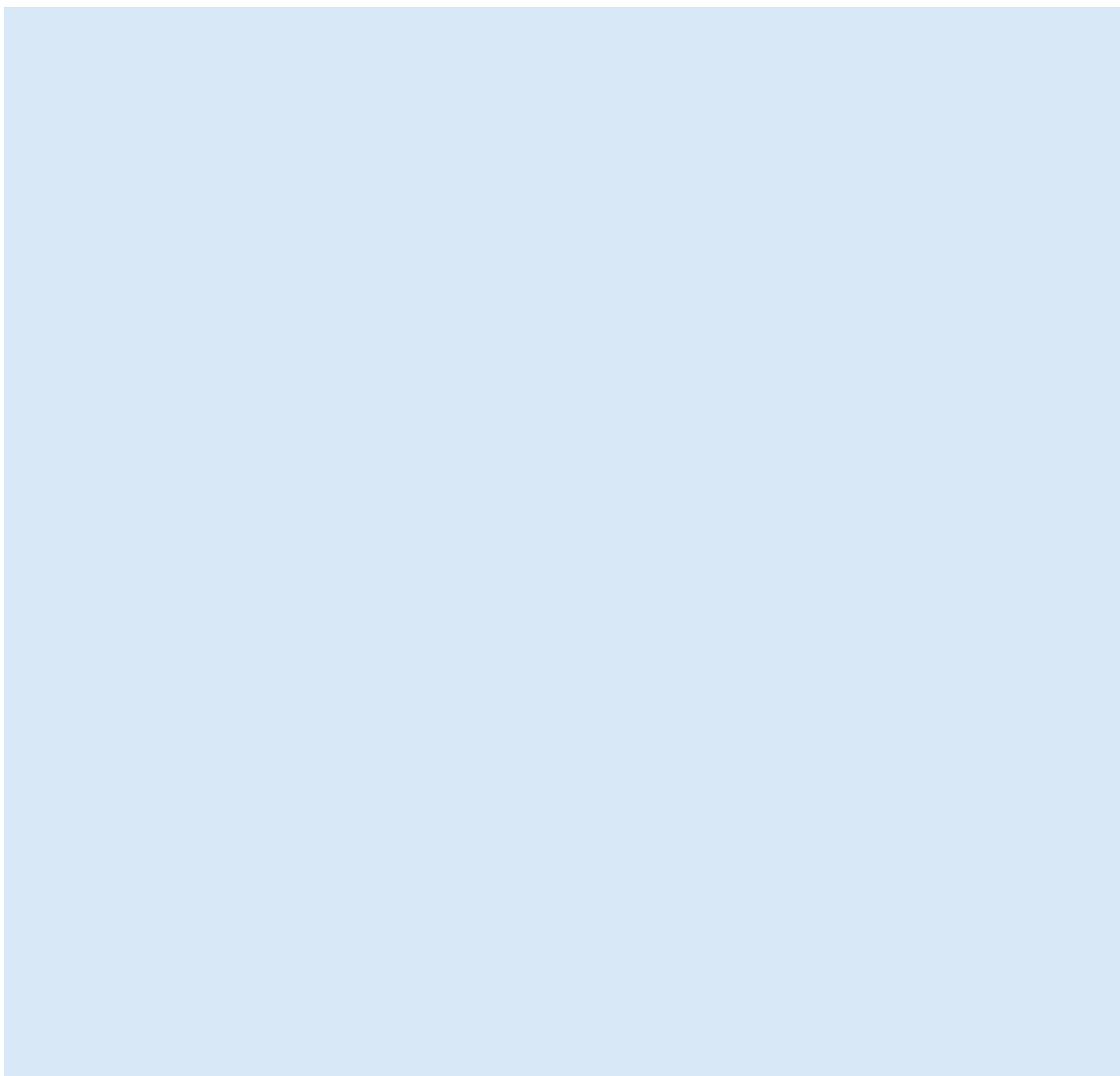


Risk review

Annual results 2018



Message from our Group Chief Risk Officer

Building a resilient future is at the heart of all we do.



Keeping a critical eye on the dynamic changes in the global risk landscape, their impact on our customers, our communities and our business, enables us to build a resilient future.”

Alison Martin
Group Chief Risk Officer

For Zurich, 2018 was another year of continuous improvement in our strong risk management practices.

Managing risk and opportunities

Our enterprise risk management framework supports the achievement of the Group's strategy by upholding an efficient and effective risk-based control environment and helps protect capital, liquidity, earnings and reputation. By effectively managing our risks, we maintain our resilience and make sure we are there when our customers need us. Zurich's risk review describes our major risks and how we manage them.

Among the risks we focused on in 2018 are the uncertainties of geopolitical and macroeconomic environments, inflation, credit and cyber risks, and risks to the execution of our organizational transformation.

As the Group continues to embrace technological and innovative solutions, risk management provides assurance by making use of our Total Risk Profiling™ (TRP) risk assessment process to stay on top of both external and internal risks to our strategy and financial plan.



Digital transformation

The digital transformation of the industry can be seen in all aspects of our business, and we support the Group to manage the risks associated with driving digital transformation throughout the customer journey. We follow a holistic approach by providing risk insights on major digital trends and developments in our risk management organization.

Managing security risks, including cyber risk, remains a key focus for Zurich. We introduced a dedicated framework to measure exposure to this risk. We enhanced our capabilities by increasing the emphasis on risk types resulting from digital transformation, notably focusing on information security, emerging technologies, and innovation.

Finding ways of doing things differently, using digital capabilities and focusing on providing assurance, insight, and oversight for all our stakeholders are key factors driving our digitalization.

Focus on climate risk

Identifying risks and opportunities in our dynamic environment enables us to support sustainable and relevant solutions for our customers.

In 2018 we published a white paper, 'Managing the Impacts of Climate Change: Risk Management Responses.' The paper highlights the interconnected nature of climate change risk and emphasizes its increasing relevance to businesses. Managing this risk is vitally important when considering exposure to both physical and transition risk. Provided in this report are a number of risk management tools and practices at companies' disposal to support customers in managing this systemic risk.

Financial strength supports the Group's dividend strategy

We use sensitivity and scenario analyses to assess the potential impact of conditions under stress.

The Group identifies plausible threat scenarios and quantifies their potential impact on financial resources, or capital required, or both. Depending on the outcome, we develop, implement and monitor appropriate actions.

In this report, we present the Zurich Economic Capital Model (Z-ECM) results as well as sensitivity analysis to adverse scenarios. Zurich's very strong Z-ECM capital position, together with strong cash-remittances, demonstrates the resilience of the Group's dividend strategy to external events.

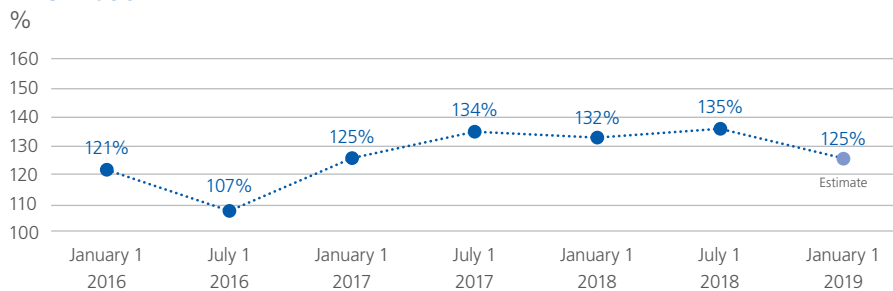


Alison Martin
Group Chief Risk Officer

Economic risk profile

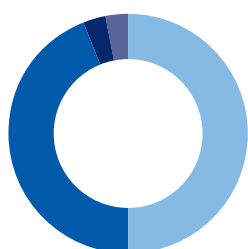
The Group's Z-ECM ratio increased from 132 percent as of January 1, 2018 to 135 percent as of July 1, 2018. The January 1, 2019 estimate is 125 percent with an error margin of +/- 5 percentage points. The development of the Z-ECM ratio in 2018 was driven mainly by adverse financial market performance, economic profit generation, and selective acquisitions.

Z-ECM ratio



Total Z-ECM capital required: USD 30.7 billion

%, as of July 1, 2018



Insurance risk	50%
Market risk, including investment credit risk	44%
Other credit risk	3%
Operational risk	3%

Highlights by risk type

Insurance risk

The Group's insurance risk is diversified by geography, line of business, product and customer, supported by our centralized purchase of reinsurance.

 14

Market risk

In 2018 the Group's overall market risk position remained stable and in line with our risk appetite. Interest rate risk contribution has moderately increased following liability modelling refinements, partially off-set by a lower credit risk position.

 21

Other credit risk

Our credit exposures related to reinsurance assets were of sustained high credit quality and remained basically unchanged in 2018 compared with 2017.

 28

Operational risk

We established a dedicated framework for key focus areas such as information security and cyber risk.

 31

Risk review

Contents

Risk management	5
– Objectives of risk management	5
– Risk management framework	5
– Risk governance and risk management organization	7
Capital management	8
– Objectives of capital management	8
– Capital management framework	8
– Capital management program	8
Risk and solvency assessment	9
– Economic capital adequacy	9
– Insurance financial strength rating	12
– Regulatory capital adequacy	13
Analysis by risk type	14
– Insurance risk	14
– Market risk, including investment credit risk	21
– Other credit risk	28
– Operational risk	30
– Liquidity risk	32
– Strategic risk and risks to the Group's reputation	33
– Climate-change risk	33

The risk review information marked 'audited' is an integral part of the consolidated financial statements.

Audited

This 'audited' symbol indicates that the information contained within the shaded panel is audited and forms an integral part of the consolidated financial statements.

Audited

Risk management

Objectives of risk management

Taking risk is inherent to the insurance business, but such risk-taking needs to be made in an informed and disciplined manner, and within a pre-determined risk appetite and tolerance.

The major risk management objectives at Zurich Insurance Group (Zurich, or the Group) are to:

- ▶ Support achievement of the Group strategy and protect capital, liquidity, earnings and reputation by monitoring that risks are taken within the Group's risk tolerance
- ▶ Enhance value creation by embedding disciplined risk-taking in the company culture and contribute to an optimal risk-return profile where risk reward trade-offs are transparent, understood, and risks are appropriately rewarded
- ▶ Efficiently and effectively diversify risk and mitigate unrewarded risks
- ▶ Encourage openness and transparency to enable effective risk management
- ▶ Support decision-making processes by providing consistent, reliable and timely risk information
- ▶ Protect Zurich's reputation and brand by promoting a sound culture of risk awareness, and disciplined and informed risk taking

Risk management framework

The risk management framework is based on a governance process that sets forth clear responsibilities for taking, managing, monitoring and reporting risks.

The Zurich Risk Policy is the Group's main risk governance document; it sets standards for effective risk management throughout the Group. The policy describes the Group's risk management framework, identifies Zurich's principal risk types and defines the Group's appetite for risks at Group level. Risk-specific policy manuals provide guidelines and procedures to implement the principles in the Zurich Risk Policy. Ongoing assessments verify that requirements are met.

The Group regularly reports on its risk profile at local and Group levels. The Group has procedures to refer risk issues to senior management and the Board of Directors in a timely way. To foster transparency about risk, the Board receives quarterly risk reports and risk updates. In 2018, reporting was supplemented with in-depth risk insights into topics such as macroeconomic developments, information security management, climate change-related risks, and credit risk and country risk.

The Group assesses risks systematically and from a strategic perspective through its proprietary Total Risk Profiling™ (TRP) process, which allows Zurich to identify and evaluate the frequency and severity of a risk scenario. The Group then develops, implements and monitors improvements. The TRP process is integral to how Zurich deals with change, and is particularly suited to evaluate strategic risks, as well as risks to Zurich's reputation. At Group level, this process is ongoing, with regular reviews with senior management.

Risk review (continued)

Audited

The Group's risk appetite statement includes capital, liquidity, earnings volatility and non-financial metrics. The Group regularly measures and quantifies material risks to which it is exposed. Zurich's policy is to maintain capital consistent with an 'AA' financial strength rating for the Group. The Group translates that goal into a quantified risk tolerance. The primary metric used to steer business is the Zurich Economic Capital Model (Z-ECM) which provides a key input into the Group's strategic planning process as an assessment of the Group's risk profile against the Group's risk tolerance. The Z-ECM forms the basis for optimizing the Group's risk-return profile by providing consistent risk measurement across the Group.

Group's Z-ECM overall risk appetite and tolerance

<90%	90–100%	100–120%	120–140%	>140%
Z-ECM ratio below Group risk tolerance level, requiring appropriate remedial actions	Position may be tolerated for a certain length of time depending on the risk environment	'AA' target range No action required as within stated objective and equivalent to 'AA' rating	Consider increased risk-taking or remedial actions	Z-ECM ratio indicating over-capitalization, requiring implementation of mitigating actions
Z-ECM ratio				

Risk-based remuneration

Based on the Group's remuneration rules, the Board of Directors designs and structures remuneration arrangements that support the achievement of strategic and financial objectives, and ensures such arrangements do not encourage inappropriate risk-taking. With regard to the latter, the Group Chief Risk Officer (Group CRO) consults with the other assurance, control and governance functions to provide the Group CEO with a review of risk factors to consider in the annual variable-compensation process. In consultation with these functions, the Group CRO also provides an individual assessment of Group key risk takers as part of their annual individual performance assessment. For more information on Zurich's remuneration system, see the 'remuneration report.'

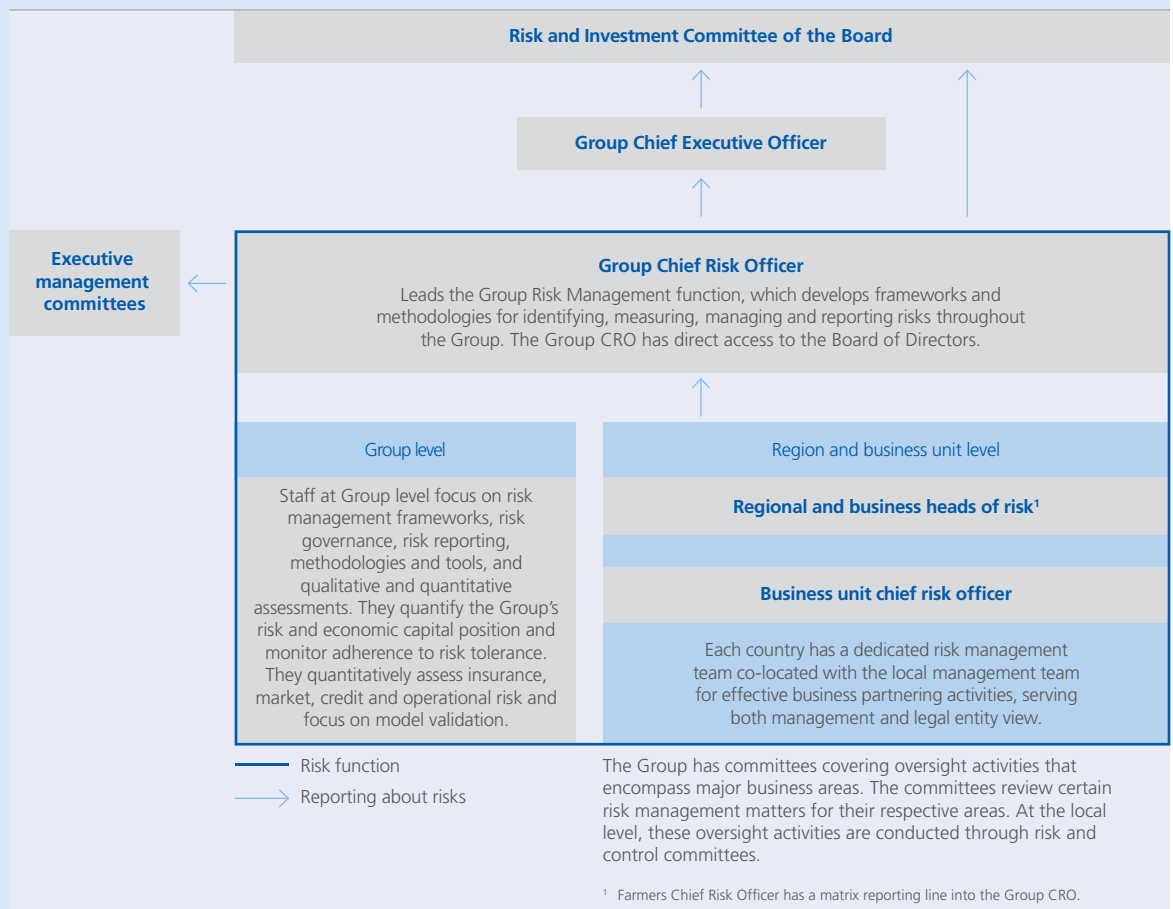
Audited

Risk governance and risk management organization

For information on the Group's overall governance, including the Board of Directors and Group executive level, see the 'corporate governance report (unaudited).'

Risk management organization

The Group Risk Management function is a global function, led by the Group CRO.



The risk function is independent of the business by being a vertically integrated function where global risk employees directly report into the Group CRO, unless otherwise required by local laws or regulations. Risk officers are embedded in the business, positioning them to support and advise, and independently challenge, business decisions from a risk perspective. As business advisers on risk matters, the risk officers, equipped with technical risk skills as well as business skills, help foster a risk-aware culture in the business.

Audited

Capital management

Objectives of capital management

The Group manages its capital to maximize long-term shareholder value while maintaining financial strength within its 'AA' target range, and meeting regulatory, solvency and rating agency requirements. In particular, the Group endeavors to manage its shareholders' equity under IFRS to balance maximization of shareholder value and constraints imposed by its economic framework, rating agencies and regulators. As of December 31, 2018, shareholders' equity of USD 30.2 billion, subordinated debt of USD 6.8 billion and senior financial debt not maturing within the next year of USD 2.4 billion (since the second quarter 2018, excluding net new issued senior debt) were part of the capital available in the Group's economic framework. Further adjustments usually include such items as intangible assets, deferred tax assets and liabilities, allowing for discounting of liabilities and the value of in-force business or excluding new net issuances of senior debt. For more information, see 'analysis of the Group's Z-ECM available financial resources' (unaudited).

Zurich strives to simplify the Group's legal entity structure to reduce complexity and increase fungibility of capital.

Capital management framework

The Group's capital management framework forms the basis for actively managing capital within Zurich. The Group uses a number of different capital models, taking into account economic, regulatory, and rating agency constraints. The Group's capital and solvency position is monitored and regularly reported to the Executive Committee (ExCo).

Zurich's policy is to allocate capital to businesses earning the highest risk-adjusted returns, and to pool risks and capital as much as possible to operationalize its risk diversification.

The Group's executive management determines the capital management strategy and sets the principles, standards and policies to execute the strategy. Group Treasury and Capital Management executes the strategy.

Capital management program

The Group's capital management program comprises various actions to optimize shareholders' total return and to meet capital needs, while enabling Zurich to take advantage of growth opportunities. Such actions include paying and receiving dividends, capital repayments, share buy-backs, issuance of shares, issuance of senior and hybrid debt, securitization and purchase of reinsurance.

The Group seeks to maintain a balance between higher returns for shareholders on equity held, and the security a sound capital position provides. Dividends, share buy-backs, and issuances and redemption of debt have a significant influence on capital levels. In 2018, the Group paid a dividend out of retained earnings and the capital contribution reserve, executed a share repurchase program, issued senior debt to finance redemptions and investments in the Group's development, and called hybrid debt that was re-financed during 2018.

The Swiss Code of Obligations stipulates that dividends may only be paid out of freely distributable reserves or retained earnings. Apart from what is specified by the Swiss Code of Obligations, Zurich Insurance Group Ltd faces no legal restrictions on dividends it may pay to its shareholders. As of December 31, 2018, the amount of the statutory general legal reserve is more than 40 times the paid-in share capital. The ability of the Group's subsidiaries to pay dividends may be restricted or indirectly influenced by minimum capital and solvency requirements imposed by insurance and other regulators in the countries in which the subsidiaries operate. Other limitations or considerations include foreign exchange control restrictions in some countries, and rating agencies' methodologies.

For details on issuances and redemptions of debt, see note 18 of the consolidated financial statements.

For details on the share repurchase program, see note 19 of the consolidated financial statements.

Audited

Risk and solvency assessment

Economic capital adequacy

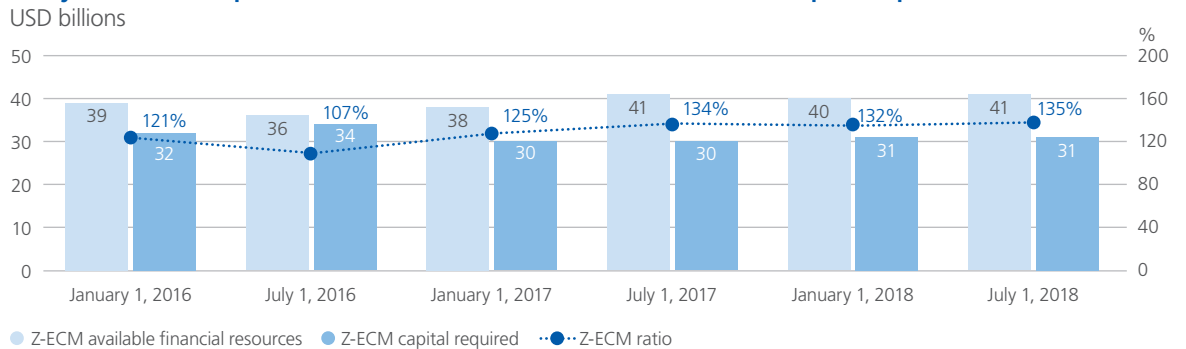
Internally, the Group uses its Zurich Economic Capital Model (Z-ECM), which also forms the basis of the Swiss Solvency Test (SST) model. Z-ECM targets a total capital level that is calibrated to an 'AA' financial strength. Zurich defines the Z-ECM capital required as being the capital required to protect the Group's policyholders in order to meet all of their claims with a confidence level of 99.95 percent over a one-year time horizon.

The Group uses Z-ECM to assess the economic capital consumption of its business on a one-balance-sheet approach. Z-ECM is an integral part of how the Group is managed. It is embedded in the Group's organization and decision-making processes, and is used in capital allocation, business performance management, pricing, and communication. Z-ECM quantifies the capital required for insurance-related risk (including premium and reserve, natural catastrophe, business and life insurance), market risk including investment credit risk, reinsurance credit risk, other credit risk, and operational risk.

At the Group level, Zurich compares Z-ECM capital required to the Z-ECM available financial resources (Z-ECM AFR) to derive an economic solvency ratio (Z-ECM ratio). Z-ECM AFR reflects financial resources available to cover policyholder liabilities in excess of their expected value. It is derived by adjusting the IFRS shareholders' equity to reflect the full economic capital base available to policyholders to absorb any unexpected volatility in the Group's business activities.

The chart below shows the development of the Group's Z-ECM AFR, Z-ECM capital required and Z-ECM ratio over time. As of January 1, 2019, the Z-ECM ratio was estimated at 125% with an error margin of +/-5 percentage points.

Analysis of the Group's Z-ECM available financial resources and Z-ECM capital required

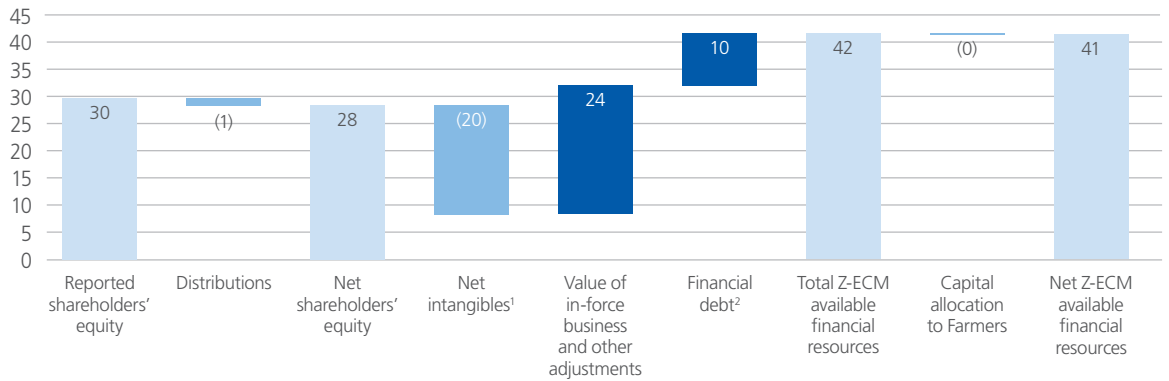


Risk review (continued)

The chart below shows an analysis of the composition of the Group's Z-ECM available financial resources as of July 1, 2018.

Analysis of the Group's Z-ECM available financial resources

USD billions, as of July 1, 2018

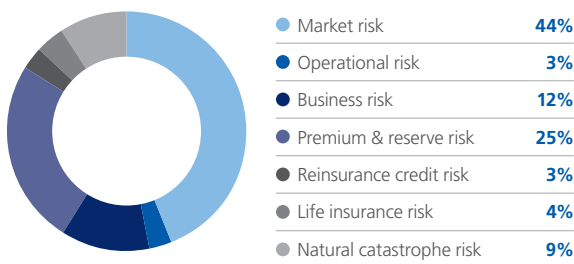


¹ Shareholders' intangible assets including deferred tax assets less deferred front-end fees and deferred tax liabilities
² All debt issues (senior and subordinated) excluding those classified as operational debt or maturing within one year

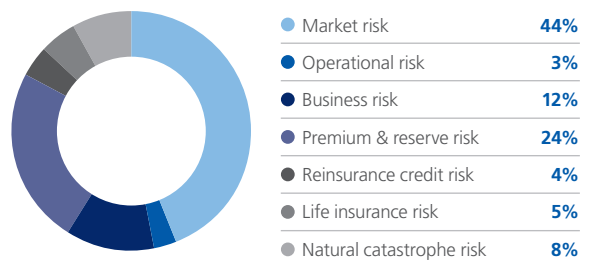
The chart below shows the Z-ECM capital required, split by risk type as of July 1, 2018 and as of January 1, 2018. As of July 1, 2018, the largest proportion of Z-ECM capital required arose from market risk which comprised 44 percent of the total. Z-ECM capital required for premium and reserve risk was the second-largest, comprising 25 percent.

Z-ECM capital required, split by risk type

July 1, 2018
Total Z-ECM capital required: USD 30.7 billion



January 1, 2018
Total Z-ECM capital required: USD 30.6 billion

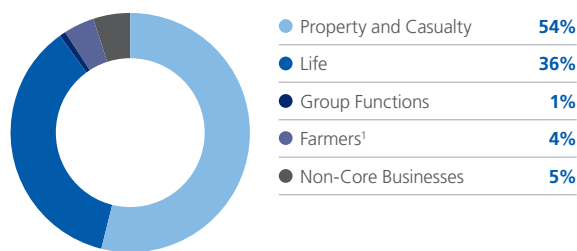


The total allocated capital as of July 1, 2018 equaled USD 30.9 billion. As of July 1, 2018 the largest proportions of Z-ECM capital required were allocated to Property & Casualty with 54 percent and Life with 36 percent of the total. The following chart shows the Z-ECM capital required allocated to the businesses as of July 1, 2018 and January 1, 2018.

Total capital allocated, by business

July 1, 2018

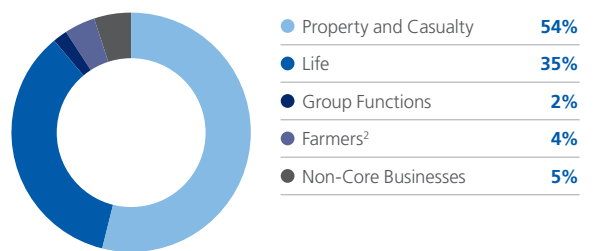
Total capital allocated: USD 30.9 billion¹



¹ Includes direct allocation of USD 0.2 billion to Farmers.

January 1, 2018

Total capital allocated: USD 31.0 billion²



² Includes direct allocation of USD 0.4 billion to Farmers.

Sensitivity and scenario analysis

The Group evaluates sensitivities to, and stress scenarios on, the Z-ECM ratio, and presents results relative to Zurich's risk tolerance and appetite. The sensitivities and stress scenarios in the following chart capture two key risks to the Group: market risk and insurance risk. For insurance risk, the chart shows the three largest natural catastrophe events to which the Group is exposed.

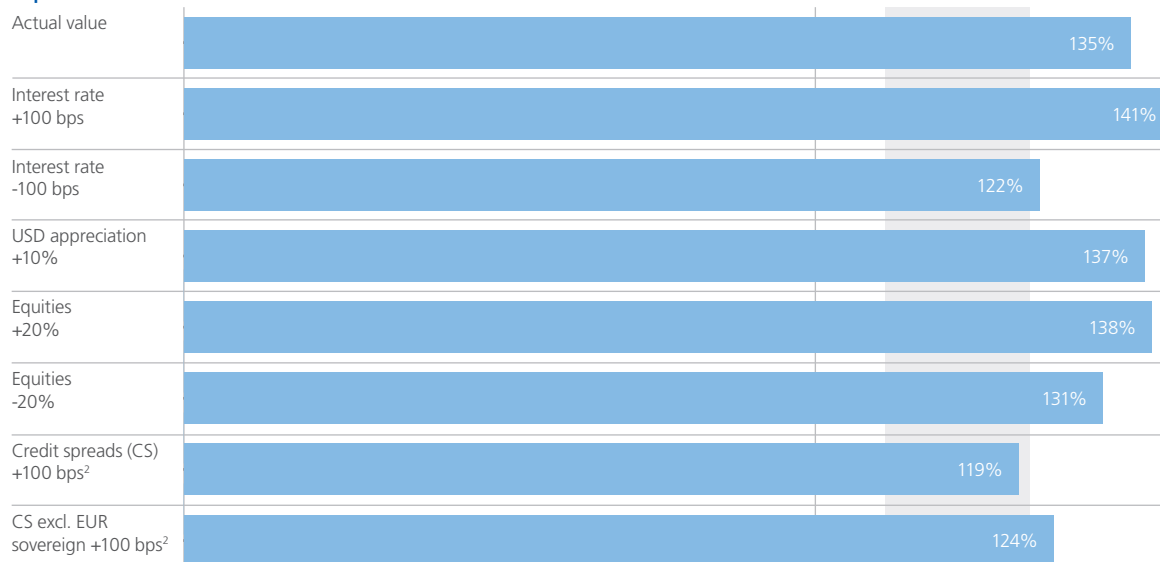
Market risk sensitivities show the estimated impact on the Group's Z-ECM ratio of a one percentage point (100 basis points or bps) increase/decrease in yield curves, a 10 percent appreciation in the U.S. dollar, a 20 percent rise/decline in all stock markets, and a one percentage point change in credit spreads, with and without euro-denominated sovereign bonds. The sensitivities are considered as separate but instantaneous scenarios. They are a best estimate and non-linear, i.e., a change in the scenario input could result in disproportionately higher (or lower) impact on the Z-ECM ratio depending on the prevailing market conditions at the time.

Scenarios are defined as events that have a very small probability of occurring but that could, if realized, negatively affect the Group's Z-ECM AFR. The impact of insurance-specific scenarios on the required capital is not taken into account.

Risk review (continued)

Z-ECM sensitivities and scenarios¹

as of July 1, 2018

Impact on the Z-ECM ratio from sensitivities to financial market conditions:**Impact on the Z-ECM ratio due to property and casualty risk-specific scenarios:³**¹ Z-ECM is calibrated at 99.95 value at risk (equivalent to an 'AA' rating).² Credit spreads (CS) include mortgages, and including and excluding euro sovereign spreads. Sensitivity is net of profit sharing with policyholders.³ The insurance risk-specific scenarios relate to natural catastrophe events that are estimated on a modeled 250-year net aggregate loss (equivalent to a 99.6% probability of non-exceedance).**Audited****Insurance financial strength rating**

The Group has interactive relationships with three global rating agencies: Standard & Poor's, Moody's, and AM Best. The insurance financial strength rating (IFSR) of the Group's main operating entity, Zurich Insurance Company Ltd (ZIC), is an important element of Zurich's competitive position. The Group's credit ratings derived from the financial strength ratings also affect the cost of capital.

In October 2018, Standard & Poor's affirmed ZIC's 'AA-' IFSR with a stable outlook and stated that "Zurich's performance (...) proves its management's ability to control the strategic plan's execution and adjust it accordingly." As a result, Standard & Poor's reassessed the management and governance factor in the rating analysis to strong from satisfactory.

Standard & Poor's sees Zurich's enterprise risk management as 'very strong,' based on a positive view of our risk management culture, risk controls, emerging risk management, risk models and strategic risk assessment.

As of December 31, 2018, the IFSR of ZIC, the main operating entity of the Group, was 'AA-/Stable' by Standard and Poor's, 'Aa3/Stable' by Moody's, and 'A+ (Superior)/Stable' by A.M. Best.

Audited

Regulatory capital adequacy

The Group endeavors to manage its capital so that all of its regulated entities meet local regulatory capital requirements at all times.

In each country in which the Group operates, the local regulator specifies the minimum amount and type of capital that each of the regulated entities must hold in addition to their liabilities. In addition to the minimum capital required to comply with the solvency requirements, the Group aims to hold an adequate buffer to ensure regulated subsidiaries meet local capital requirements.

Regulatory requirements in Switzerland

Under the Swiss Solvency Test (SST), insurance companies and insurance groups can apply to use company-specific internal models to calculate risk-bearing and target capital, as well as the SST ratio. The SST ratio has to be calculated as per January 1 and must be submitted to the Swiss Financial Market Supervisory Authority (FINMA). Zurich filed with FINMA an SST ratio of 216 percent (unaudited) as of January 1, 2018.

In 2018, Zurich continued to enhance its internal model, advanced the approval process with FINMA, and has received approval for specific enhancements of the model. The model approval process continues for other parts of the internal model. The 2019 model changes will primarily address new regulatory requirements that enter into force in 2020 and that have not yet been implemented into the Group's internal model. Zurich intends to file these modules for FINMA's approval during the course of 2019. The Group does not expect a material impact on the SST ratio as of January 1, 2019 from the changes made to the model in 2018 (unaudited).

Regulatory requirements in other countries

Regulatory requirements in the European Economic Area (EEA)

The main regulatory framework governing the Group's subsidiaries in the EEA is Solvency II. This is a risk-based capital framework which covers capital requirements (pillar 1), governance and risk management (pillar 2) and reporting (pillar 3). All EEA-based legal entities of the Group use the Solvency II standard formula for their pillar 1 requirements with the exception of Zurich Insurance plc (Ireland) that applies an approved internal model, which is aligned with the Z-ECM.

Regulatory requirements in the U.S.

In the U.S., required capital is determined to be 'company action level risk-based capital' calculated using the National Association of Insurance Commissioners' risk-based capital model. This method, which builds on regulatory accounts, measures the minimum amount of the capital for an insurance company to support its overall business operations by taking into account its size and risk profile.

Regulatory requirements in Asia Pacific, Latin America, and Middle East and Africa

Every country has a capital standard for insurance companies. Several jurisdictions (e.g., Brazil and Mexico) have taken approaches similar to Solvency II.

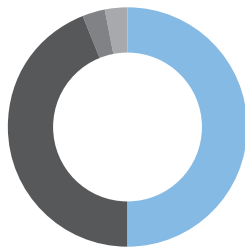
Risk review (continued)

Analysis by risk type

Insurance risk

Section highlights

Total Z-ECM capital required: USD 30.7 billion
%, as of July 1, 2018



● Insurance risk	50%
● Market risk, including investment credit risk	44%
● Other credit risk	3%
● Operational risk	3%

Key risk and capital indicators

Z-ECM, in USD billions

	Q2 2018	Q2 2017
Business risk	3.7	2.8
Life liability risk	1.3	1.6
Premium & reserve risk	7.5	7.1
Natural catastrophe risk	2.7	2.0

Audited

Insurance risk is the inherent uncertainty regarding the occurrence, amount or timing of insurance cashflows. The profitability of insurance business is also susceptible to business risk in the form of unexpected changes in expenses, policyholders' behavior, and fluctuations in new business volumes. Zurich manages insurance risk through:

- ▶ Strong underwriting and claims standards and controls
- ▶ Robust reserving processes
- ▶ External reinsurance

Property and casualty insurance risk

Property and casualty insurance risk arises from coverage provided for motor, property, liability, special lines and worker injury. It comprises premium and reserve risk, catastrophe risk, and business risk. Premium and reserve risk covers uncertainties in the frequency of the occurrence of the insured events as well as in the severity of the resulting claims. Catastrophe risk predominantly relates to uncertainty around natural catastrophes. Business risk for property and casualty predominantly relates to unexpected increases in the expenses relating to claims handling, underwriting, and administration.

Management of Property & Casualty business insurance risk

The Group's underwriting strategy takes advantage of the diversification of Property & Casualty (P&C) risks across lines of business and geographic regions. Zurich's underwriting governance is applicable throughout the Group. Underwriting discipline is a fundamental part of managing insurance risk. The Group sets limits on underwriting capacity and delegates authority to individuals based on their specific expertise, and sets appropriate underwriting and pricing guidelines. Technical reviews confirm whether underwriters perform within authorities and adhere to underwriting philosophies and policies.

Property & Casualty insurance reserves are regularly estimated, reviewed and monitored by qualified and experienced actuaries at local, regional and Group levels. To arrive at their reserve estimates, the actuaries take into consideration, among other things, the latest available facts, trends and patterns of loss payments. Inflation is monitored with insights feeding into actuarial reserving models and Zurich's underwriting processes and pricing.

To ensure a common understanding of business insights and new trends for reserve analysis, financial plans, underwriting and pricing decisions, the Group has established a culture of continuous cross-functional collaboration. For this, underwriting, actuarial (pricing and reserving), claims, finance, sales and distribution, risk engineering and risk management contribute to quarterly meetings on local and Group level.

Zurich has an Emerging Risk Group, with cross-functional expertise from core insurance functions such as underwriting, claims and risk management to identify, assess and recommend actions for emerging risks.

Audited

Actions are underway to rebalance the portfolio, reducing exposure to long tail lines. Governance is in place to ensure appropriate focus on top-line targets and profitability. Reinsurance is deployed to help manage insurance risk. Group Risk Management also provides independent assurance through risk reviews.

The Group is exposed to losses that could arise from natural and man-made catastrophes. The main concentrations of risks arising from such potential catastrophes are regularly reported to executive management. In 2018, risk-based capital (RBC) for catastrophe risk increased as a result of growth in short tailed lines of business. The most important peril regions and natural catastrophes (Nat Cat) continue to be U.S. and Caribbean windstorm, California earthquake and Europe windstorm.

Natural catastrophes

The Group uses third-party models (adjusted to Zurich's view) to manage its underwriting and ensure accumulations stay within intended exposure limits. The same view Zurich has on natural catastrophe risk also underpins profitability assessment and strategic capacity allocation and guides the type and quantity of reinsurance Zurich buys.

To ensure global consistency, Nat Cat exposures are modeled centrally. Potential losses from property policies with material exposure in hazard-prone geographical areas and from worker injury policies with material exposure in U.S. seismic zones are probabilistically modeled. Losses for other lines of business are estimated based on adjustments to these modelled results. Risk modeling mainly addresses climate-induced perils such as windstorm, flood, tornado, and hail, and geologically-induced perils such as earthquake.

Zurich constantly strives to improve its modeling and improve data quality. It supplements internal knowledge with external knowledge (e.g., the Advisory Council for Catastrophes). Zurich is a governor sponsor of the Global Earthquake Model Foundation, is a shareholder of PERILS AG, and is a member of the Oasis Loss Modeling Framework.

Man-made catastrophes

Man-made catastrophes include events such as industrial accidents, terrorism and cyber attacks.

For terrorism, worker injury and property risk exposures are analyzed to identify areas with significant risk concentration. Other lines of business are assessed, although the potential exposure is not as significant. A vendor- provided catastrophe model is used to evaluate potential exposures in every major U.S. city and selected cities in Europe. The Group's analysis for the P&C business has shown that its exposures outside of North America are lower, in a large part due to government-provided pools. Outside the modeled areas, exposure concentrations are identified in Zurich's Risk Exposure Data Store (REDS). Exposure concentrations for location-based man-made scenarios, other than terrorism, are also identified in REDS, for example industrial explosions at global ports.

The Group uses third-party models to manage its underwriting and accumulations for cyber and casualty catastrophe. We are actively monitoring and managing our cyber exposure and continue to refine products to ensure their appropriateness. Improving modeling capabilities and data capture for cyber and casualty catastrophe risks are key focus areas.

Concentration of Property & Casualty business insurance risk

The Group defines concentration risk in the Property & Casualty (P&C) business as the risk of exposure to increased losses associated with inadequately diversified portfolios. Concentration risk for a property and casualty insurer may arise due to a concentration of business written within a geographical area or of underlying risks covered.

Tables 1.a and 1.b show the Group's concentration of risk within the P&C business by region and line of business based on direct written premiums before reinsurance. P&C premiums ceded to reinsurers (including retrocessions) amounted to USD 7.0 billion and USD 6.5 billion for the years ended December 31, 2018 and 2017, respectively. Reinsurance programs are managed on a global basis, and therefore, net premium after reinsurance is monitored on an aggregated basis.

Risk review (continued)

Audited

Table 1.a

Property & Casualty business – Direct written premiums and policy fees by line of business – current period	in USD millions, for the year ended December 31, 2018					
	Motor	Property	Liability	Special lines	Worker injury	Total
Europe, Middle East & Africa	4,546	4,118	1,962	1,986	343	12,955
North America ¹	1,422	4,622	2,638	2,494	2,735	13,912
Other regions	1,595	1,402	356	1,769	150	5,272
Total	7,563	10,142	4,957	6,249	3,228	32,139

¹ In 2018, the crop business line in North America was reclassified, resulting in a USD 1.7 billion shift from special lines to property.

Table 1.b

Property & Casualty business – Direct written premiums and policy fees by line of business – prior period	in USD millions, for the year ended December 31, 2017					
	Motor	Property	Liability	Special lines	Worker injury	Total
Europe, Middle East & Africa	4,459	3,869	1,927	1,895	335	12,486
North America	1,750	2,691	3,175	3,864	2,934	14,414
Other regions	1,472	1,184	341	1,646	138	4,781
Total	7,681	7,745	5,443	7,405	3,408	31,681

Analysis of sensitivities for Property & Casualty business risks

Tables 2.a and 2.b show the sensitivity of net income before tax and the sensitivity of net assets, using the Group effective income tax rate, as a result of adverse development in the net loss ratio by one percentage point. The sensitivities do not indicate a probability of such an event and do not consider any non-linear effects of reinsurance. Based on the assumptions applied in the sensitivity analysis in tables 2.a and 2.b, each additional percentage point increase in the loss ratio would have a linear impact on net income before tax and net assets. The Group also monitors insurance risk by evaluating extreme scenarios, taking into account the non-linear effects of reinsurance contracts.

Table 2.a

Insurance risk sensitivity for the Property & Casualty business – current period	in USD millions, for the year ended December 31, 2018					
	Europe, Middle East & Africa	North America	Asia Pacific	Latin America	Reinsurance	Total
+1% in net loss ratio						
Net income before tax	(121)	(100)	(23)	(21)	1	(264)
Net assets	(91)	(75)	(17)	(16)	–	(199)

Table 2.b

Insurance risk sensitivity for the Property & Casualty business – prior period	in USD millions, for the year ended December 31, 2017					
	Europe, Middle East & Africa	North America	Asia Pacific	Latin America	Reinsurance	Total
+1% in net loss ratio						
Net income before tax	(119)	(105)	(19)	(19)	1	(260)
Net assets	(79)	(70)	(13)	(13)	1	(174)

Audited

Life insurance risk

The risks associated with life insurance include:

Life liability risk

- ▶ Mortality risk – when on average, the death incidence among the policyholders is higher than expected
- ▶ Longevity risk – when on average, annuitants live longer than expected
- ▶ Morbidity risk – when on average, the incidence of sickness or disability among the policyholders is higher or recovery rates from disability are lower than expected

Business risk

- ▶ Policyholder behavior risk – on average, the policyholders discontinue or reduce contributions or withdraw benefits prior to the maturity of contracts at a rate that is different from expected
- ▶ Expense risk – expenses incurred in acquiring and administering policies are higher than expected
- ▶ New business risk – volumes of new business are insufficient to cover fixed acquisition expenses

Market risk

- ▶ Market risk – the risk associated with the Group's balance sheet positions where the value or cash flow depends on financial markets, which is analyzed in the 'market risk, including investment credit risk' section

Credit risk

- ▶ Credit risk – the risk associated with a loss or potential loss from counterparties failing to fulfill their financial obligations, which is analyzed in the 'market risk, including investment credit risk' and 'other credit risk' sections

A more diversified portfolio of risks is less likely than an undiversified portfolio to be affected across the board by a change in any subset of the risks. The offsetting effects between unit-linked and traditional business reduce some of the risk associated with the life business.

Management of Life business insurance risk

The Group has local product development committees and a Group-level committee to analyze potential new life products that could significantly increase or change the nature of its risks. The Group regularly reviews the continued suitability and the potential risks of existing life products.

Unit-linked products are designed to reduce much of the market and credit risk associated with the Group's traditional business. Risks that are inherent in these products are largely passed on to the policyholder, although a portion of the Group's management fees is linked to the value of funds under management, and hence is at risk if fund values decrease. To the extent that there are guarantees built into the product design, unit-linked products carry mortality/morbidity risk and market risk. Contracts may have minimum guaranteed death benefits where the sum at risk depends on the fair value of the underlying investments. For certain contracts, these risks are mitigated by mortality and morbidity charges.

Other life insurance liabilities include traditional life insurance products, such as protection and life annuity products. Protection products carry mortality, longevity and morbidity risk, as well as market and credit risk. Changes in medical treatments and lifestyle changes are among the most significant factors that could result in earlier or more claims than expected. Disability, defined in terms of the ability to perform an occupation, could be affected by adverse economic conditions. To reduce pricing cross-subsidies, where permitted, premiums are adjusted for factors such as age, gender and smoker status. Policy terms and conditions and disclosure requirements in insurance applications are designed to mitigate the risk arising from non-standard and unpredictable risks that could result in severe financial loss. In the life annuity business, medical advances and improved social conditions that lead to increased longevity are the most significant insurance risk. Annuitant (beneficiary) mortality assumptions include allowance for future mortality improvements.

Risk review (continued)

Audited

The Group is also exposed to risks posed by policyholder behavior and fluctuating expenses. Policyholder behavior risk is mitigated by designing products that, as closely as possible, match revenue and expenses associated with the contract. Expense risk is reduced by carefully controlling expenses, and through regular expense analysis and allocation exercises.

The Group is also exposed to investment and surrender risks related to bank-owned life insurance contracts sold in the U.S. These risks have reduced significantly in recent years as several major clients have switched into less risky investment divisions. See heading 'other contracts' in note 7 of the consolidated financial statements for additional information.

Interest rate guarantees (with concentration in traditional, guaranteed business in Germany and Switzerland and variable annuity business in the U.S. containing minimum guaranteed death benefits) expose Zurich to financial losses that may arise as a result of adverse movements in interest rates. These guarantees are managed through a combination of asset-liability management and hedging.

The Group has a dynamic hedging strategy to reduce the investment risk associated with the closed book of variable annuities written by its U.S. subsidiary Zurich American Life Insurance Company. This exposure has fallen substantially as a result of several policy buy-back programs since 2015.

Concentration of Life business insurance risk

The Group defines concentration risk in the life business as the risk of exposure to increased losses associated with inadequately diversified portfolios of assets or obligations. Concentration risk for a life insurer may arise with respect to investments in a geographical area, economic sector, or individual issuers, or due to a concentration of business written within a geographical area, of a policy type, or of underlying risks covered.

Observing best-estimate assumptions on cash flows related to benefits of insurance contracts gives some indication of the size of the exposure to risks and the extent of risk concentration. Table 3 shows the Group's concentration of risk within Life by region and line of business based on reserves for life insurance on a net of reinsurance basis. The life insurance reserves also include policyholder surplus reserves with a loss absorbing capacity¹, predominantly in Germany for an amount of USD 7.4 billion in 2018 (2017: USD 8.2 billion) and in the UK for an amount of USD 0.5 billion in 2018 (2017: USD 0.6 billion). The Group's exposure to life insurance risks varies significantly by geographic region and line of business and may change over time. See note 8 of the consolidated financial statements for additional information on reserves for insurance contracts.

¹ Policyholder surplus reserves with loss absorbing capacity refer to funds allocated to the policyholders that can be used by the shareholders, under certain conditions which may require regulatory approval.

Table 3

in USD millions, as of December 31

	Unit-linked insurance contracts		Other life insurance liabilities		Total reserves	
	2018	2017	2018	2017	2018	2017
	Life					
Europe, Middle East & Africa	41,229	46,802	77,756	81,182	118,985	127,984
of which:						
United Kingdom	15,323	18,699	3,271	3,468	18,594	22,167
Germany	15,976	17,178	36,980	39,638	52,956	56,817
Switzerland	634	731	17,294	18,123	17,928	18,854
Italy	1,568	1,073	4,521	4,155	6,089	5,228
Ireland	2,347	3,133	2,021	2,260	4,368	5,393
Spain	699	856	11,415	11,182	12,114	12,038
Zurich International	4,339	4,784	309	277	4,648	5,061
Rest of Europe, Middle East & Africa	342	349	1,946	2,078	2,288	2,427
North America	9,241	9,298	893	841	10,135	10,139
Asia Pacific	539	584	2,791	2,731	3,330	3,315
Latin America	13,159	13,687	5,385	5,075	18,544	18,762
Group Reinsurance	–	–	2	–	2	–
Eliminations	–	–	(13)	(3)	(13)	(3)
Subtotal	64,168	70,371	86,814	89,826	150,982	160,197
Other businesses	4,598	5,042	9,474	9,404	14,072	14,446
Total	68,766	75,413	96,288	99,230	165,054	174,643

Reserves, net of reinsurance, by region

Audited

Analysis of sensitivities for Life business insurance risk

The Group uses market-consistent embedded value reporting principles, which allow Zurich to increase its understanding of, and report on, the risk profile of its life products, and how these risks would change under different market conditions. Embedded value is a measure that markets use to value life businesses. For more information, see the 'embedded value report 2018' (unaudited but subject to assurance review) at www.zurich.com/investor-relations/results-and-reports.

Reinsurance for Property & Casualty and Life businesses

The Group's objective in purchasing reinsurance is to provide market-leading capacity for customers while protecting the balance sheet, supporting earnings volatility management, and achieving capital efficiency. The Group follows a centralized reinsurance purchasing strategy for both Property & Casualty (P&C) and Life, and bundles programs, where appropriate, to benefit from diversification and economies of scale. In support of the Group's empowerment-based management model and to align risk-bearing capacities between the Group and individual country operations, the internal reinsurance vehicle introduced in 2017 has been successfully implemented and applied to all externally reinsured lines of business. In addition, to actively manage and reduce potential claims-recovery risks on facultative property and casualty facilities.

The Group structures and aligns its external reinsurance protection to its capital position to achieve an optimum risk-return ratio. This includes participation in the underlying risks through self-retentions. The Group manages its central reinsurance purchasing according to these principles. The cession rate for P&C was 21.0 percent and 19.7 percent as of December 31, 2018 and December 31, 2017, respectively. The cession rate for Life was 7.0 percent and 8.0 percent as of December 31, 2018 and December 31, 2017, respectively.

The Group uses traditional and collateralized reinsurance markets to protect itself against extreme single events, multiple event occurrences across regions, or increased frequency of events. Specifically, to protect the Group against man-made and natural catastrophe scenarios, Zurich arranges per event and annual aggregate global covers as illustrated on the graph on the next page.

The Group participates in the underlying risks through its retention and through its co-participation in excess layers. The contracts are on a loss-occurrence basis except the Global Aggregate Catastrophe cover, which operates on an annual aggregate basis. The current catastrophe covers are placed annually with the exception of the USD 750 million Global Catastrophe treaty, which is a three-year treaty expiring in 2019. In addition to these covers, the Group has some local catastrophe covers, a bilateral risk swap, and various line of business-specific risk treaties in place. These covers are reviewed continuously and are subject to change going forward.

Major changes in 2018 amongst others included the external protection of the Group's financial lines portfolio to support and strengthen the commercial financial lines portfolio management and strategic execution. The structure chosen provides protection against extreme large loss experience.

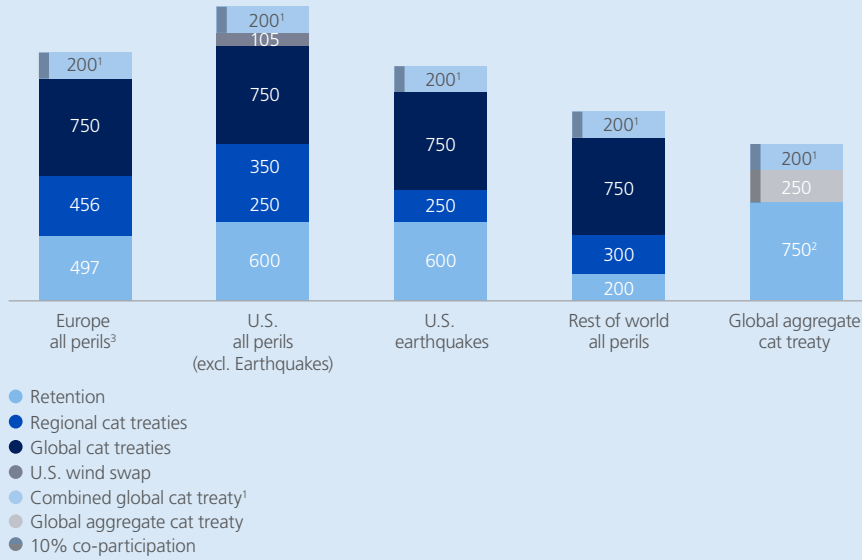
To complement existing treaties, the Group purchases catastrophe reinsurance specific to life insurance for its exposure to natural and man-made catastrophes.

Risk review (continued)

Audited

2018 Group catastrophe reinsurance protection

USD millions, as of December 31, 2018

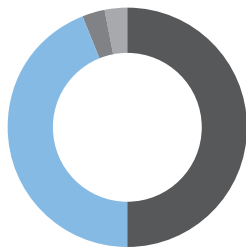


¹ This cover can be used only once, either for aggregated losses or for an individual occurrence or event.
² Franchise deductible of USD 25 million, i.e., losses greater than USD 25 million count towards the erosion of the retention (annual aggregate deductible).
³ Europe cat treaty calculated with EUR/USD exchange rate as of July 31, 2018.

Market risk, including investment credit risk

Section highlights

Total Z-ECM capital required: USD 30.7 billion
%, as of July 1, 2018



● Insurance risk	50%
● Market risk, including investment credit risk	44%
● Other credit risk	3%
● Operational risk	3%

Key risk and capital indicators

Z-ECM, in USD billions

	Q2 2018	Q2 2017
Market risk, including investment credit risk	13.5	15.2

Audited

Market risk is the risk associated with the Group's balance sheet positions where the value or cash flow depends on financial markets. Risk factors include:

- ▶ Equity market prices
- ▶ Real estate market prices
- ▶ Interest-rate risk
- ▶ Credit and swap spread changes
- ▶ Defaults of issuers
- ▶ Currency exchange rates

The Group manages the market risk of assets relative to liabilities on an economic total balance sheet basis. This is done to achieve the maximum risk-adjusted excess return on assets relative to the liability benchmark, while taking into account the Group's risk appetite and tolerance and local regulatory constraints.

The Group has policies and limits to manage market risk and keep its strategic asset allocation in line with its risk capacity. Zurich centrally manages certain asset classes to control aggregation of risk, and provides a consistent approach to constructing portfolios and selecting external asset managers. It diversifies portfolios, investments and asset managers, and regularly measures and manages market risk exposure. The Group has set limits on concentration in investments in single issuers and certain asset classes, as well as by how much asset interest rate sensitivities can deviate from liability interest-rate sensitivities. The Group regularly reviews its capacity to hold illiquid investments.

The Asset/Liability Management Investment Committee reviews and monitors Group strategic asset allocation and tactical boundaries, and monitors Group asset/liability exposure. The Group oversees the activities of local asset/liability management investment committees and regularly assesses market risks at both Group and local business levels. The economic effect of potential extreme market moves is regularly examined and considered when setting the asset allocation.

Risk assessment reviews include the analysis of the management of interest-rate risk for each major maturity bucket and adherence to the aggregate positions with risk limits. The Group applies processes to manage market risks and to analyze market risk hotspots. Actions to mitigate risk are taken if necessary to manage fluctuations affecting asset/liability mismatch and risk-based capital.

Risk review (continued)

Audited

The Group may use derivative financial instruments to mitigate market risks arising from changes in currency exchange rates, interest rates and equity prices, from credit quality of assets, and from commitments to third parties. The Group enters into derivative financial instruments mostly for economic hedging purposes and, in limited circumstances, the instruments may also meet the definition of an effective hedge for accounting purposes.

In compliance with Swiss insurance regulation, the Group's policy prohibits speculative trading in derivatives, meaning a pattern of 'in and out' activity without reference to an underlying position. The Group addresses the risks arising from derivatives through a stringent policy that requires approval of a derivative program before transactions are initiated, and by subsequent regular monitoring by Group Risk Management of open positions and annual reviews of derivative programs.

For more information on the Group's investment result, including impairments and the treatment of selected financial instruments, see note 6 of the consolidated financial statements. For more information on derivative financial instruments and hedge accounting, see note 7 of the consolidated financial statements.

Risk from equity securities and real estate

The Group is exposed to risks from price fluctuations on equity securities and real estate. These could affect the Group's liquidity, reported income, economic surplus and regulatory capital position. Equity risk exposure includes common stocks, including equity unit trusts, private equity, common stock portfolios backing participating-with-profit policyholder contracts, and equities held for employee benefit plans. Exposure to real estate risk includes direct holdings in property and property company shares and funds. Returns on unit-linked contracts, whether classified as insurance or investment contracts, may be exposed to risks from equity and real estate, but these risks are borne by policyholders. However, the Group is indirectly exposed to market movements from unit-linked contracts with respect to both earnings and economic capital. Market movements affect the amount of fee income earned when the fee income level is dependent on the valuation of the asset base. Therefore, the value of in-force business for unit-linked business can be negatively affected by adverse movements in equity and real estate markets.

The Group manages its risks from equity securities and real estate as part of the overall investment risk management process, and applies limits as expressed in policies and guidelines. Specifically, Zurich limits holdings in equities, real estate and alternative investments. To realize an optimal level of risk diversification, the strategy for equities is defined through a composite of market benchmark indices. The Group has the capability and processes in place to change the exposure to the key equity markets within a short time frame through the use of derivatives.

For additional information on equity securities and investment property, see note 6 of the consolidated financial statements.

Risk from interest rates and credit spreads

Interest-rate risk is the risk of loss resulting from changes in interest rates, including changes in the shape of yield curves. The Group is exposed to interest-rate risk from debt securities, reserves for insurance contracts, liabilities for investment contracts, debt issued by the Group, commercial and residential mortgages, employee benefit plans, and loans and receivables.

The Group manages credit-spread risk, which describes the sensitivity of the values of assets and liabilities due to changes in the level or the volatility of credit spreads, over the risk-free interest rate yield curves. Movements of credit spreads are driven by expected probability of default, expected losses in cases of defaults of issuers, the uncertainty of default probabilities and losses.

Returns on unit-linked contracts, whether classified as insurance or investment contracts, are at the risk of the policyholder; however, the Group is exposed to fluctuations in interest rates and credit spreads in so far as they affect the amount of fee income earned if the fee income level is dependent on the valuation of the asset base.

Audited

Analysis of market risk sensitivities for interest rate, equity and credit-spread risks

Group investments sensitivities

The economic market risk sensitivities for the fair value for Group investments before tax as of 2018 is a negative USD 9.9 billion (negative USD 10.7 billion as of 2017) for a 100-basis-point increase in interest rate. For a 100-basis-point decrease in interest rate, the sensitivity is USD 11.1 billion (USD 12.0 billion as of 2017). For a 10 percent decline in equity market, Group investments drop in value by USD 1.1 billion compared to USD 1.2 billion as of 2017. A 100-basis-point increase in credit spreads results in a decrease of USD 5.2 billion compared to USD 5.4 billion as of 2017.

The following describes limitations of the Group investment sensitivities. Group sensitivities show the effects of a change of certain risk factors, while other assumptions remain unchanged. The interest rate scenarios assume a parallel shift of all interest rates in the respective currencies. They do not take into account the possibility that interest rate changes might differ by rating class; these are disclosed separately as credit spread risk sensitivities. The sensitivity analysis is based on economic assets, and not on shareholders' equity or net income as set out in the consolidated financial statements. The sensitivities only cover Group investments, not insurance or other liabilities. The equity market scenarios assume a concurrent movement of all stock markets. The sensitivity analysis does not take into account actions that might be taken to mitigate losses. Actions may involve changing the asset allocation, for example through selling and buying assets. The sensitivities do not indicate a probability of such events occurring in the future. They do not necessarily represent the Group's view of expected future market changes.

In addition to the sensitivities, management uses stress scenarios to assess the impact of more severe market movements on the Group's financial condition. For more information on stress scenarios, see 'Group economic net asset sensitivities' (unaudited), below.

Group economic net asset sensitivities

Basis of presentation – Property & Casualty, Life, and rest of the business

The basis of the presentation for tables 4, 5, and 6 is an economic valuation represented by the fair value for Group investments. IFRS insurance liabilities are discounted at risk-free market rates to reflect the present value of insurance liability cash flows and other liabilities, for example, own debt. The Group describes risk-free market rates as swap rates. In the sensitivities, own debt does not include subordinated debt, which Zurich considers available to protect policyholders in a worst-case scenario.

The basis of presentation for the Life business to financial market movements uses replicating portfolios. The replicating portfolios are portfolios of assets that replicate the cash flows or present values of the life insurance liabilities under stochastic scenarios from the embedded value models. They are calibrated to match dependencies of life insurance liabilities on developments in the financial markets, in respect of interest rates, equity and property. The options and guarantees of the underlying life insurance liabilities are captured through the inclusion of options in the replicating portfolios.

The net impact – the difference between the impact on Group investments and liabilities – represents the economic risk related to changes in market risk factors that the Group faces. Tables 4, 5 and 6 show the estimated economic market risk sensitivities of the net impact. Positive values represent an increase in the balance, and values in parentheses represent a decrease. Mismatches in changes in value of assets relative to liabilities represent an economic risk to the Group.

In determining the sensitivities, investments and liabilities are fully re-valued in the given scenarios. Each instrument is re-valued separately, taking the relevant product features into account. Non-linear effects, where they exist, are reflected in the model. The sensitivities are shown before tax. They do not include the impact of transactions within the Group.

Sensitivities for the rest of the business include Farmers, Group Finance and Operations, and Non-Core Businesses.

Risk review (continued)

Analysis of economic sensitivities for interest-rate risk

Table 4 shows the estimated net impact before tax of a 100 basis point increase/decrease in yield curves after consideration of hedges in place, as of December 31, 2018 and 2017.

Table 4			
Economic interest rate sensitivities*			
In USD millions, as of December 31		2018	2017
100 basis point increase in the interest rate yield curves			
Property and casualty		(180)	(278)
Life¹		655	244
Rest of the business		(192)	(275)
100 basis point decrease in the interest rate yield curves			
Property and casualty		(8)	100
Life¹		(2,103)	(1,127)
Rest of the business		151	236

¹ Modeling enhancements introduced in 2018 for the German Life business that extended the maximum maturity to 60 years compared to 40 years previously.

Analysis of economic sensitivities for equity risk

Table 5 shows the estimated net impact before tax from a 10 percent decline in stock markets, after consideration of hedges in place, as of December 31, 2018 and 2017.

Table 5			
Economic equity price sensitivities*			
In USD millions, as of December 31		2018	2017
10% decline in stock markets			
Property & Casualty		(593)	(642)
Life		(395)	(422)
Rest of the business		(83)	(74)

Analysis of economic sensitivities for credit spread risk

Table 6 shows the estimated net impact before tax from a 100 basis points increase in corporate credit spreads, as of December 31, 2018 and 2017. The sensitivities apply to all fixed income instruments, excluding government, supranational and similar debt securities. For Life business the loss-absorbing capacity of liabilities for losses on credit spreads are not included, as they are not modeled in the replicating portfolios.

Table 6			
Economic credit spread sensitivities*			
In USD millions, as of December 31		2018	2017
100 basis point increase in credit spreads			
Property & Casualty		(1,614)	(1,694)
Life		(3,048)	(3,095)
Rest of the business		(338)	(564)

* Limitations of the economic sensitivities: same limitations apply as for Group investments sensitivities, except that the above sensitivities are based on economic net assets including liability representation: see Note 1 of the consolidated financial statements.

Audited

Risks from defaults of counterparties

Debt securities

The Group is exposed to credit risk from third-party counterparties where the Group holds securities issued by those entities. The default risk is controlled by Group counterparty concentration risk limits keeping the size of potential losses to an acceptable level.

Table 7

Debt securities by
rating of issuer

as of December 31	2018		2017	
	USD millions	% of total	USD millions	% of total
Rating				
AAA	35,283	25.2%	37,426	25.2%
AA	37,362	26.7%	39,664	26.7%
A	20,998	15.0%	26,011	17.5%
BBB	39,529	28.3%	38,360	25.9%
BB and below	5,341	3.8%	6,033	4.1%
Unrated	1,357	1.0%	767	0.5%
Total	139,870	100.0%	148,261	100.0%

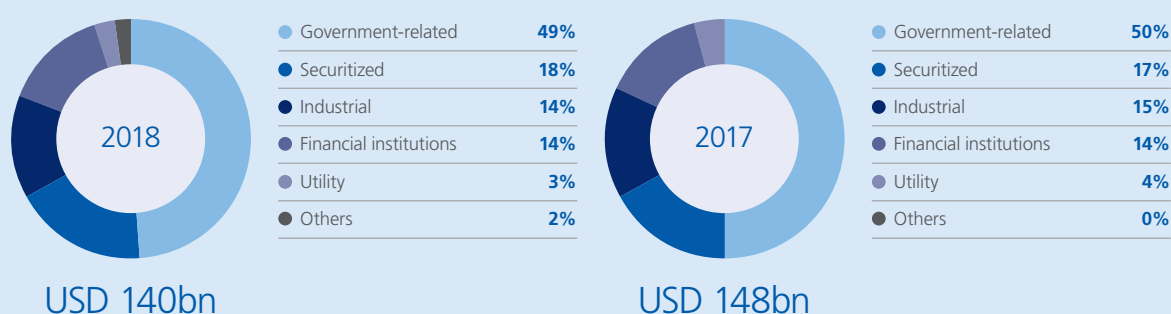
Table 7 shows the credit risk exposure of debt securities, by credit rating. As of December 31, 2018, 95.2 percent of the Group's debt securities was investment grade and 25.2 percent was rated 'AAA.' As of December 31, 2017, 95.4 percent of debt securities was investment grade and 25.2 percent was rated 'AAA.'

Exposure-level limits are in place and are based on default and recovery rates that tighten progressively for lower ratings. Where the Group identifies investments expected to trigger limit breaches, appropriate actions are implemented.

The risk-weighted average credit rating of the Group's debt securities portfolio is 'A-' in 2018, compared with 'A-' in 2017.

Debt securities – credit risk concentration by industry

%, as of December 31



As of December 31, 2018, the largest concentration in the Group's debt securities portfolio was government-related at 49 percent of all debt securities. In all other categories, a total of USD 31.4 billion (44 percent) was secured. As of December 31, 2017, 50 percent of the Group's debt portfolio was invested in government-related securities. In all other categories, a total of USD 30.0 billion (41 percent) was secured. Industry classifications in the fixed income portfolio were revised during 2018 to better align with the management view of the portfolio and financial industry practice. The 2017 figures were restated accordingly.

The second-largest concentration in the Group's debt securities portfolio is securitized, including structured finance securities and covered bonds.

Risk review (continued)

Audited

In addition to debt exposure, the Group had loan exposure of USD 4.4 billion and USD 4.9 billion to the German central government or the German federal states as of December 31, 2018 and 2017, respectively. For more information, see the 'mortgage loans and other loans' section.

Cash and cash equivalents

To reduce concentration, settlement and operational risks, the Group limits the amount of cash that can be deposited with a single counterparty. The Group also maintains an authorized list of acceptable cash counterparties.

Cash and cash equivalents amounted to USD 8.6 billion as of December 31, 2018 and USD 8.2 billion as of December 31, 2017. The risk-weighted average rating of the overall cash portfolio was 'A-' as of December 31, 2018 and December 31, 2017. The ten largest global banks represent 77 percent of the total, whose risk-weighted average rating was 'A+' as of December 31, 2018 and 'A' as of December 31, 2017.

Mortgage loans and other loans

Mortgage loans amounted to USD 6.6 billion as of December 31, 2018 and USD 7.0 billion as of December 31, 2017. The Group's largest mortgage loan portfolios are held in Switzerland (USD 3.4 billion) and in Germany (USD 2.3 billion); these are predominantly secured against residential property but also include mortgages secured by commercial property. The Group invests in mortgages in the U.S. (USD 0.6 billion); these are mainly participations in large mortgage loans secured against commercial property.

The credit risk arising from other loans is assessed and monitored together with the 'debt securities' portfolio. Out of the USD 7.6 billion reported loans as of December 31, 2018, 62 percent are government-related, of which 94 percent are to the German central government or the German federal states. As of December 31, 2018, USD 4.7 billion were rated as 'AAA' (61 percent) compared with 5.1 billion as of December 31, 2017; USD 0.7 billion as 'AA' (10 percent) compared with 0.7 billion as of December 31, 2017; USD 0.3 billion as 'A' (4 percent) compared to with 0.6 billion as of December 31, 2017; USD 1.2 billion as 'BBB' and below (16 percent) compared with 1.2 billion as of December 31, 2017; and USD 0.7 billion as unrated (10 percent) compared with 1.2 billion as of December 31, 2017.

Derivatives

The replacement value of outstanding derivatives represents a credit risk to the Group. These instruments include interest rate and cross-currency swaps, forward contracts and purchased options. A potential exposure could also arise from possible changes in replacement values. The Group regularly monitors credit risk exposures arising from derivative transactions. Outstanding positions with external counterparties are managed through an approval process embedded in derivative programs.

To limit credit risk, derivative financial instruments are typically executed with counterparties rated 'A-' or better by an external rating agency, unless collateral is provided as per Zurich's risk policy manuals. The Group's standard practice is to only transact derivatives with those counterparties for which the Group has in place an ISDA Master Agreement, with a Credit Support Annex. This mitigates credit exposures from over-the-counter transactions due to close-out netting and requires the counterparty to post collateral when the derivative position exceeds an agreed threshold. The Group further mitigates credit exposures from derivative transactions by using exchange-traded or centrally cleared instruments whenever possible.

Risk from currency exchange rates

Currency risk is the risk of loss resulting from changes in exchange rates. The Group operates internationally and therefore is exposed to the financial impact of changes in the exchange rates of various currencies. The Group's presentation currency is the U.S. dollar, but its assets, liabilities, income and expenses are denominated in many currencies, with significant amounts in euro, Swiss franc and British pound, as well as the U.S. dollar. On local balance sheets a currency mismatch may cause a balance sheet's net asset value to fluctuate, either through income or directly through equity. The Group manages this risk by matching foreign currency positions on local balance sheets within prescribed limits. Residual local mismatches are reported centrally to make use of the netting effect across the Group. Zurich hedges these residual local mismatches within an established limit through a central balance sheet. For information on net gains/losses on foreign currency transactions included in the consolidated income statements, see note 1 of the consolidated financial statements. The monetary currency risk exposure on local balance sheets is considered immaterial.

Differences arise when functional currencies are translated into the Group's presentation currency, the U.S. dollar. The Group applies net investment hedge accounting to protect against the impact that changes in certain exchange rates might have on selected net investments.

Audited

Table 8 shows the total IFRS equity's sensitivity to changes in exchange rates for the main functional currencies to which the Group is exposed. Positive values represent an increase in the value of the Group's total equity. See notes 1, 3 and 7 of the consolidated financial statements for additional information on foreign currency translation and transactions.

Table 8

	in USD millions, as of December 31	2018	2017
Sensitivity of the Group's total IFRS equity to exchange rate fluctuations	10% increase in		
	EUR/USD rate	336	467
	GBP/USD rate	215	245
	CHF/USD rate	350	447
	BRL/USD rate	163	147
	Other currencies/USD rates	624	645

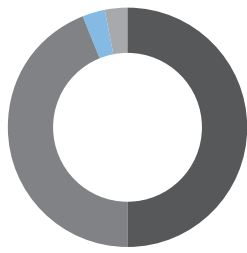
The sensitivities show the effects of a change of the exchange rates only, while other assumptions remain unchanged. The sensitivity analysis does not take into account management actions that might be taken to mitigate such changes. The sensitivities do not indicate a probability of such events occurring in the future. They do not necessarily represent Zurich's view of expected future market changes. While table 8 shows the effect of a 10 percent increase in currency exchange rates, a decrease of 10 percent would have the converse effect.

Risk review (continued)

Other credit risk

Section highlights

Total Z-ECM capital required: USD 30.7 billion
%, as of July 1, 2018



● Insurance risk	50%
● Market risk, including investment credit risk	44%
● Other credit risk	3%
● Operational risk	3%

Key risk and capital indicators

Z-ECM, in USD billions

	Q2 2018	Q2 2017
Reinsurance credit risk	0.9	0.9

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Credit risk is the risk associated with a loss or potential loss from counterparties failing to fulfill their financial obligations. See section 'risks from defaults of counterparties' for market-risk-related asset categories. The Group's exposure to other credit risk is derived from the following main categories of assets:

- ▶ Reinsurance assets
- ▶ Receivables

The Group's objective in managing credit risk exposures is to maintain them within parameters that reflect the Group's strategic objectives, and its risk appetite and tolerance. Sources of credit risk are assessed and monitored, and the Group has policies to manage specific risks within various subcategories of credit risk. To assess counterparty credit risk, the Group uses ratings assigned by external rating agencies, qualified third parties such as asset managers, and internal rating assessments. If external rating agencies' ratings differ, the Group generally applies the lowest, unless other indicators justify an alternative, which may be an internal credit rating.

The Group regularly tests and analyzes credit risk scenarios and prepares possible contingency measures that may be implemented if the credit risk environment worsens.

The Group actively uses collateral to mitigate credit risks. Nevertheless, underlying credit risks are managed independently from the collateral. The Group has limits and quality criteria to identify acceptable letter-of-credit providers. Letters of credit enable Zurich to limit the risks embedded in reinsurance captives, deductibles, trade credit and surety.

The Group has counterparty limits, which are regularly monitored. Exposure to counterparties' parent companies and subsidiaries is aggregated to include reinsurance assets, investments, derivatives, and for the largest counterparties, certain insurance products. There was no unapproved material exposure in excess of the Group's limits for counterparty aggregation as of December 31, 2018 nor December 31, 2017.

On-balance sheet exposures are the main source of credit risk. Off-balance sheet credit exposures are related primarily to certain insurance products, reinsurance and collateral used to protect underlying credit exposures on the balance sheet. The Group also has off-balance sheet exposures related to undrawn loan commitments of USD 2 million and USD 16 million as of December 31, 2018 and 2017, respectively. See note 22 of the consolidated financial statements for undrawn loan commitments.

Audited

Credit risk related to reinsurance assets

The Group's Corporate Reinsurance Security Committee manages the credit quality of cessions and reinsurance assets. The Group typically cedes new business to authorized reinsurers with a minimum rating of 'A-'. As of December 31, 2018 and 2017 respectively, 52 percent and 52 percent of the exposure ceded to reinsurers that are rated below 'A-' or are not rated, was collateralized. Of the exposure ceded to reinsurers that are rated below 'A-' or are not rated, 50 percent was ceded to captive insurance companies in 2018, and 51 percent in 2017.

Reinsurance assets included reinsurance recoverables (the reinsurers' share of reserves for insurance contracts) of USD 21.3 billion and USD 21 billion, and receivables arising from ceded reinsurance of USD 1.1 billion and USD 1.2 billion as of December 31, 2018 and 2017, respectively, gross of allowance for impairment. Reserves for potentially uncollectible reinsurance assets amounted to USD 113 million as of December 31, 2018 and USD 94 million as of December 31, 2017. The Group's policy on impairment charges takes into account both specific charges for known situations (e.g., financial distress or litigation) and a general, prudent provision for unanticipated impairments.

Reinsurance assets in table 9 are shown before taking into account collateral such as cash or bank letters of credit and deposits received under ceded reinsurance contracts. Unsecured reinsurance assets shown are after deducting collateral. Except for an immaterial amount, letters of credit are from banks rated 'A-' or better. Collateral increased by USD 0.2 billion to USD 9.6 per December 31, 2018, compared to previous year.

Table 9 shows reinsurance assets and unsecured reinsurance assets split by rating.

Table 9

as of December 31

Reinsurance assets and unsecured reinsurance assets by rating of reinsurer and captive

	2018				2017			
	Reinsurance assets		Unsecured reinsurance assets		Reinsurance assets		Unsecured reinsurance assets	
	USD millions	% of total	USD millions	% of total	USD millions	% of total	USD millions	% of total
Rating								
AAA	9	0.0%	9	0.1%	–	0.0%	–	0.0%
AA	5,633	25.3%	5,173	40.8%	5,939	26.9%	5,378	42.5%
A	10,882	48.9%	4,740	37.4%	10,562	47.9%	4,619	36.5%
BBB	1,572	7.1%	983	7.8%	1,634	7.4%	974	7.7%
BB	447	2.0%	232	1.8%	247	1.1%	57	0.5%
B and below	645	2.9%	37	0.3%	638	2.9%	168	1.3%
Unrated	3,085	13.9%	1,510	11.9%	3,036	13.8%	1,446	11.4%
Total¹	22,273	100.0%	12,685	100.0%	22,056	100.0%	12,642	100.0%

¹ The value of the collateral received amounts to USD 9.6 billion and USD 9.4 billion as of December 31, 2018 and 2017, respectively.

Credit risk related to receivables

The Group's largest credit-risk exposure to receivables is related to third-party agents, brokers and other intermediaries. It arises where premiums are collected from customers to be paid to the Group, or to pay claims to customers on behalf of the Group. The Group has policies and standards to manage and monitor credit risk related to intermediaries. The Group requires intermediaries to maintain segregated cash accounts for policyholder money. The Group also requires that intermediaries satisfy minimum requirements of capitalization, reputation and experience, and provide short-dated business credit terms.

Receivables that are past due but not impaired should be regarded as unsecured, but some of these receivable positions may be offset by collateral. The Group reports internally on Group past-due receivable balances and strives to keep the balance of past-due positions as low as possible, while taking into account customer satisfaction.

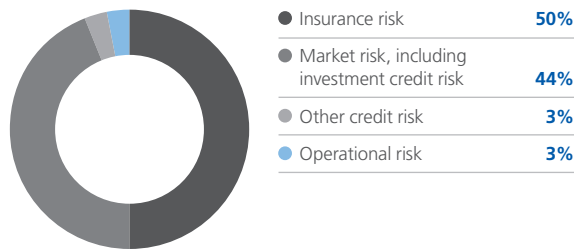
Receivables from ceded reinsurance are part of reinsurance assets and are managed accordingly. See notes 15 and 24 of the consolidated financial statements for additional information on receivables.

Risk review (continued)

Operational risk

Section highlights

Total Z-ECM capital required: USD 30.7 billion
%, as of July 1, 2018



Key risk and capital indicators

Z-ECM, in USD billions

	Q2 2018	Q2 2017
Operational risk	1.0	0.9

Audited

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, systems or from external events such as external fraud, catastrophes, or failure in outsourcing arrangements. Zurich has a framework to identify, assess, quantify, mitigate, monitor and report operational risk within the Group. Within this framework, the Group:

- ▶ Uses a scenario-based approach to assess, model and quantify the capital required for operational risk for business units under extreme circumstances. This approach allows information to be compared across the Group and highlights the main scenarios contributing to the Z-ECM capital required.
- ▶ Documents and reviews loss events exceeding a threshold determined per Zurich's risk policy manuals. Remedial action is taken to avoid a recurrence of such operational loss events.
- ▶ Conducts risk assessments where operational risks are identified for key business areas. Risks identified and assessed above a certain threshold must be mitigated. Risk mitigation plans are documented and tracked on an ongoing basis. In the assessments, the Group uses such sources of information as the Total Risk Profiling™ process, internal control assessments, and audit findings, as well as scenario modeling and loss event data.

The Group has specific processes and systems in place to focus on high-priority operational matters such as managing information security and third-party suppliers, as well as combating fraud.

Managing information security, including cyber risk, remains a key focus for Zurich. To measure the global exposure to this risk, a dedicated framework has been established, resulting in substantial improvements achieved throughout the year. As part of the introduction of this framework, capability upgrading took place across the risk function and increased emphasis on risk types resulting from the digital transformation the Group is progressing, notably focusing on information security, emerging technologies, innovation, and third party management.

Our customer focused organization, with enhanced capabilities and increased attention to operational resilience, maintains our core business services by upgrading our continuous reviews and assurance around our existing business continuity program. Zurich pays increasing attention to the protection and privacy of data for all of our stakeholders. We have done this by revising corresponding risk policies and governance, which has led to a more precise alignment to new legal and regulatory requirements and the changing operating environments.

With the increased use of third parties and suppliers and in conjunction with continual upgrades to regulatory requirements, we provide greater support to the organization in supporting third party and supplier risk management practices. This is in conjunction with a continued focus on critical suppliers, identifying the risks and obtaining assurance over key controls to confirm that they are able to deliver services as required throughout the lifecycle of the sourcing arrangements. Assessments include ensuring that suppliers remain financially viable, comply with our security and resilience requirements, and limit the Group's exposure to geographic and supplier concentration risks.

Preventing, detecting and responding to fraud are embedded in Zurich's business. Both claims and non-claims fraud are included in the common framework for assessing and managing operational risks. For Z-ECM calculations, claims fraud is part of insurance risk and non-claims fraud is part of operational risk.

Risk management and internal controls

The Group considers internal control to be key for managing operational risk. The Board has overall responsibility for the Group's risk management and internal control frameworks. The objectives of the Group's internal control system are to provide reasonable assurance that Zurich's financial statements and disclosures are materially correct, support reliable operations, and to ensure legal and regulatory compliance. The internal control system is designed to mitigate rather than eliminate the material risk that business objectives might not be met. Key controls are assessed for their design and operating effectiveness.

The Group promotes risk awareness and understanding of controls with communication and training. Key risk management and internal control systems are designed at Group level and implemented Group-wide.

Management, as the first line of defense, is responsible for identifying, evaluating and addressing significant risks, and designing, implementing and maintaining internal control. Key processes and controls in the organization are subject to review and challenge by management, Group Risk Management, Group Compliance and Group Audit. Control issues of Group-level significance and associated mitigation actions are reported regularly to the Audit Committee of the Board. The Risk and Investment Committee of the Board reviews the effectiveness of the Group's risk management system, including the Group's risk tolerance and enterprise-wide risk governance framework, in accordance with the charter for each committee.

The Group's Disclosure Committee, chaired by the Head of Group Financial Accounting and Reporting, assesses the content, accuracy and integrity of the disclosures and the effectiveness of the internal controls over financial reporting. The conclusions result in a recommendation to the Group Chief Financial Officer to release the financial disclosures to the Audit Committee of the Board, which may challenge further. The Board reviews and approves the announcement of the results and the annual report before they are made public.

The internal and external auditors also regularly report conclusions, observations and recommendations that arise as a result of their independent reviews and testing of internal controls over financial reporting and operations.

Risk review (continued)

Audited

Liquidity risk

Liquidity risk is the risk that the Group may not have sufficient liquid financial resources to meet its obligations when they fall due, or would have to incur excessive costs to do so. Zurich's policy is to maintain adequate liquidity and contingent liquidity to meet its liquidity needs under normal conditions and in times of stress. To achieve this, the Group assesses, monitors and manages its liquidity needs on an ongoing basis.

Group-wide liquidity management policies and specific guidelines govern how local businesses plan, manage and report their local liquidity and include regular stress tests for all major carriers within the Group. The stress tests use a standardized set of internally defined stress events, and are designed to provide an overview of the potential drain on liquidity if the Group had to recapitalize local balance sheets. Similar guidelines apply at the Group level, and detailed liquidity forecasts are regularly conducted, based on local businesses' input and the Group's forecasts. As part of its liquidity management, the Group maintains sufficient cash and cash equivalents and high-quality, liquid investment portfolios to meet outflows under expected and stressed conditions. The Group also maintains internal liquidity sources that cover the Group's potential liquidity needs, including those that might arise in times of stress. The Group takes into account the amount, availability and speed at which these sources can be accessed. The Group has access to diverse funding sources to cover contingencies, including asset sales, external debt issuance and making use of committed borrowing facilities or letters of credit. The Group maintains a range of maturities for external debt securities. A potential source of liquidity risk is the effect of a downgrade of the Group's credit rating. This could affect the Group's commitments and guarantees, potentially increasing liquidity needs. This risk, and mitigating actions that might be employed, are assessed on an ongoing basis within the Group's liquidity framework.

The Group regularly analyzes the liquidity of the investment assets, and monitors that the liquidity of assets stays in line with the liquidity needs. During 2018, the Group was within its capacity to hold illiquid assets.

For more information on debt obligation maturities, see note 18 of the consolidated financial statements, and for information on commitments and guarantees, see note 22 of the consolidated financial statements.

The Group's ongoing liquidity monitoring includes regular reporting to the executive management and quarterly reporting to the Risk and Investment Committee of the Board, covering aspects such as the Group's actual and forecast liquidity, possible adverse scenarios that could affect the Group's liquidity and possible liquidity needs from the Group's main subsidiaries, including under conditions of stress.

For more information on the Group's other financial liabilities, see note 16 of the consolidated financial statements. See note 6 of the consolidated financial statements for information on the maturity of debt securities.

The Group has committed to contribute capital to subsidiaries and third parties that engage in making investments in direct private equity and private equity funds. Commitments may be called by the counterparty over the term of the investment (generally three to five years) and must be funded by the Group on a timely basis. See note 22 of the consolidated financial statements.

Audited

Strategic risk and risks to the Group's reputation

Strategic risk

Strategic risk corresponds to the risk that Zurich is unable to achieve its strategic targets.

Strategic risks can arise from:

- ▶ Inadequate risk-reward assessment of strategic plans
- ▶ Improper implementation of strategic plans
- ▶ Unexpected changes to underlying assumptions

Zurich defines the strategy as the long-term plan of action designed to allow the Group to achieve its goals and aspirations based on Zurich's purpose and values and strategic options.

The Group works to reduce unintended risks of strategic business decisions through its risk assessment processes and tools, including the Total Risk Profiling™ process. As part of the annual assessment of strategic risks, the Executive Committee (ExCo) assessed potential risks from both external and internal factors, looking at 2019 and beyond. These include: macro-economic risks such as financial stress due to geopolitical uncertainties and monetary policy; long-term capital and liquidity impacts of new post Brexit regulatory regime in the UK; changes affecting competitiveness in markets where Zurich is active; information security including cyber risks and digital transformation. The ExCo defined actions to respond as appropriate and reviews changes to the key risks and their status of actions at least quarterly.

The Group evaluates the risks of M&A transactions both from a quantitative and a qualitative perspective. The Group conducts risk assessments of M&A transactions to evaluate risks specifically related to integrating acquired businesses.

Risks to the Group's reputation

Risks include acts or omissions by the Group or any of its employees that could damage the Group's reputation or lead to a loss of trust among its stakeholders. Every risk type has potential consequences for Zurich's reputation. Effectively managing each type of risk helps reduce such threats.

The Group aims to preserve its reputation by adhering to applicable laws and regulations, and by following the core values and principles of the Group's code of conduct, which promotes integrity and good business practice. The Group centrally manages certain aspects of reputation risk, for example, communications, through functions with the appropriate expertise.

Climate-change risk

The Total Risk Profiling™ is the Group's primary tool to assess strategic risks throughout the Group and in 2018 was used to update our climate risk assessment. The assessment confirmed that both physical and transition risks remain manageable and foreseeable near-term (less than five years), whereas long-term risks (5–10 years and beyond) remain elevated and highly uncertain. In our current assessment, long-term risks are more likely to be driven by physical effects of climate change, in line with our climate risk score card which suggests that transition to a two-degree scenario became less likely in 2018.

More information can be found in Zurich's [TCFD disclosure](#) and in our report [Managing the impacts of climate change: risk management responses](#).

Risk review (continued)

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