Changes to planned income (ΔNII)	Description of the procedure and central assumptions in the model for calculating future income	As part of the steady-state asset-liability assumptions, trans-actions maturing in the next twelve months, with the exception of hedges, are renewed at the same term and volume. For customer transactions, the same margin payments and credit spread components are used as in the original trans-action. When calculating the original margin, no floor is set for negative market interest rates. With variable exposures, maturing replication tranches are renewed in line with the interest rate scenario and the current margin is retained. An internal interest rate forecast is chosen as the bank's basic scenario that corresponds to a constant current yield curve over time.
5	Variable exposures	Description of the procedure and central assumptions and parameters for determining the interest rate reset date and cash flows of variable exposures	Modelling of variable products is based on econometric analyses and expert-based empirical values as regards the setting of conditions and volume trends under interest rate scenarios. As a result, these products, which are not contractually fixed in terms of interest or principal, are replicated by synthetic products with a set fixed term. A key com-ponent of this modelling approach is the definition of a "floor", which can be considered a non-interest-rate-sensitive partial volume in terms of capital commitment. Excess volumes above the floor are modelled using a short-term core/volatile approach.
6	Exposures with repayment options	Description of the assumptions and procedures for recognising behaviour-related early repayment options	Zürcher Kantonalbank currently has no exposures with behaviour-related early repayment options in the banking book.
7	Term deposits	Description of the assumptions and procedures for recognising behaviour-related early withdrawals	Zürcher Kantonalbank offers callable money market deposits with no term agreed for various notice periods (48 hours, 35 days, 95 days). Investment accounts with notice periods of 35 days and 95 days are also offered. The products are treated like fixed deposits based on their first call date, with no behaviour-related modelling.
8	Automatic interest rate options	Description of the assumptions and procedures for recognising automatic, behaviour-independent interest rate options	Zürcher Kantonalbank currently has no automatic, behaviour-independent interest rate options in the banking book.
9	Derivative exposures	Description of purpose, assumptions and procedure for linear and non-linear interest rate derivatives	Zürcher Kantonalbank currently has no non-linear interest rate derivatives in the banking book. Payer/receiver interest rate swaps, cross currency swaps, forward rate agreements and FX swaps are currently used to hedge against interest rate risk in the banking book.

10	Other assumptions	Description of other assumptions and procedures affecting the calculation of figures in Tables IRRBBA1 and IR-RBB1, e.g. aggregation across currencies and correlation assumptions for interest rates	In table IRRBBA1, volumes are shown aggregated across all currencies, for CHF and aggregated for EUR and USD as material currencies.

14.2 IRRBBA1: Interest rate risk: quantitative information on exposure structure and repricing

		Volume (in CHF million)			Average interest rate reset period (in years)		Maximum interest rate reset period for exposures with modeled (not determined) interest rate reset dates (in years)	
31.12.2021		Total	of which in CHF	of which in other significant currencies [1]	Total	of which in CHF	Total	of which in CHF
Defined interest rate reset date	Amounts due from banks	21,104	9,387	11,717	0.07	0.03		
	Amounts due from customers	15,368	12,285	3,027	0.65	0.75		
	Money market mortgage loans	9,745	9,745	–	0.02	0.02		
	Fixed-rate mortgage loans	81,703	81,555	148	3.95	3.96		
	Financial investments	4,385	3,841	544	4.47	4.78		
	Other receivables	1,206	–	1,206	0.01	–		
	Receivables from interest-rate derivatives [2]	32,902	26,796	5,757	1.46	1.27		
	Amounts due to banks	-35,153	-10,917	-21,327	0.15	0.16		
	Amounts due in respect of customer deposits	-11,959	-5,007	-6,875	1.35	0.63		
	Cash bonds	-139	-139	–	3.46	3.46		
	Bond issues and central mortgage institution loans	-32,502	-19,929	-10,969	3.35	5.11		
	Other payables	–	–	–	–	–		
	Payables to interest-rate derivatives [2]	-32,644	-30,902	-1,738	2.22	2.29		
Undefined interest rate reset date	Amounts due from banks	–	–	–	–	–		
	Amounts due from customers	312	222	90	0.09	0.09		
	Mortgage loans with floating rates	309	309	–	1.37	1.37		
	Other receivables on demand	–	–	–	–	–		
	Payables on demand from personal accounts and current accounts	-52,441	-48,193	-4,248	1.82	1.94		
	Other payables on demand	–	–	–	–	–		
	Payables arising from client deposits, terminable but not transferable (savings)	-31,658	-31,658	–	1.89	1.89		
	Total	**-29,462**	**-2,605**	**-22,667**	**2.11**	**2.49**	**10.00**	**10.00**

[1] Currencies comprising more than 10% of balance sheet assets or liabilities (as at 31.12.2021: EUR and USD).

[2] In the case of receivables from and payables to interest rate derivatives, derivatives volumes are shown under both receivables and payables for technical reasons.

14.3 IRRBB1: Interest rate risk: quantitative information on IRRBB

in CHF million	ΔEVE (change in the economic value of equity)		ΔNII (change in net interest income)	
Period	**31.12.2021**	**31.12.2020**	**31.12.2021**	**31.12.2020**
Parallel up	-1,067	-1,279	-53	-105
Parallel down	1,219	1,436	56	145
Steepener [1]	-606	-584		
Flattener [2]	398	335		
Short rate up	-40	-169		
Short rate down	41	173		
Maximum	-1,067	-1,279	-53	-105
Period	**31.12.2021**	**31.12.2020**	**31.12.2021**	**31.12.2020**
Tier 1 capital	13,445	13,195	13,445	13,195

[1] Decrease of short term interest rates in combination with increase of long term interest rates.

[2] Increase of short term interest rates in combination with decrease of long term interest rates.

Measurement, management, monitoring and controlling of interest rate risk in the banking book is not carried out at group level but at the level of the parent company, including the subsidiary Zürcher Kantonalbank Finance (Guernsey) Ltd. The interest rate risk taken by the other group companies is relatively immaterial. Treasury performs a corresponding materiality check of group companies semi-annually. In accordance with margin no. 3 of FINMA Circular 2019/2 "Interest rate risk - banks", Zürcher Kantonalbank has received approval from the auditor. Group rules are also in place on permitted business activity, risk-taking and limits on interest rate positions.

In accordance with FINMA Circular 2019/2 "Interest rate risk - banks", the above scenarios are used in addition to internal scenarios to estimate changes in economic value and income. They form part of the internal interest rate risk measurement system. There were no material changes compared with 31 December 2020.

15 Operational risks

15.1 ORA: Qualitative disclosure requirements related to operational risks

Strategy

The objective of Zürcher Kantonalbank's management of operational risk is the risk-oriented protection of people, information, services and assets, and the maintenance and restoration of critical business functions in an operational emergency. The management of operational risk is therefore an essential part, ensuring that the canton, clients, partners, public and regulator have confidence in the bank. The assessment of operational risks takes account of both direct financial losses and the consequences of a loss of client confidence and reputation.

Organisation and processes

The corresponding risk inventory constitutes the basis for the management of operational risks. Besides periodic and systematic assessments, operational risks are assessed, managed and monitored on an event-driven basis as well. Operational risks are divided into six topics: cyber risks, other external tort risks, internal tort risks, expert and model risks, process risks, and environmental and accident risks.

The risk organisation reviews the management of operational risks in an annual structured process. The principles governing the management of operational risks require, among other things, that operational risks are measured and managed based on uniform, binding objectives, and that they are accepted and controlled sustainably in a reasonable relationship to the bank's risk capacity. The Risk unit specifies the processes and methods, and provides tools for monitoring the internal control system.

The measurement of operational risks is based on an estimate of potential claims and the probability of occurrence. To calculate the operational residual risks, inherent risks are set against existing risk-mitigating measures. If the re-

sidual risks exceed the risk tolerance, additional risk-mitigating measures are defined and implemented. The adequacy and effectiveness of the risk-mitigating measures are monitored as part of the bank-wide internal control system (ICS). An appropriate and effective ICS ensures that losses from operational risks remain low.

In terms of security, the specialist unit in the IT, Operations & Real Estate business unit has group-wide responsibility for setting rules. As the unit for preventive risk management, the specialist unit sets the security rules for individuals, systems and procedures. The greater the risk or risk classification, the more extensive the security rules that have to be implemented. The specialist unit for security supports line managers where required, providing advice on implementing technical security requirements. It also provides training and raises staff awareness of rules of conduct relating to security (security awareness).

Risk profile

The bank's risk profile for operational risks did not change materially compared with the previous year. The risk ratings of the six OpRisk topics were confirmed. The planned measures to manage the operational risk profile are appropriate.

As society and the economy continue to become digitally connected, external and internal process and cyber risks remain high. Cyber and process risks remain the two OpRisk topics with the greatest residual risk for the bank. The management of these risks therefore continues to receive a high degree of attention.

The bank is addressing the challenging environment and dynamics related to cyber risks by taking various risk mitigation measures. The need to implement additional measures is evaluated on an ongoing basis. Their implementation is based on structured planning. This ensures that the bank's security posture takes into account the requirements of increasing interconnectedness and that the relevant dimensions (identification, protection, detection, response and recovery) are managed. Employees are continuously trained to make them aware of cyber risks and thus to establish and promote a cyber risk culture in the bank.

Risk management of process risks is primarily performed by the process owners. In addition, preventive risk management and the Risk unit prepare risk assessments of the process chains in an end-to-end process context. When doing so, special attention is paid to the interfaces in the process flows and operational resilience is taken into account. Where possible and reasonable, execution errors are avoided by using control activities focused on anomaly detection. The plans for resuming normal operations of critical business processes in the event of an operational crisis (business continuity plans) are regularly reviewed and tested during emergency exercises. The critical business processes according to the business impact analysis as well as the business continuity plans are part of Zürcher Kantonalbank's business continuity management as implemented in accordance with regulatory requirements.

The pandemic scenario, which is assigned to the OpRisk topic area "environmental and accident risks", can develop into a business continuity management (BCM) event under very unfavourable circumstances, i. e. if a critical number of employees in critical processes are absent. Despite the ongoing pandemic, no such absences occurred in 2021. The Pandemic Task Force, as the preliminary stage of the emergency organisation, remains active. Working in close cooperation with the Executive Board while keeping a close eye on the latest developments, far-reaching measures were taken not only to protect the bank's clients and employees, but also to guarantee that banking operations would remain intact at all times. The pandemic was and is an additional burden for Zürcher Kantonalbank's operations. But thanks to the crisis organisation in the various areas and the great commitment of its employees, Zürcher Kantonalbank in 2021 suffered no significant business interruptions due to the pandemic.

Approach regarding capital adequacy requirements for operational risk

Zürcher Kantonalbank uses the basic indicator approach to determine the capital requirement for operational risks.

16 Disclosure requirements for systemically important banks

Special disclosure obligations for systemically important financial groups and banks

Zürcher Kantonalbank has been deemed a domestic systemically important bank since November 2013.

16.1 Annex 3: Risk-based capital requirements based on capital ratios (group and parent company)

31.12.2021				Group
in CHF million and in % RWA	**Transitional rules**		**Definitive rules from 2026**	
Basis of assessment	**CHF million**		**CHF million**	
Risk-weighted assets (RWA)	**71,553**		**71,553**	
Risk-based capital requirements (going concern) based on capital ratios	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Total [1]	**9,207**	**12.9%**	**9,207**	**12.9%**
of which CET1: minimum capital	3,220	4.5%	3,220	4.5%
of which CET1: buffer capital	2,905	4.1%	2,905	4.1%
of which CET1: countercyclical buffer	6	0.0%	6	0.0%
of which Additional Tier 1: minimum capital	2,504	3.5%	2,504	3.5%
of which Additional Tier 1: buffer capital	572	0.8%	572	0.8%
Eligible capital (going concern)	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Core capital	**13,253**	**18.5%**	**12,512**	**17.5%**
of which CET1	10,066	14.1%	9,325	13.0%
of which CET1 to cover additional Tier 1 requirements	2,121	3.0%	2,862	4.0%
of which additional Tier 1 high-trigger CoCos	1,065	1.5%	324	0.5%
of which additional Tier 1 low-trigger CoCos	–	–	–	–
of which Tier 2 high-trigger CoCos [2]				
of which Tier 2 low-trigger CoCos [2]				
Risk-based requirements for additional loss-absorbing capital (gone concern) based on capital ratios	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Total according to size and market share (mirroring going concern requirements) incl. additional requirement FINMA [3, 4]	2,099	2.9%	5,624	7.9%
Reduction based on rebates as per Art. 133 CAO	–	–	–	–
Reduction based on holdings in additional capital in the form of CET1 or contingent capital as per Art. 132 para. 4 CAO	–	–	-370	-0.5%
Total (net)	**2,099**	**2.9%**	**5,254**	**7.3%**
Eligible additional loss-absorbing capital (gone concern)	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Total	**2,860**	**4.0%**	**5,472**	**7.6%**
of which CET1 used to meet gone concern requirements	–	–	–	–
of which additional Tier 1 used to meet gone concern requirements	–	–	741	1.0%
of which Tier 2 high-trigger CoCos	–	–	–	–
of which Tier 2 low-trigger CoCos [2]	516	0.7%	516	0.7%
of which non-Basel III compliant Tier 1	–	–	–	–
of which non-Basel III compliant Tier 2	–	–	–	–
of which bail-in bonds	–	–	–	–
of which other eligible additional loss-absorbing capital [5]	1,000	1.4%	1,000	1.4%
of which surplus value adjustments under the IRB approach [6]	294	0.4%	294	0.4%
of which state guarantee or similar mechanism	1,050	1.5%	2,921	4.1%

[1] The risk-based capital requirements on a going concern basis are calculated as a percentage of risk-weighted exposures (RWA). Under Article 129 CAO, the total risk-based requirement for Zürcher Kantonalbank is 12.86%. The countercyclical buffer (CCB) under Art. 44 CAO was discontinued as at 27.03.2020. However, the CCB is being reactivated as at 30.09.2022 by decision of the Federal Council dated 26.01.2022. The extended countercyclical buffer (eCCB) under Art. 44a CAO applied to Zürcher Kantonalbank for the first time as at 31.12.2021. The requirement as at 31.12.2021 from the eCCB is 0.01% of RWA. As at 31.12.2021 this results in a risk-based total requirement (going concern) of 12.87%.

[2] With effect from 01.01.2020, Tier 2 capital with a low trigger only qualifies as eligible additional loss-absorbing capital (gone concern).

[3] Under Article 132, para. 2 CAO, the risk-based requirements for additional loss-absorbing capital (gone concern) are calculated using the total going concern requirement under Article 129 CAO. Based on the transitional provisions in Article 148j CAO, the gross gone concern requirement in 2021 is 1.92% of RWA. This will increase in stages until 2026, when the gross gone concern requirement will be equal to 40 percent of the total going concern requirement for Zürcher Kantonalbank (excluding the CCB).

[4] In a letter dated 03.09.2019, FINMA set the risk-based requirements for additional loss-absorbing capital (gone concern) for contingency planning at Zürcher Kantonalbank at 7.86% gross from 2026, including the total according to size and market share (mirroring the going concern requirement). Under the transitional provisions in Art. 148j CAO, this is equivalent to an additional risk-based requirement of 1.01% gross as at 31.12.2021. This results in a total risk-based gone concern requirement of 2.93% gross as at 31.12.2021. The total risk-based gone concern requirement is being increased gradually to 7.86% by 2026, as already mentioned.

[5] By resolution of the cantonal parliament, the endowment capital reserve (CHF 1,000 million) was reserved in full for the Bank's contingency planning and accordingly qualifies as eligible additional loss-absorbing capital on a gone concern basis. As a result, the endowment capital reserve can now only be called on by order of FINMA or a FINMA-appointed restructuring official.

[6] Zürcher Kantonalbank adopted the rules on value adjustments (VA) and provisions (P) for expected losses (EL) on 01.01.2021. The portion of the VA and P for EL that exceeds expected losses calculated under the IRB approach qualifies as eligible additional loss-absorbing capital (gone concern).

31.12.2021			Parent company	
in CHF million and in % RWA	**Transitional rules**		**Definitive rules from 2026**	
Basis of assessment	**CHF million**		**CHF million**	
Risk-weighted assets (RWA)	**72,280**		**72,280**	
Risk-based capital requirements (going concern) based on capital ratios	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Total [1]	**9,301**	**12.9%**	**9,301**	**12.9%**
of which CET1: minimum capital	3,253	4.5%	3,253	4.5%
of which CET1: buffer capital	2,935	4.1%	2,935	4.1%
of which CET1: countercyclical buffer	6	0.0%	6	0.0%
of which Additional Tier 1: minimum capital	2,530	3.5%	2,530	3.5%
of which Additional Tier 1: buffer capital	578	0.8%	578	0.8%
Eligible capital (going concern)	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Core capital	**13,445**	**18.6%**	**12,701**	**17.6%**
of which CET1	10,255	14.2%	9,511	13.2%
of which CET1 to cover additional Tier 1 requirements	2,125	2.9%	2,869	4.0%
of which additional Tier 1 high-trigger CoCos	1,065	1.5%	321	0.4%
of which additional Tier 1 low-trigger CoCos	–	–	–	–
of which Tier 2 high-trigger CoCos [2]				
of which Tier 2 low-trigger CoCos [2]				
Risk-based requirements for additional loss-absorbing capital (gone concern) based on capital ratios	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Total according to size and market share (mirroring going concern requirements) incl. additional requirement FINMA [3, 4]	2,121	2.9%	5,681	7.9%
Reduction based on rebates as per Art. 133 CAO	–	–	–	–
Reduction based on holdings in additional capital in the form of CET1 or contingent capital as per Art. 132 para. 4 CAO	–	–	-372	-0.5%
Total (net)	**2,121**	**2.9%**	**5,309**	**7.3%**
Eligible additional loss-absorbing capital (gone concern)	**CHF million**	**in % RWA**	**CHF million**	**in % RWA**
Total	**2,868**	**4.0%**	**5,477**	**7.6%**
of which CET1 used to meet gone concern requirements	–	–	–	–
of which additional Tier 1 used to meet gone concern requirements	–	–	744	1.0%
of which Tier 2 high-trigger CoCos	–	–	–	–
of which Tier 2 low-trigger CoCos [2]	516	0.7%	516	0.7%
of which non-Basel III compliant Tier 1	–	–	–	–
of which non-Basel III compliant Tier 2	–	–	–	–
of which bail-in bonds	–	–	–	–
of which other eligible additional loss-absorbing capital [5]	1,000	1.4%	1,000	1.4%
of which surplus value adjustments under the IRB approach [6]	292	0.4%	292	0.4%
of which state guarantee or similar mechanism	1,060	1.5%	2,924	4.0%

[1] The risk-based capital requirements on a going concern basis are calculated as a percentage of risk-weighted exposures (RWA). Under Article 129 CAO, the total risk-based requirement for Zürcher Kantonalbank is 12.86%. The countercyclical buffer (CCB) under Art. 44 CAO was discontinued as at 27.03.2020. However, the CCB is being reactivated as at 30.09.2022 by decision of the Federal Council dated 26.01.2022. The extended countercyclical buffer (eCCB) under Art. 44a CAO applied to Zürcher Kantonalbank for the first time as at 31.12.2021. The requirement as at 31.12.2021 from the eCCB is 0.01% of RWA. As at 31.12.2021 this results in a risk-based total requirement (going concern) of 12.87%.

[2] With effect from 01.01.2020, Tier 2 capital with a low trigger only qualifies as eligible additional loss-absorbing capital (gone concern).

[3] Under Article 132, para. 2 CAO, the risk-based requirements for additional loss-absorbing capital (gone concern) are calculated using the total going concern requirement under Article 129 CAO. Based on the transitional provisions in Article 148j CAO, the gross gone concern requirement in 2021 is 1.92% of RWA. This will increase in stages until 2026, when the gross gone concern requirement will be equal to 40 percent of the total going concern requirement for Zürcher Kantonalbank (excluding the CCB).

[4] In a letter dated 03.09.2019, FINMA set the risk-based requirements for additional loss-absorbing capital (gone concern) for contingency planning at Zürcher Kantonalbank at 7.86% gross from 2026, including the total according to size and market share (mirroring the going concern requirement). Under the transitional provisions in Art. 148j CAO, this is equivalent to an additional risk-based requirement of 1.01% gross as at 31.12.2021. This results in a total risk-based gone concern requirement of 2.93% gross as at 31.12.2021. The total risk-based gone concern requirement is being increased gradually to 7.86% by 2026, as already mentioned.

[5] By resolution of the cantonal parliament, the endowment capital reserve (CHF 1,000 million) was reserved in full for the Bank's contingency planning and accordingly qualifies as eligible additional loss-absorbing capital on a gone concern basis. As a result, the endowment capital reserve can now only be called on by order of FINMA or a FINMA-appointed restructuring official.

[6] Zürcher Kantonalbank adopted the rules on value adjustments (VA) and provisions (P) for expected losses (EL) on 01.01.2021. The portion of the VA and P for EL that exceeds expected losses calculated under the IRB approach qualifies as eligible additional loss-absorbing capital (gone concern).

16.2 Annex 3: Unweighted capital requirements based on the leverage ratio (group and parent company)

31.12.2021				Group
in CHF million and in % LRD	**Transitional rules**		**Definitive rules from 2026**	
Basis of assessment	**CHF million**		**CHF million**	
Leverage ratio exposure measure (leverage ratio denominator, LRD)	**212,425**		**212,425**	
Unweighted capital requirements (going concern) based on the leverage ratio	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Total [1]	**9,559**	**4.5%**	**9,559**	**4.5%**
of which CET1: minimum capital	3,186	1.5%	3,186	1.5%
of which CET1: buffer capital	3,186	1.5%	3,186	1.5%
of which Additional Tier 1: minimum capital	3,186	1.5%	3,186	1.5%
Eligible capital (going concern)	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Core capital	**13,253**	**6.2%**	**12,512**	**5.9%**
of which CET1	10,066	4.7%	9,325	4.4%
of which CET1 to cover additional Tier 1 requirements	2,121	1.0%	2,862	1.3%
of which additional Tier 1 high-trigger CoCos	1,065	0.5%	324	0.2%
of which additional Tier 1 low-trigger CoCos	–	–	–	–
of which Tier 2 high-trigger CoCos [2]				
of which Tier 2 low-trigger CoCos [2]				
Unweighted requirements for additional loss-absorbing capital (gone concern) based on the leverage ratio	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Total according to size and market share (mirroring going concern requirements) incl. additional requirement FINMA [3, 4]	2,045	1.0%	5,842	2.8%
Reduction based on rebates as per Art. 133 CAO	–	–	–	–
Reduction based on holdings in additional capital in the form of CET1 or contingent capital as per Art. 132 para. 4 CAO	–	–	-370	-0.2%
Total (net)	**2,045**	**1.0%**	**5,472**	**2.6%**
Eligible additional loss-absorbing capital (gone concern)	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Total	**2,860**	**1.3%**	**5,472**	**2.6%**
of which CET1 used to meet gone concern requirements	–	–	–	–
of which additional Tier 1 used to meet gone concern requirements	–	–	741	0.3%
of which Tier 2 high-trigger CoCos	–	–	–	–
of which Tier 2 low-trigger CoCos [2]	516	0.2%	516	0.2%
of which non-Basel III compliant Tier 1	–	–	–	–
of which non-Basel III compliant Tier 2	–	–	–	–
of which bail-in bonds	–	–	–	–
of which other eligible additional loss-absorbing capital [5]	1,000	0.5%	1,000	0.5%
of which surplus value adjustments under the IRB approach [6]	294	0.1%	294	0.1%
of which state guarantee or similar mechanism	1,050	0.5%	2,921	1.4%

[1] The unweighted capital requirements (going concern) are calculated as a percentage of the leverage ratio exposure measure. Under Article 129 CAO, the unweighted total requirement for Zürcher Kantonalbank is 4.5%.

[2] With effect from 01.01.2020, Tier 2 capital with a low trigger only qualifies as eligible additional loss-absorbing capital (gone concern).

[3] Under Article 132, para. 2 CAO, the unweighted requirements for additional loss-absorbing capital (gone concern) are calculated using the total going concern requirement under Article 129 CAO. Based on the transitional provisions in Article 148j CAO, the gross gone concern requirement in 2021 is 0.63% of the leverage ratio exposure measure. This will increase in stages until 2026, when the gross gone concern requirement will be equal to 40 percent of the total going concern requirement for Zürcher Kantonalbank.

[4] In a letter dated 03.09.2019, FINMA increased the unweighted requirements for additional loss-absorbing capital (gone concern) for contingency planning at Zürcher Kantonalbank from 2026 in the same ratio as for the risk-based gone concern requirements. Under the transitional provisions in Art. 148j CAO, this is equivalent to an additional unweighted requirement of 0.33% gross as at 31.12.2021. This results in a total unweighted gone concern requirement of 0.96% gross as at 31.12.2021. The total unweighted gone concern requirement is being increased gradually to 2.75% gross by 2026.

[5] By resolution of the cantonal parliament, the endowment capital reserve (CHF 1,000 million) was reserved in full for the Bank's contingency planning and accordingly qualifies as eligible additional loss-absorbing capital on a gone concern basis. As a result, the endowment capital reserve can now only be called on by order of FINMA or a FINMA-appointed restructuring official.

[6] Zürcher Kantonalbank adopted the rules on value adjustments (VA) and provisions (P) for expected losses (EL) on 01.01.2021. The portion of the VA and P for EL that exceeds expected losses calculated under the IRB approach qualifies as eligible additional loss-absorbing capital (gone concern).

31.12.2021			Parent company	
in CHF million and in % LRD	**Transitional rules**		**Definitive rules from 2026**	
Basis of assessment	**CHF million**		**CHF million**	
Leverage ratio exposure measure (leverage ratio denominator, LRD)	**212,654**		**212,654**	
Unweighted capital requirements (going concern) based on the leverage ratio	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Total [1]	**9,569**	**4.5%**	**9,569**	**4.5%**
of which CET1: minimum capital	3,190	1.5%	3,190	1.5%
of which CET1: buffer capital	3,190	1.5%	3,190	1.5%
of which Additional Tier 1: minimum capital	3,190	1.5%	3,190	1.5%
Eligible capital (going concern)	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Core capital	**13,445**	**6.3%**	**12,701**	**6.0%**
of which CET1	10,255	4.8%	9,511	4.5%
of which CET1 to cover additional Tier 1 requirements	2,125	1.0%	2,869	1.3%
of which additional Tier 1 high-trigger CoCos	1,065	0.5%	321	0.2%
of which additional Tier 1 low-trigger CoCos	–	–	–	–
of which Tier 2 high-trigger CoCos [2]				
of which Tier 2 low-trigger CoCos [2]				
Unweighted requirements for additional loss-absorbing capital (gone concern) based on the leverage ratio	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Total according to size and market share (mirroring going concern requirements) incl. additional requirement FINMA [3, 4]	2,047	1.0%	5,849	2.8%
Reduction based on rebates as per Art. 133 CAO	–	–	–	–
Reduction based on holdings in additional capital in the form of CET1 or contingent capital as per Art. 132 para. 4 CAO	–	–	-372	-0.2%
Total (net)	**2,047**	**1.0%**	**5,477**	**2.6%**
Eligible additional loss-absorbing capital (gone concern)	**CHF million**	**in % LRD**	**CHF million**	**in % LRD**
Total	**2,868**	**1.3%**	**5,477**	**2.6%**
of which CET1 used to meet gone concern requirements	–	–	–	–
of which additional Tier 1 used to meet gone concern requirements	–	–	744	0.4%
of which Tier 2 high-trigger CoCos	–	–	–	–
of which Tier 2 low-trigger CoCos [2]	516	0.2%	516	0.2%
of which non-Basel III compliant Tier 1	–	–	–	–
of which non-Basel III compliant Tier 2	–	–	–	–
of which bail-in bonds	–	–	–	–
of which other eligible additional loss-absorbing capital [5]	1,000	0.5%	1,000	0.5%
of which surplus value adjustments under the IRB approach [6]	292	0.1%	292	0.1%
of which state guarantee or similar mechanism	1,060	0.5%	2,924	1.4%

[1] The unweighted capital requirements (going concern) are calculated as a percentage of the leverage ratio exposure measure. Under Article 129 CAO, the unweighted total requirement for Zürcher Kantonalbank is 4.5%.

[2] With effect from 01.01.2020, Tier 2 capital with a low trigger only qualifies as eligible additional loss-absorbing capital (gone concern).

[3] Under Article 132, para. 2 CAO, the unweighted requirements for additional loss-absorbing capital (gone concern) are calculated using the total going concern requirement under Article 129 CAO. Based on the transitional provisions in Article 148j CAO, the gross gone concern requirement in 2021 is 0.63% of the leverage ratio exposure measure. This will increase in stages until 2026, when the gross gone concern requirement will be equal to 40 percent of the total going concern requirement for Zürcher Kantonalbank.

[4] In a letter dated 03.09.2019, FINMA increased the unweighted requirements for additional loss-absorbing capital (gone concern) for contingency planning at Zürcher Kantonalbank from 2026 in the same ratio as for the risk-based gone concern requirements. Under the transitional provisions in Art. 148j CAO, this is equivalent to an additional unweighted requirement of 0.33% gross as at 31.12.2021. This results in a total unweighted gone concern requirement of 0.96% gross as at 31.12.2021. The total unweighted gone concern requirement is being increased gradually to 2.75% gross by 2026.

[5] By resolution of the cantonal parliament, the endowment capital reserve (CHF 1,000 million) was reserved in full for the Bank's contingency planning and accordingly qualifies as eligible additional loss-absorbing capital on a gone concern basis. As a result, the endowment capital reserve can now only be called on by order of FINMA or a FINMA-appointed restructuring official.

[6] Zürcher Kantonalbank adopted the rules on value adjustments (VA) and provisions (P) for expected losses (EL) on 01.01.2021. The portion of the VA and P for EL that exceeds expected losses calculated under the IRB approach qualifies as eligible additional loss-absorbing capital (gone concern).

17 Corporate Governance

For disclosures on corporate governance, please see the corporate governance section in our Annual Report 2021 or the corporate governance information our internet page.

18 Climate-related financial risks

18.1 Introduction and general

Climate change is altering our environment in many ways. Not only the natural environment is affected, but our economic and social environment too. This change poses major challenges for the economy as a whole, and hence also for banks. All are called upon to do their part to limit climate change and take responsibility for preserving natural resources for future generations. The nature of banking operations means that banks - among them Zürcher Kantonalbank - do not rank among those industries which have high CO_2 emissions. Banks have an important role to play in shaping a climate-friendly economy because of their position as financial intermediaries.

In risk management, integrated treatment of climate-related financial risks ("climate risks" for short) helps protect clients' assets and those of the bank over the long term. The public service mandate set down in the purpose clause of the Cantonal Bank Act of the Canton of Zurich requires Zürcher Kantonalbank to pursue a sustainable business policy. Conscious management of climate risks is an integral part of sustainability.

As part of the annual reporting, this section of the disclosure explains how Zürcher Kantonalbank deals with climate-related financial risks. The disclosure is made in accordance with the requirements of FINMA Circular 2016/1 "Disclosure – Banks" and follows the recommendations of the Task Force on Climate Related Financial Disclosure (TCFD), which have become the global disclosure standard. The transition to a more climate-friendly economy presents both opportunities and risks for Zürcher Kantonalbank. This disclosure focuses on the risks.

It is addressed to all interested parties. These include, in particular, the residents of the Canton of Zurich, the clients of Zürcher Kantonalbank, the authorities and supervisory bodies, rating agencies and investors.

The disclosure covers all significant activities of the group. In accordance with FINMA requirements, it is being carried out for the first time as at 31 December 2021.

18.2 Key features of the governance structure

Zürcher Kantonalbank strongly believes that sustainability is a key factor for success. For Zürcher Kantonalbank, sustainability means making successful economic activity permanently compatible with responsibility for the environment and society. Zürcher Kantonalbank is guided by the United Nations' 17 Sustainable Development Goals (SDGs) and greenhouse gas neutrality by 2050. Climate and climate risks are part of the environmental aspect of sustainability.

Sustainable business also means systematically integrating risks and opportunities in environmental, social and governance (ESG) fields into our business activities (ESG integration). The disclosure requirements are limited to climate-related financial risks.

18.2.1 Legal mandate, strategy and sustainability policy

According to the purpose article of the Zürcher Kantonalbank Act (Clause 2 "Purpose"), "The purpose of Zürcher Kantonalbank (the Bank) is to contribute to resolving economic and social tasks in the canton. It supports environmentally sustainable development in the canton." Hence, Zürcher Kantonalbank's broad commitment to various areas of sustainability, including the climate, is supported by its legal mandate.

The guidelines issued by the Board of Directors on fulfilling the public service mandate of Zürcher Kantonalbank state: "In fulfilling its public service mandate, Zürcher Kantonalbank, as a universal bank, shall observe the principles of sustainability and the recognised rules of risk management." As the core task of Zürcher Kantonalbank's business activities, the public service mandate is reflected in the mission statement, the group strategy and the strategies of the individual business units. These guidelines define governance, in particular the broad anchoring of sustainability in all business units - vertically and horizontally. The Committee of the Board is assisted in performing its service mandate by a specialist unit and a specialist committee, the Service Mandate Steering Committee (SALA), whose tasks are described below.

According to the group strategy, Zürcher Kantonalbank aims to "actively shape sustainability topics, lead the way in sustainable offerings and accompany clients on the path to a more sustainable future."

The sustainability policy fleshes out the sustainability ambition of Zürcher Kantonalbank. It summarises the impact areas and role of Zürcher Kantonalbank and formulates targets - specific goals and exclusions along the dimensions of environment, society and governance - to be implemented in the various business areas. Zürcher Kantonalbank focuses on areas where there is great potential for impact. It aims to steadily improve the sustainability impact of its business activities. Appropriate targets are set for this. Reporting on actions taken and targets achieved is transparent and based on the reporting guidelines of the Global Reporting Initiative (GRI).

Zürcher Kantonalbank is committed to minimising climate risks across all its operations and providing transparency in this regard. In doing so, it is guided by the recommendations of the Task Force on Climate Related Financial Disclosure (TCFD). The climate ambition is guided by the goals of the Paris Climate Agreement and of greenhouse gas neutrality by 2050. Zürcher Kantonalbank contributes to climate change mitigation by promoting energy efficiency and the substitution of fossil fuels with renewable energy sources.

In its financing business, Zürcher Kantonalbank specifically promotes sustainable developments in energy, mobility and buildings. In energy sector financing, Zürcher Kantonalbank is committed to further increasing the efficiency of facilities and gradually shifting to renewable energy sources. Zürcher Kantonalbank advocates sustainable mobility concepts and supports innovative projects. Biofuels are only supported if they are produced from agricultural and forestry residues and biogenic waste and do not compete with food production. Zürcher Kantonalbank creates incentives for its clients to build, modernise and operate their properties and infrastructure in the most environmentally friendly and energy-efficient way possible. To this end, the range of products and services is being continuously expanded. Zürcher Kantonalbank explicitly rules out directly financing the following types of business:

- Fossil fuels: Coal mining, oil and gas production: as a regionally-based bank, Zürcher Kantonalbank has never financed coal mining or the extraction of oil or natural gas, and it is accordingly not involved in controversial oil and gas extraction processes.
- Fossil fuel power plants: power plants fuelled by coal or oil are not financed.
- Commodity trading: coal for electricity production (thermal coal) and crude and fuel oil are explicitly excluded.
- Nuclear power: new financing for the development and construction or modernisation of nuclear power plants, other than for the purpose of maintaining safety, and firms whose predominant business activity is producing, trading and marketing nuclear energy and/or reprocessing nuclear fuel and uranium enrichment plants are excluded. Financing of uranium mining is also excluded.

In its investment business, Zürcher Kantonalbank is guided by the six United Nations Principles for Responsible Investment (UN PRI). In wealth management and investment advice, the sustainability preferences of clients are systematically investigated. Zürcher Kantonalbank integrates ESG risks and opportunities into the investment process for all investment solutions and provides clients with comprehensive and transparent information on ESG ratings.

The Asset Management business of Zürcher Kantonalbank has committed to a quantitative reduction path in CO_2 equivalents[1] (CO_2e) for all active investment solutions in traditional asset classes for Swisscanto investment funds, thus making a concrete contribution to achieving the goals of the Paris Climate Agreement. To this end, a science-based annual CO_2e reduction target of at least four percent (2-degree climate target) is set for all active investment solutions.

[1] CO_2 equivalents (CO_2e) are a unit of measurement used to standardise the climate impact of the greenhouse gases carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated greenhouse gases (CFCs). All these gases linger in the atmosphere for different lengths of time and do not contribute to the greenhouse effect to the same extent.

In the capital markets business, Zürcher Kantonalbank helps clients issue green bonds. It also issues green bonds itself to fund environmental loans and finance projects with energy objectives in the office buildings used by Zürcher Kantonalbank.

As part of its corporate environmental programme, Zürcher Kantonalbank sets goals to reduce CO_2e emissions in its own operations. The achievement of objectives is reviewed annually. Unavoidable remaining CO_2e emissions have been 100 percent offset since 2009, preferably in Switzerland with projects in the Greater Zurich Area. This means that the operations of Zürcher Kantonalbank have been climate-neutral since 2009.

Zürcher Kantonalbank promotes renewable energy and energy efficiency through specific sponsorship engagement.

18.2.2 Board of Directors

As the governing body, the Board of Directors defines the group mission statement and the group strategy, which contain the above elements concerning sustainability.

18.2.3 Executive Board

The Executive Board (EB) is responsible for setting the various business policies. In the sustainability policy, the Executive Board explicitly addresses the climate issue and sets out how Zürcher Kantonalbank wishes to promote the issue of sustainability in its business operations. The lending policy is aligned with the sustainability policy and sets out the principles for the lending business in concrete terms, for example by excluding financing for certain sectors or product categories. The policy for the investment and wealth management business (IWM) is based on the sustainability policy.

The Public Service Mandate unit is responsible for planning, implementing, refining, monitoring and communicating the public service mandate. The public service mandate includes the sustainability mandate, which covers the climate issue.

18.2.4 Boards and committees

Service Mandate Steering Committee (SALA): The Committee of the Board is assisted in performing its duties by a specialist committee consisting of representatives of all business units. This specialist committee advises and supports the Committee of the Board and the Board of Directors in all matters relating to the public service mandate. The CFO chairs the committee, and the public service mandate specialist is deputy chairperson. This person plans and coordinates the meetings in conjunction with the chairperson. The other representatives on the Service Mandate Steering Committee are managers from all the business units.

The Risk Committee of the Executive Board supports the Executive Board in designing the bank's risk management, in particular defining the procedures to identify, assess, manage, run and monitor credit, market, liquidity and operational risks, as well as reputational and compliance risks, and takes decisions within the scope of the powers delegated by the Executive Board.

The Conflicts Committee assists the Executive Board in handling transactions that entail particular business policy risks, conflicts of interest or particular effects on the reputation of Zürcher Kantonalbank.

18.2.5 Significance of group companies for climate-related financial risks

Both the balance sheet and the income statement of the Zürcher Kantonalbank group are dominated by the parent company. The business areas of the fully consolidated subsidiaries are either those that are also operated to a significantly greater extent by the parent company (e. g. private banking) or are complementary activities such as fund management by Swisscanto or the issue of structured products by Zürcher Kantonalbank Finance (Guernsey) Ltd. Consequently, the companies outside the parent company have very little influence on the risk assessment of climate-related financial risks at group level. As a result, disclosure in this regard focuses strongly on the activities of the parent company and is supplemented by elements from the subsidiaries if these are significant.

- Swisscanto: the Swisscanto Group is one of the leading Swiss providers of sustainable investment solutions. As a fund provider, Swisscanto has set itself an annual CO_2e reduction target of at least 4 percent in all active investment funds, engages in dialogue with investee companies and actively exercises voting rights. The assessment of aspects of climate-related financial risks and the description of the most important risk management processes from Asset Management contained in this disclosure cover the activities of the Swisscanto companies.
- The Zürcher Kantonalbank Österreich AG business segment focuses on the investment and wealth management business. This is a business area in which the parent company is also active, and to a much greater extent. Zürcher Kantonalbank Österreich AG has set its strategy for dealing with sustainability risks and published it in line with the locally applicable regulations. In the advisory process, Zürcher Kantonalbank Österreich AG provides clients with information about the product manufacturer's sustainability risks and explains it. The client is informed about the expected impact of sustainability risks on the return of the financial products offered. Zürcher Kantonalbank Österreich AG has no material influence on the assessment of the group's climate-related financial risks.
- The business area of Zürcher Kantonalbank Finance (Guernsey) Ltd. is limited to issuing structured investment products; the business area of ZKB Securities (UK) Ltd. is limited to equity brokerage and research services for professional clients. No climate-related financial risks arise from the on-site operations in Guernsey and London that significantly increase or reduce the group's risk profile. The business activities of the two companies were taken into account in the assessment of the parent company's trading business.

18.3 Description of short, medium and long-term climate-related financial risks

18.3.1 Principles of risk description

Assessing climate-related financial risks ("climate risks" in short) is a major challenge for a number of reasons. Firstly, climate risks are a risk driver in the traditional risk categories such as credit and market risks, which is why climate risks are primarily managed within the traditional risk categories. Obviously, though, the procedures for identifying and measuring climate risks are not as established as, for example, the procedures for managing credit or market risks. Secondly, a very long-term view is necessary: Climate change as a risk factor moves relatively slowly in one direction or the other. After all, over a long period, not only will the climate change but Zürcher Kantonalbank will too. For these reasons, assessing climate risks is fraught with uncertainty, and a qualitative assessment of risks is essential to gain a meaningful picture of the risk profile.

Uncertainty in assessing climate-related financial risks increases with the observation horizon. No risks have been identified that behave in the opposite way, i. e. that are smaller in the long term than in the medium term. For the following description of climate-related financial risks, the medium and long-term views are therefore combined and referred to as the "long-term view", which means in roughly five to thirty years' time.

18.3.2 Distinguishing between physical risks and transition risks

There is little doubt that most of the global warming observed in recent decades is caused or amplified by humans and that it will continue. The negative side effects of global warming include an increase in extreme weather events such as heavy rain, floods and storms, rising sea levels and changing climatic conditions in different regions. These direct consequences of climate change result in what are known as physical risks. Physical risks can be either one-time (acute) or recurring (chronic). As climate change progresses, physical risks are expected to increase over time.

The second type of risk from climate risks is transition risks. These are risks resulting from the transformation to a low-carbon economy. Transition risks are further divided into:

- political/legal and regulatory risks from changes in the legal or regulatory framework that have a negative impact on the bank's own business activities or entail high implementation costs,
- technological risks such as risks from innovations that make technologies previously used obsolete, resulting in a loss of value for the corresponding investments,
- Market risks from changes in client preferences,
- Reputational risks from changing stakeholder demands on the company.

There is a link between physical and transition risks: the faster the emission reduction (the achievement of climate targets), the lower the expected physical risks. On the other hand, transition risks increase, especially in the event of a disorderly transition to a low-carbon economy.

18.3.3 Description of climate-related financial risks for Zürcher Kantonalbank

18.3.3.1 Summary

Climate protection is a central theme in Zürcher Kantonalbank's sustainability mission. Climate-related financial risks influence the risk profile, but are not among the top risks.

The key drivers of transition risks for the bank are climate legislation, changing client preferences and public perception. Potentially more affected by this are:

- The investment and wealth management business, offering more climate-friendly products.
- The lending business, where future changes in legislation may affect the valuation of collateral (properties in the mortgage portfolio) and financing of ventures in climate-exposed sectors.

Physical climate risks are of much less importance to the risk profile than transition risks. Potentially affected by physical climate risks are:

- The mortgage portfolio: the value of individual properties in the mortgage portfolio could be reduced as a result of flooding or landslides, for example.
- Banking operations: greater frequency of extreme weather events could impact bank operations in a very adverse flooding scenario.

The following table shows an overview of the 2021 risk assessment, which is then explained in detail below. The classification is based on the traditional risk categories, with compliance risks from the investment business being subsumed under business risks.

Overview from the qualitative assessment of climate-related financial risks 2021

	Physical risks		Transition risks	
Area	short term	med. term - long term	short term	med. term - long term
Operational risks: Banking operations	■	■	■	■
Credit risks: Financing business	■	■■	■■	■■■
Market risks: Trading and Treasury	■	■	■	■■
Business risks: Wealth & Asset Management business	■	■■	■■	■■

■ = low risk, ■■■■■ = high risk

18.3.3.2 Operational risk: Climate-related financial risks in banking operations

We assess the climate-related financial risks from banking operations as low in terms of both physical risks and transition risks in the short and long term.

In terms of physical risks, greater frequency of extreme weather events could impact bank operations in a very unfavourable scenario. The likelihood of environmental damage to the bank's operations, particularly flooding, is considered to be very low. The bank's buildings are predominantly located in the Canton of Zurich and the operationally critical buildings are in the city of Zurich. Contingency solutions are in place for mission-critical facilities and are regularly tested as part of business continuity management. Environmental and accident risks are an integral part of operational risk management.

Transition risks from banking operations are estimated to be low. Compared with other sectors, the operational business of a bank causes clearly below-average direct CO_2e emissions. As a bank that is primarily active locally, travel activities also play a subordinate role at Zürcher Kantonalbank. As part of its corporate environmental pro-

gramme, Zürcher Kantonalbank is continuously reducing its CO_2e emissions from banking operations. The achievement of objectives is reviewed annually. The remaining CO_2 emissions have been 100 percent offset since 2009. This means that the operations of Zürcher Kantonalbank have been climate-neutral since 2009.

18.3.3.3 Credit risks: Climate-related financial risks in the lending business

We assess the physical climate-related financial risks from the lending business as low in the short term and somewhat higher in the longer term, depending on the achievement of climate targets. We assess the transition risks from the lending business as moderate, but clearly identifiable.

Physical risks may arise, for example, from negative effects of climate change on the value of collateral for covered loans. The focus here is on the mortgage business. The properties could be damaged by extreme weather events and thus lose value (see also section 18.5). The mortgage business is of high importance for Zürcher Kantonalbank. It is strongly focused on the Greater Zurich Area, but has a highly diversified mortgage portfolio within that area. All properties financed are located in Switzerland. Here, too, the most serious natural hazards are floods, which, however, are generally limited to small affected areas because of the nature of the landscape. In addition, a mortgage loan is only at risk of default in the event of natural hazard damage if the damage is not adequately covered by building insurance and the uncovered damage exceeds the unsecured portion of the property value. In the short term, the risk of material credit losses due to climate risks is therefore very low. It can be assumed that extreme weather events will become more frequent as a result of ongoing climate warming. At the same time, however, it can also be assumed that preventive protection measures against natural hazard damage will also improve. In the long term, physical risks in the mortgage business will therefore remain at a low level.

In the rest of the lending business, physical risks are relevant to uncovered commercial finance in that the companies which borrow may themselves be affected by physical climate risks. The portfolio is focused on Switzerland and well diversified. The companies financed may have production facilities in regions that are more exposed to physical risks. The increase in extreme weather events could lead to greater fluctuations in the price of production resources or have a temporary negative impact on supply chains. In addition, climatic conditions will become more important in the choice of location for production facilities. The significance of physical risks varies greatly depending on the sector and industry. Given the broad diversification of the loan portfolio across sectors and the adaptability of the companies financed, physical risks are present in both the short and long term, but are low overall.

Transition risks from the adjustment process towards a low-carbon economy play a bigger role than physical risks for the Zürcher Kantonalbank financing business. The bank's lending, the creditworthiness of borrowers and the value of collateral can all be affected by transition risks: First, changes in legislation (e. g. updated regulations for heating and cooling systems, higher levies) are possible. Second, technological innovations in climate technology that limit the value of existing products or production processes. Third, a change in client preferences towards green products and services; and fourth, changing demands by the various stakeholders on how Zürcher Kantonalbank handles the climate issue (reputational risks).

In the area of mortgage loans, legislative adjustments may have a negative impact on property values. Due to the political processes in Switzerland and the fact that everyone is directly or indirectly affected by the adjustments, shock-like legislative adjustments with shorter transition periods and strong negative effects on the value of residential properties are unlikely. Heating and cooling systems of properties are among the significant CO_2 emitters, and so it is obvious that the legal regulations on these will change. In addition to risks, however, the bank also faces opportunities here in that it can provide advice on the switch to more climate-friendly systems and finance the corresponding investments. In the area of investment properties, it is likely that investor preference will shift towards "green" properties in the medium to long term and that pressure on the prices of properties with poor CO_2 performance will increase in the medium to long term.

In corporate lending, the impact of climate-related transition risks on borrowers' credit ratings will increase. Not only do risks from changes in the legal framework (e. g. levies, bans) have to be taken into account, but also risks

from technological breakthroughs. Innovations in climate technology offer great opportunities, but at the same time they can also jeopardise existing business models. In the long term, some companies and industries will have to adapt their products and services. Reputational risks are another aspect of transition risks in corporate lending. Different stakeholders have different expectations on including climate issues in the bank's lending policy, in some cases even contradictory ones. Stakeholder expectations on climate-compliant lending have changed and will continue to do so in future. The reputational risk for the bank from inadequately updating the sustainability or lending policy therefore increases over time. The fact that contractual commitments in the lending business can run for several years entails the risk of long-term contracts no longer meeting current requirements. Particular attention must be paid to transition risks when lending in carbon-intensive sectors where it is difficult or impossible to adapt to the transition. This is why the Zürcher Kantonalbank lending policy excludes, for example, direct financing of coal mining, oil and gas extraction, fossil fuel power plants and commodity trade financing of coal for electricity production or of crude and fuel oil.

18.3.3.4 Market risks: Climate-related financial risks in the trading business and in financial assets

We assess the climate-related financial risks from trading as low in terms of both physical risks and transition risks in the short and long term.

For the physical risks, there is only a very low probability of financially significant losses from extreme weather events on trading positions. The continuous management of the trading portfolio leads to a low risk of stranded assets in both the short and long term.

On the transition risks side, it cannot be ruled out that legislation, client preferences or public pressure could restrict the universe of tradable financial instruments in the medium to long term. The majority of trading transactions have short maturities, and hedging options are generally available. This enables a particularly rapid adjustment of the exposure and thus of the risk profile. The trading business of Zürcher Kantonalbank focuses on client trading, and the trading book is highly diversified at issuer level, which also has a risk-reducing effect. Zürcher Kantonalbank does not trade in emission certificates. Due to the dynamic nature of the trading business, assessment uncertainty for risks on a long-term perspective is high.

For the financial assets in the liquidity portfolio, a portfolio of very high quality bonds, the intention is to hold the investments until maturity. When it comes to climate-related financial risks, it is the selection of issuers that is of primary importance. There are diversification requirements for the portfolio. Securities of issuers from sectors particularly exposed to CO_2 are excluded from the investment universe, which reduces the risk of transition risks. Stricter legal or regulatory criteria could further restrict the investment universe in the medium and long term. The probability of defaults due to physical risks is classified as low.

18.3.3.5 Climate-related financial risks in the investment and wealth management business

The investment and wealth management business is part of the core business of Zürcher Kantonalbank and is of great importance for income from the commission business and services. This affects investment advisory and wealth management services, as well as the bank as a producer of investment products (e. g. Swisscanto investment funds). The bank incurs what are known as fiduciary risks as a result of its fiduciary responsibility in the investment and wealth management business. Fiduciary risk may arise if Zürcher Kantonalbank does not act appropriately or in the best interests of the client when providing advice or managing client assets. Fiduciary risks are composed of business and strategic risks, operational risks and compliance risks, all of which are influenced by climate risks, among other factors. Investors are compensated for the risks they retain by the return on their investments. Fiduciary risks combine the client and bank perspectives.

We assess the climate-related financial risks from the investment and wealth management business as low in terms of physical risks and medium to low in terms of transition risks.

Physical climate risks: Defaults or sharp declines in the value of individual issuers' securities as a result of extreme weather events cannot be ruled out. However, diversification in the investment portfolios and the ongoing adjustment of asset allocation reduce the risk of major losses from individual events. Risk disclosure and risk management are integrated into the investment advisory process in the Investment Solutions unit, ensuring that investment decisions delegated to the bank are made within the guidelines set by clients in advance. This reduces the fiduciary risk (and thus the reputational risk) for the bank. Overall, the physical risks are therefore very low in the short term and low in the long term.

Transition risks: Investment solutions bearing the "Sustainable (ESG)" designation, which take into account environmental and climate aspects in addition to social and governance ones, mean investors can invest according to their sustainability and climate preferences. Systematic checks on preferences and transparency in reporting reduce transition risks for the bank arising from sudden changes in client needs. Satisfying client needs for sustainable investments thus reduces climate-related financial risks.

Swisscanto is one of the leading providers of sustainable investment products in Switzerland. It rounds out the range of investment solutions with the fund portfolio and the "Responsible" and "Sustainable" designations.

Offering sustainable investments involves the risk that the investment solutions and products labelled as sustainable do not fully meet the expectations of clients and investors. In extreme cases, accusations of "greenwashing" could be made, which, justified or not, might have a negative impact on reputation. National and international regulations on sustainability and the climate in the investment and wealth management business are developing rapidly, and rules in the area are constantly being further clarified. As regulation becomes more intense, the complexity of the business and the compliance risk from the range of products and services will tend to increase. Overall, the transition risks are therefore low in the short term and low to medium in the long term.

18.3.4 Implications for Zürcher Kantonalbank strategy

Climate change and the contribution that Zürcher Kantonalbank can make to achieving internationally agreed climate goals are influencing strategy development. The risk of financial losses due to climate-related changes is one of many sub-issues. Business policy decisions, such as the range of sustainable products and services, investment decisions and the choice of business areas are at the heart of the contribution to achieving climate targets.

The group's strategic principles state that Zürcher Kantonalbank is guided by its statutory public service mandate, which includes the dimensions of service, support and sustainability. In fulfilling its public service mandate, Zürcher Kantonalbank, as a universal bank, observes the principles of sustainability and the recognised rules of risk management.

For Zürcher Kantonalbank, sustainability means making successful economic activity permanently compatible with responsibility for the environment and society. Zürcher Kantonalbank sets itself the following ambition and is guided by the 17 Sustainable Development Goals (SDGs) of the United Nations: Sustainable Development Goals, SDG):

- We actively shape sustainability issues
- We are a leader in sustainable offerings
- We support our clients on the way to a more sustainable future

The opportunities and risks from climate change are part of the annual assessment of strategic risks. The business policy positioning on the topic of "climate" is a central component of the sustainability policy (see section 18.2.1 on page 89).

18.4 Risk management structures and processes

As part of sustainability risks, the management of climate risks is fundamentally an integral part of the risk management processes of Zürcher Kantonalbank. Sustainability issues are taken into account when identifying and assessing risks, and - if risks are material - also in steering, managing, monitoring and reporting about each risk category.

Risk management process

Zürcher Kantonalbank divides the risk management process into the following stages:

18.4.1 Operational risks: Banking operations

Identification & Assessment	When identifying and assessing climate-related financial risks from banking operations, the focus is firstly on the OpRisk assessment of environmental and accident risks and secondly on the greenhouse gas emissions of Zürcher Kantonalbank - Scope 1 and Scope 2 emissions. Using measurement data and proprietary analyses of the CO_2e footprint, the bank's internal experts identify the processes that account for the majority of emissions and that have the greatest reduction potential. A specialised survey tool is used for this purpose. As a member of the "Energy Model Zurich" network, representatives of Zürcher Kantonalbank also regularly exchange views with experts from other large companies in the region on issues and opportunities for increasing energy efficiency.
Steering & Management	Risk management for the direct physical risks of banking operations (e. g. floods) is carried out in Business Continuity Management (BCM). The focus of BCM is on preventing and managing serious crises that threaten the bank's existence. Scenarios include, but are not limited to, the failure of key buildings owned as a result of extreme weather events and the failure of critical suppliers and partners. Whatever the event that could lead to a failure, business continuity plans are in place for critical business processes. The emergency response organisation set up specifically for this purpose is responsible for managing the situation in the event of an operational crisis. Zürcher Kantonalbank runs a corporate environment programme at its headquarters as a risk-managing element of the ecological aspect of banking operations. The programme includes environmental targets for operational ecology. The targets set in the corporate environmental programme relate to CO_2e emissions, CO_2e offsetting and energy consumption, amongst other things. Unavoidable CO_2 emissions have been 100 percent offset since 2009. This means that the operations of Zürcher Kantonalbank have been climate-neutral since 2009. The targets are set on a medium-term horizon and approved by the CEO. The focus is on continuously reducing CO_2e emissions and increasing operational ecological performance. As a central component of the Zürcher Kantonalbank's environmental management system, this promotes sustainability in banking operations.
Monitoring & Reporting	The business recovery options implemented, business continuity plans, emergency response and management of operational crises are regularly reviewed by means of business continuity tests. These include holding emergency drills to test response capabilities to specific crisis events. The achievement of objectives in the corporate environmental programme is reviewed annually. The environmental management system of Zürcher Kantonalbank has been certified in accordance with ISO 14001 since 2002 and is audited annually. The internal Public Service Mandate unit prepares an annual report, which is published on the bank's website. One component of this annual report is information on the reduction achieved in CO_2e emissions from banking operations. For internal purposes, the Sustainability unit of IT, Operations and Real Estate prepares a separate annual report on its activities, objectives and achievement of targets.

18.4.2 Credit risks: Financing business

Identification & Assessment	At the individual item level, risk identification and assessment in the lending business examine the creditworthiness of the applicant and, depending on the type of loan, assess the collateral (e. g. mortgage, readily marketable collateral) as well. The loan application process verifies that the financing complies with the lending rules, including sustainability requirements. For example, for credit assessments in commercial lending, the rules require that potential impact from changing factors of influence, including ESG requirements, be taken into consideration. At portfolio level, analyses of climate-related financial risks are carried out as required for risk identification and assessment. Examples include the analyses of the mortgage portfolio or the corporate loan portfolio, as shown in section 18.5 of this disclosure.
Steering & Management	Risk management in relation to the financing business takes the form of regulations in the sustainability and credit policies issued by the Executive Board. In the internal lending risk rules, these regulations spell out excluded, undesirable and special risk transactions in detail. These regulations also explicitly apply to financing with a climate and energy focus. The consideration of ESG aspects is addressed in the lending process. This gives preference to sustainable and future-oriented business models. Zürcher Kantonalbank also promotes offers in the financing business that support the reduction of greenhouse gas emissions. Examples of this from the mortgage business include advice on replacing heating systems for properties and concessions for environmentally friendly construction.
Monitoring & Reporting	The management of climate-related financial risks for the loan portfolio focuses firstly on excluding certain sectors and secondly on supplementary offers for clients in the bank's financing business. The controls for monitoring compliance with the lending rules also include the requirements of the credit policy. The internal monitoring reports on the loan portfolio contain information on exposures in climate-sensitive sectors (see also section 18.5 and Annual Report 2021, Risk Report chapter), but as yet no elements such as specific CO_2e emissions of the companies in the loan portfolio. It is expected that the availability of public, quality-assured data on greenhouse gas emissions - especially for non-listed companies - will continue to improve over the coming years, enabling the production of meaningful reports that can in turn also support risk management.

18.4.3 Market risks: Trading and Treasury

Identification & Assessment	For financial investments that come under the responsibility of the Treasury department, which consist of a bond portfolio of very high quality, the CO_2e-intensity is determined regularly using publicly available information and compared with a benchmark from the regulatory investment universe available. When Treasury purchases financial assets, it also checks that the issuer does not belong to an industry ruled out by the sustainability policy for the provision of financing.
Steering & Management	Guidelines for the financial assets that come under the responsibility of the Treasury were drawn up in 2021 to limit climate-related financial risks: first, issuers from sectors that the bank's sustainability policy rules out in its financing business are excluded; second, the average revenue-weighted CO_2e emissions of the portfolio must be at least 35 percent lower than in the reference portfolio of the investment universe limited by the internal investment rules.

Monitoring & Reporting	Compliance with the requirements for limiting the CO_2 intensity of the financial investment portfolio is monitored and reported by Treasury Controlling.

18.4.4 Business risks: Wealth & Asset Management business

Identification & Assessment	Risk identification and assessment in investment advice and wealth management focus on the financial risks of the investment products and of the investment portfolios of clients who buy investment advisory services or who have entrusted the bank with the management of their wealth. In wealth management and investment advisory mandates, the integration of ESG criteria into the investment process makes it possible to take a view of the opportunities and risks of investment decisions that is broadened to include sustainability aspects. Zürcher Kantonalbank relies on data from independent providers to assess sustainability. As part of the risk analysis, CO_2e-intensities (Scopes 1 and 2), metrics to identify assets particularly affected by climate risks (also known as "stranded assets") and ESG ratings from the financial services provider MSCI are used. Asset management: Under the "Swisscanto Invest" brand, Zürcher Kantonalbank uses graded combinations of sustainability approaches in its fund and pension offering, depending on the product line. For all portfolios managed under the "Swisscanto Invest" brand, those companies that do not comply with international conventions and/or Swiss law are excluded from direct investments based on a blacklist. Swisscanto Invest has developed the Swisscanto Sustainability Rating to assess sustainability; this goes beyond just the climate aspect. The rating is based on four basic pillars, called scores: the ESG score, the controversy score, the climate score and the thematic/SDG score. During the product approval process of investment solutions, care is taken to ensure that the contractually fixed sustainability aspects of the products satisfy the legal requirements and that compliance can be monitored subsequently in investment controlling. Product approval and investment controlling are important elements in reducing greenwashing risks.
Steering & Management	Wealth management mandates are implemented using the ESG integration approach. They must meet a minimum rating of "A" at portfolio level, using ESG ratings from MSCI. If the client selects "Sustainable (ESG)", a higher target rating of 'AA' is aimed for. In addition, more extensive ESG criteria apply to the investment instruments used in the portfolios; these are assessed individually by the ESG Board and approved for use in the mandates. In the case of investment advisory mandates, the reference portfolios used must meet the same conditions as wealth management mandates, but there may be deviations due to explicit client requests. Asset management: The Paris climate target is taken into account as standard in all of Swisscanto's traditional active investment funds. Through active dialogue, companies are encouraged to formulate and implement effective greenhouse gas (CO_2e) reduction targets. By means of capital allocation, investments in CO_2e-intensive companies and countries that do not have a strategy to cut their CO_2e emissions are reduced in favour of companies and countries that are CO_2e-efficient and those that have CO_2e-reduction targets.

Monitoring & Reporting

Investment advice and wealth management: compliance with all requirements, such as the ESG minimum rating and other portfolio indicators on investments in climate-sensitive and other controversial sectors, is monitored daily as part of the risk management process. The audit results form an integral part of internal risk management reporting and the internal risk dialogue between the risk manager and risk management. When speaking to clients, Zürcher Kantonalbank transparently reports the ESG ratings of client portfolios. Asset management: In the case of transactions in the fund assets of Swisscanto Invest funds, compliance with exclusion criteria (blacklist, "Sustainable" and "Responsible" criteria) is checked before any transaction is executed, and compliance is monitored on a daily basis by the Investment Controlling department of the fund management company independently of the respective fund manager. The degree to which the CO_2e reduction target is achieved is monitored by the Risk Management unit and the fund management company's Investment Controlling team. The degree of achievement of the CO_2e target and the Swisscanto Sustainability Rating are also part of the publicly available sustainability reports for investors. Additionally, the Risk Management unit also uses sustainability stress tests when measuring, monitoring and reporting risks.

18.5 Quantitative Information

18.5.1 Operational risk in banking operations: Corporate environmental programme

The corporate environmental programme is Zürcher Kantonalbank's way of continuously reducing CO_2e emissions and increasing operational ecological performance. On a medium-term horizon, environmental targets for operational ecology are set and approved by the CEO. The targets set in the corporate environmental programme relate to CO_2e emissions, CO_2e offsetting and energy consumption, amongst other things.

Under this programme, the bank was able to reduce its CO_2 footprint by around 60 percent between 2010 and 2021, to 2,853 tonnes of CO_2e. Unavoidable CO_2 emissions are 100 percent offset, increasingly by means of negative emissions technologies. This means that the operations of Zürcher Kantonalbank have been climate-neutral since 2009. The following table shows the emissions trend from 2010 to 2021.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CO_2e (t)	7,074	6,935	6,559	6,244	5,369	5,140	4,401	3,987	3,973	3,507	2,712	2,853

The environmental management system has been certified in accordance with ISO 14001 since 2002 and is audited annually. Further information on the goals and achievements under the environmental management system are published on the Zürcher Kantonalbank website at Operational environmental targets: We aim to continuously lower the CO2 emissions (zkb.ch).

18.5.2 Credit risks: Physical risks in the residential mortgage portfolio

Analysis of physical risks as part of climate-related financial risks in different business areas has shown that the greatest potential loss could occur in the residential sub-portfolio as a result of a flood. Zürcher Kantonalbank carried out corresponding simulation calculations in 2021. The potential extent of damage was analysed for medium (50th percentile), large (75th percentile), and very large (95th percentile) events. The buildings in the residential sub-portfolio (single-family homes, apartments, multi-family homes) were divided into three hazard level zones based on official flood hazard maps, and also into three classes based on the replacement value. For each of these categories, maximum loss estimates were provided by a Swiss insurer. The estimated damage to buildings in the residential sub-portfolio in the Canton of Zurich (about 85 percent of the financing volume) is about CHF 50 million for a medium event, CHF 160 million for a large event and CHF 870 million for a very large event. Compared to the estimated replacement value of around CHF 97 billion, this is equal to a loss ratio of between 0.2 percent and a maximum of 1.2 percent. It may be assumed that this damage is covered by the building insurance of the Canton of Zurich, subject to benefit caps and deductibles. The default risk for the bank can be classified as low because the bank's mortgage loans are only at risk of default if the loss exceeds both the building insurance coverage and the unsecured portion of the property value.

18.5.3 Credit risks: Transition risks in the commercial financing business

Zürcher Kantonalbank follows the internationally established UNEP-FI and TCFD recommendations on the disclosure of transition risks from credit exposure to climate-sensitive industries and, as a subset thereof, carbon-related industries. TCFD defines "carbon-related" as industries associated with the energy and utilities sectors as defined in the Global Industry Classification Standard, excluding water supply and renewable power generation. Zürcher Kantonalbank defines "climate-sensitive" as more broadly referring to those industries that are associated with higher transition risks due to their greenhouse gas emissions. Zürcher Kantonalbank bases its delimitation on emission statistics and uses the Swiss or European industry classification. The Commodity Trade Finance (CTF) sub-portfolio is reported separately, irrespective of the industry, and is subject to restrictions from the bank's sustainability policy as mentioned below. The following chart shows the uncovered loans and advances in the Corporates portfolio using this classification.

Unsecured loans and advances in the companies client portfolio by "climate-sensitive" and other industries

31.12.2021 in CHF million Industry designation	Exposure	in % of unsecured exposure	in % of balance sheet exposure
Mining / crushed rock and earths	7	0.1%	0.0%
Metal production / processing	26	0.5%	0.1%
Sewage and waste disposal and elimination of environmental pollution	51	1.0%	0.2%
Agriculture, hunting and related activities	85	1.7%	0.3%
Glass / ceramics / cement	136	2.6%	0.4%
Chemical products	195	3.8%	0.6%
Transport (incl. mountain railways, but excluding railroads)	206	4.0%	0.7%
Automotive	491	9.5%	1.6%
Energy supply	673	13.1%	2.2%
CTF (commodity trade finance)	710	13.8%	2.3%
Total climate-sensitive sectors	**2,580**	**50.0%**	**8.3%**
Total other sectors	**2,576**	**50.0%**	**8.3%**
Total companies client portfolio loans and advances unsecured	5,156	100.0%	16.5%
Real estate financing	24,444	–	78.4%
Other products	1,579	–	5.1%
Total balance sheet exposure companies	**31,179**	**–**	**100.0%**

In terms of total balance sheet exposure in this portfolio, climate-sensitive sectors account for around 8.3 percent. This includes the entire energy sector, although it almost exclusively comprises financing for sustainable energy sources. In accordance with the exclusion criteria in the sustainability policy, Zürcher Kantonalbank does not provide financing in industries designated by TCFD as carbon-related.

In the financing business, Zürcher Kantonalbank is guided in particular by the objectives of the federal government and the Canton of Zurich with regard to the 2030 Agenda and the achievement of greenhouse gas neutrality in 2050. It therefore does not provide financing for coal mining, oil and natural gas production or fossil-fuel power plants. The following are explicitly excluded in Commodity Trade Finance (CTF): coal for electricity production (thermal coal), crude and heavy oil, bitumen/asphalt, asbestos, uranium, precious woods, live goods, diamonds, rare earth metals, perishable goods and non-certified palm oil. In the case of commodity trading clients, the bank systematically reviews sector-specific ESG risks and opportunities during onboarding as part of due diligence and on an annual basis. This review is based on reported data or data collected through the bank's own questionnaires.

18.5.4 Business risks: Wealth & Asset Management business

Wealth management mandates are implemented using the ESG integration approach. They must meet a minimum rating of "A" at portfolio level, using ESG ratings from MSCI. If the client selects "Sustainable (ESG)", a higher target rating of "AA" is aimed for. In the case of investment advisory mandates, the reference portfolios used must

meet the same conditions as wealth management mandates, but there may be deviations due to explicit client requests.

Asset management: The Paris climate target is taken into account as standard in all of Swisscanto's traditional active investment funds. Through active dialogue, companies are encouraged to formulate and implement effective greenhouse gas (CO_2e) reduction targets. By means of capital allocation, investments in CO_2e-intensive companies and countries that do not have a strategy to cut their CO_2e emissions are reduced in favour of companies and countries that are CO_2e-efficient and those that have CO_2e-reduction targets.

The standard climate target for the traditional, active funds in the "Responsible" product line is to reduce the CO_2e-intensity of the portfolios by 13.35 percent between the end of 2019 and the end of 2021. This figure is consistent with the 2-degree climate target and requires a 4 percent reduction per year plus economic growth. Some funds have different quantitative climate targets (e. g. almost all "Sustainable" funds pursue a 1.5 degree reduction path, which requires an annual CO_2e reduction of 7.5 percent, and the passive funds in the "Responsible" product line aim for a relative CO_2e intensity reduction of 20 percent compared to the benchmark). As at the end of 2021, the CO_2e-intensity of traditional active investment funds and passive investment funds in the "Responsible" product line was 36 percent below the respective target value on average across all funds.