

*somewhat  
different*

Hannover Re

2018

# Solvency and Financial Condition Report

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## Executive Summary

### Key figures

in TEUR	2018	2017
<b>Solvency II Balance Sheet</b>		
Assets	53,243,298	49,885,316
Technical Provisions	32,487,695	30,432,579
Other Liabilities	8,346,763	7,381,498
Excess of Assets over Liabilities	12,408,840	12,071,239
<b>Eligible Own Funds</b>		
Tier 1 Basic Own Funds (unrestricted)	10,935,567	10,635,845
Tier 1 Basic Own Funds (restricted)	538,136	534,858
Tier 2 Basic Own Funds	1,079,007	1,091,286
Tier 3 Own Funds	81,848	33,777
Eligible Own Funds (SCR)	12,634,559	12,295,766
<b>Capital Requirements</b>		
Solvency Capital Requirement	5,135,387	4,729,028
Minimum Capital Requirement	3,542,422	3,303,225
<b>Coverage Ratio</b>		
Ratio of Eligible Own Funds to SCR (Solvency Ratio)	246%	260%
Ratio of Eligible Own Funds to MCR	344%	358%

Hannover Re Group (hereinafter referred to as “Hannover Re” or “the Group”) fulfils the minimum and solvency capital requirements (hereinafter referred to as MCR and SCR) stipulated by the supervisory authority as at the reporting date 31 December 2018 and in the financial year 2018. The coverage ratio of the SCR ranges above 200% during the entire financial year.

Please note that this report represents a voluntary publication of the Hannover Re Group.

Please note that rounding differences can occur in the presented tables.

## A. Business and Performance

With a gross premium volume of TEUR 19,176,358 (TEUR 17,790,506), Hannover Re is the fourth-largest reinsurer in the world. Hannover Re transacts all lines of Property & Casualty and Life & Health reinsurance. Its global presence and activities across all lines of reinsurance business allows the company to achieve an efficient risk diversification.

We are thoroughly satisfied with the development of business in the 2018 financial year. With Group net income of TEUR 1,059,493 (TEUR 958,555) we actually surpassed the anticipated level of more than TEUR 1,000,000.

We are satisfied with the result in property and casualty reinsurance. After the considerable large loss expenditure of the previous year, the underwriting result including interest and expenses on funds withheld and contract deposits improved to TEUR 372,837 (TEUR 15,477).

The result posted in life and health reinsurance was adversely affected in the year under review by one-time charges associated with treaty recaptures in our legacy US mortality portfolio. This contrasted with, among other things, the positive underlying development of our business in international life and health reinsurance.

The operating profit (EBIT) rose by 12.5% to TEUR 275,890 (TEUR 245,210) on the back of the good underlying risk experience. The improved profitability is pleasing because the aforementioned recaptures in legacy US mortality business gave rise to a one-off charge to the result, but further strains going forward are thereby largely eliminated.

Bearing in mind the challenging market environment, we are very satisfied with the development of our investments as at 31 December 2018. Despite the low level of interest rates, ordinary investment income excluding interest on funds withheld and contract deposits again surpassed the previous year at TEUR 1,321,712 (TEUR 1,289,033). Net realised gains on investments as at 31 December 2018 decreased significantly from TEUR 377,093 to TEUR 127,659. This can be attributed mainly to last year's liquidation of our equity portfolio. The net realised gains are back to normal levels now. Thus, income from assets under own management decreased 14.1% to TEUR 1,322,042 (TEUR 1,538,973). The impairments taken in the year under review were again only minimal. The resulting annual return amounted to 3.2% (3.8%). We had forecast a level of 2.7%. Investment income including interest on funds withheld and contract deposits decreased to TEUR 1,530,029 (TEUR 1,773,889), a decrease of 13.7% relative to the previous year. Interest on funds withheld and contract deposits totalled TEUR 207,988 (TEUR 234,915).

## B. System of Governance

Hannover Re has an effective system of governance, which provides for sound and prudent management. Written guidelines are in place for all significant business events. The key functions pursuant to Section 26 and Sections 29-31 of the Insurance Supervision Act (VAG) have been set up, entrusted with the tasks described and equipped with appropriate resources.

In 2018, there have been no significant changes to the system of governance. The focus was on revisions and improvements of existing guidelines including the Risk and Capital Management Guideline as well as the Emerging Risk Guideline.

The Executive Board has established a committee which supports the assessment of the system of governance. Based on the assessment conducted by the committee, the Executive Board has

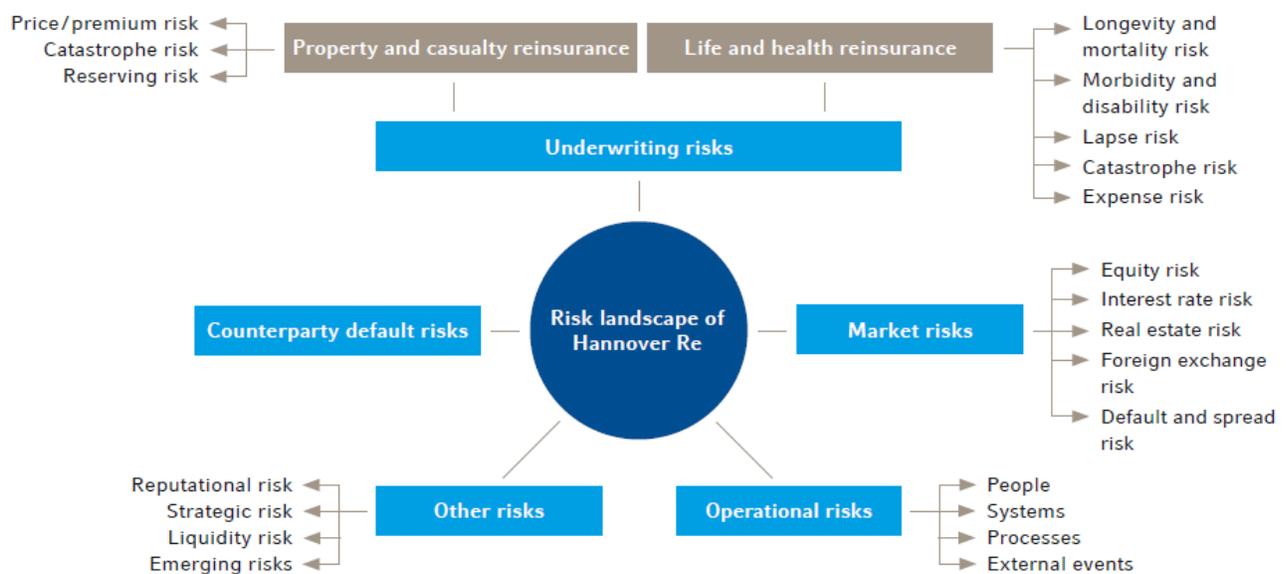
reached the conclusion that the system of governance of Hannover Re is appropriate considering the scope and complexity of its business activities and the inherent risks.

The individual elements of the system of governance of Hannover Re are explained in Section B.

### C. Risk Profile

In the context of its business operations Hannover Re enters into a broad variety of risks. These risks are deliberately accepted, steered and monitored. They specifically concern underwriting risks pertaining to Property & Casualty and Life & Health as well as capital market risks, liquidity risks and counterparty default risks. Operational, strategic and reputational risks also arise in the course of business operations. We describe the sources of these risks and how we deal with them in Section C. We also explain how we handle potential future risks (emerging risks).

#### Risk landscape of Hannover Re



Hannover Re received approval from the regulatory authorities to calculate its solvency requirements using an internal capital model. Hannover Re was also granted approval by the BaFin in 2018 to use static volatility adjustments to value its liabilities starting due date 31 December 2018.

The solvency capital requirements (SCR) as of 31 December 2018 are shown in the following table. The SCR as per 31 December 2018 include the impact from the static volatility adjustments. The impact is low and displayed separately in section D.2 as well as in the annex QRT S.22.01.22.

**Solvency Capital Requirement (SCR)**  
in TEUR

Solvency Capital Requirement	2018	2017
Underwriting risk - Property & Casualty	3,819,254	3,485,449
Underwriting risk - Life & Health	2,212,474	2,354,658
Market risk	3,833,472	3,462,193
Counterparty default risk	312,553	281,958
Operational risk	575,329	637,035
Diversification	-3,648,048	-3,710,212
<b>Total risk (pre-tax)</b>	<b>7,105,035</b>	<b>6,511,081</b>
Deferred tax	1,969,648	1,782,052
<b>Total risk (post-tax)</b>	<b>5,135,387</b>	<b>4,729,028</b>

The required capital is calculated based on the approved internal model. At the present time our most significant risks are the default and spread risks within the market risks, the reserving and catastrophe risks within the underwriting risks of property and casualty reinsurance and the risk of changes in mortality within the underwriting risks of life and health reinsurance. With regard to mortality risks, as a general principle annuity portfolios are adversely impacted by improvements in mortality while death benefit portfolios are adversely affected by deteriorations in mortality.

Overall, the required capital increased in the course of the year. This was mainly driven by the larger business volumes, which led to an increase in market risks and underwriting risks in property and casualty reinsurance. In addition, the weakening of the euro against the US dollar contributed to a rise in foreign-currency volumes and an increase in risks in euro.

Along with the larger volumes, elevated default and spread risks – as are also evident in the generally higher credit spread levels – are a major reason for the increase in market risks. The underwriting risks in property and casualty reinsurance increased primarily as a consequence of higher underwriting capacities for natural perils and model adjustments made to specific large loss models. The underwriting risks in life and health reinsurance decreased due to a reduced exposure to longevity and mortality risks. This contrasts with a higher exposure to morbidity risks resulting from expansion of the business. The increase in counterparty default risks can mainly be attributed to a higher volume of receivables due from ceding companies and retrocessionaires as well as elevated volatility of the modelled losses along with generally increased credit spreads. The decrease in operational risks can be attributed above all to an updated expert assessment regarding the impact of individual scenarios, partially offset by a larger business volume.

Hannover Re is prepared for United Kingdom's withdrawal from the EU. A working group has been set up to address readiness measures. In order to continue the activities of the materially affected Hannover Re Life UK Branch, an application under the so-called temporary permissions regime (TPR) has been filed and already approved by the financial regulator. Argenta Holdings Limited is a wholly owned subsidiary of Hannover Re that operates on a stand-alone basis in the UK and is already authorized as a member of Lloyd's. For our reinsurance business in the UK which we write through companies in Hannover, Ireland and Bermuda we do not anticipate any significant changes as a result of Brexit.

In order to avert the increased burden of taxation due to changes in tax legislation adopted by the US administration we have already undertaken some restructuring activities within the Group. US life reinsurance business previously written through Hannover Re Ireland was transferred to a Bermuda-based subsidiary. The latter is subject to US taxation, thereby avoiding a substantial tax loss; the solvency ratio decreased, however, due to a higher risk margin for Hannover Re.

The main monitoring and control mechanisms are presented in section C.

#### **D. Valuation for Solvency Purposes**

For the purposes of calculating the eligible own funds, Hannover Re values the assets and liabilities pursuant to the provisions of Sections 74 et seq. of the Insurance Supervision Act (VAG), i.e. in accordance with Solvency II. The valuation method is described in detail in Section D. In the first part, the valuation of assets and liabilities other than Technical Provisions is covered. The second part is broken down into two sub-sections, in which the valuation of the technical provisions for Property & Casualty reinsurance and Life & Health reinsurance are explained separately.

Hannover Re was granted approval by the BaFin in 2018 to use volatility adjustments to value the Best Estimate Liability (BEL) beginning with 31 December 2018.

The valuation for Solvency purposes is set in principle at the fair value (market value). Insofar as IFRS values appropriately reflect the fair value of individual assets or liabilities, they are applied.

Technical provisions pursuant to Solvency II differentiate significantly from the definition of provisions pursuant to the International Financial Reporting Standards (IFRS), both in terms of structure and in relation to the calculation rules. A comparison of IFRS and Solvency II Technical Provisions is shown as well as a comparison of current Technical Provisions under Solvency II and those calculated last year.

Section D explains the details of the valuation for solvency purposes.

#### **E. Capital Management**

Hannover Re's Solvency Ratio amounted to 246% as of reporting date 31 December 2018. Hannover Re endeavours at all times to maintain a Solvency Ratio of at least 180%, and thus exceeds the requirements of 100% stipulated by the supervisory authority. In addition, a threshold value of 200% has been defined. If the Solvency Ratio falls below this threshold value Hannover Re will adopt capital measures aimed at either strengthening the company's equity or reducing the risk capital, or both.

The Solvency Ratio is continuously monitored and also assessed as part of planning activities and in the event of large transactions. During the financial year 2018, the Solvency Ratio ranges at any point in time considerably above the threshold value of 200%. Further information on the calculation of the Solvency Ratio can be found in Section E.

Own funds in the Solvency II balance sheet consist of basic own funds, which comprise the excess of assets over liabilities, subordinated loans and net deferred tax assets. Ancillary own funds were not in use by Hannover Re as at 31 December 2018.

Hannover Re uses an approved full internal model for the purposes of calculating the Solvency Capital Requirement (SCR). The individual risk categories are aligned with the risk modules of the standard formula. The internal model is applied in a broad range of management and decision-making processes. The future development of Solvency and Minimum Capital Requirements are forecast at regular intervals as part of the planning process.

Section E explains the details of capital management.

## A. Business and Performance

### A.1 Business

#### A.1.1 Business model

With a gross premium volume of more than TEUR 19,176,358, the Hannover Re Group is the fourth-largest reinsurer in the world. Hannover Rück SE is a European Company, Societas Europaea (SE), based in Hannover, Germany. We transact reinsurance in our Property & Casualty and Life & Health business groups.

The strategy pursued in both property & casualty and life & health reinsurance supports our Group's paramount mission, namely: "creating value through reinsurance". Our entire business operations are geared to our goal of being the best option for our business partners when they come to choose their reinsurance provider. It is for this reason that our clients and their concerns form the focus of our activities.

We generate competitive advantages to the benefit of our clients and shareholders by conducting our reinsurance business with lower administrative expenses than our rivals. In this way we deliver above-average profitability while at the same time being able to offer our customers reinsurance protection on competitive terms.

We also strive for the broadest possible diversification and hence an efficient risk balance. This is achieved by accepting reinsurance risks with mostly little or no correlation in our Property & Casualty and Life & Health business groups across all lines of business as well as by maintaining a global presence. In conjunction with our capital management, this is the key to our comparatively low cost of capital.

Guided by a clearly defined risk appetite, our risk management steers the company so as to be able to act on business opportunities while securing our financial strength on a lasting basis.

Our subsidiary E+S Rückversicherung AG (E+S Rück), as the dedicated reinsurer for the German market, offers a range of products and services tailored to the specific features of the German market. Of special importance here are the mutual insurers with whom we maintain a strategic partnership that is underscored through their participation in E+S Rück.

In the Property & Casualty reinsurance business group we consider ourselves to be a reliable, flexible and innovative market player that ranks among the best in any given market. Cost leadership, effective cycle management and superior risk management are the key elements of our competitive positioning.

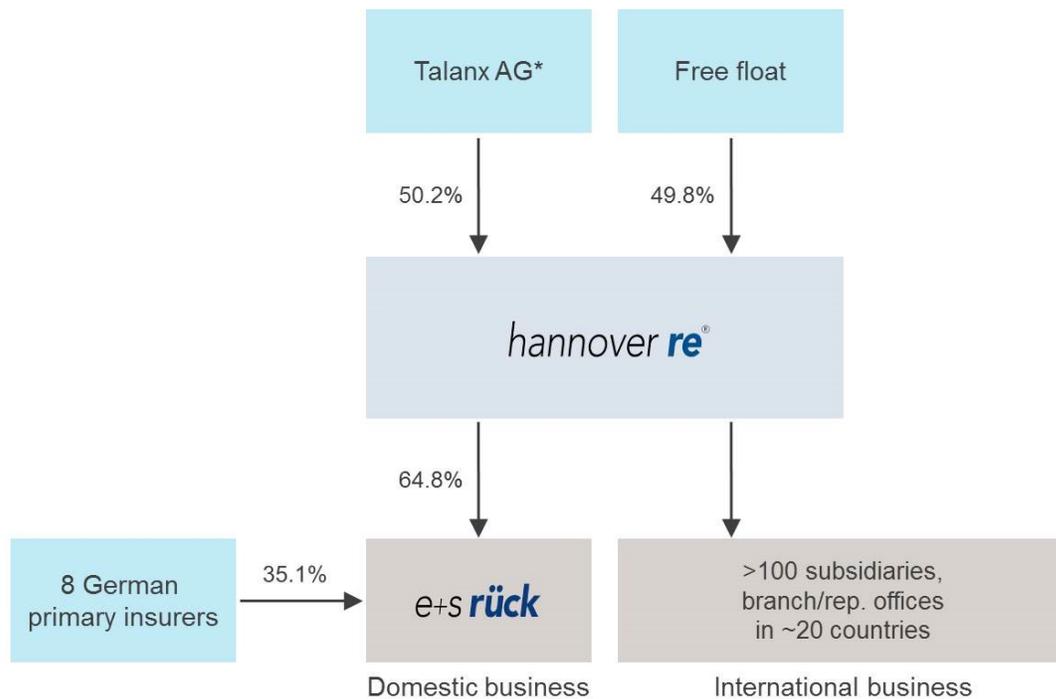
In the Life & Health reinsurance business group we are recognised – as customer surveys confirm – as one of the top players and a leading provider of innovative solutions. We achieve this standing by opening up new markets for our company and by identifying trends in order to anticipate the future needs of our customers.

#### A.1.2 Headquarters, supervisors and auditors

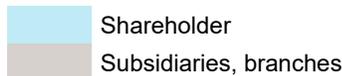
Hannover Rück SE – as the parent company of the Hannover Re Group – is a European stock corporation, Societas Europaea (SE), with its headquarters located in Karl-Wiechert-Allee 50, 30625 Hannover, Germany, and has been entered in the Commercial Register of the District Court

of Hannover under the number HR Hannover B 6778. A rounded 50.2% of Hannover Rück SE shares are held by Talanx AG, Hannover, which in turn is majority-owned – with an interest of 79.0% – by HDI Haftpflichtverband der Deutschen Industrie V.a.G. (HDI), Hannover.

**Shareholder, subsidiaries and branches**



\* Majority shareholder HDI V.a.G.



Hannover Re as well as Talanx and HDI are subject to the

Federal Financial Supervisory Authority (BaFin)  
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 Germany

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 De-Mail: [poststelle@bafin.de-mail.de](mailto:poststelle@bafin.de-mail.de)

The Group auditor appointed for Hannover Re within the meaning of Section 318 of the German Commercial Code (HGB) is PricewaterhouseCoopers GmbH, Wirtschaftsprüfungsgesellschaft, Fuhrberger Straße 5, 30625 Hannover.

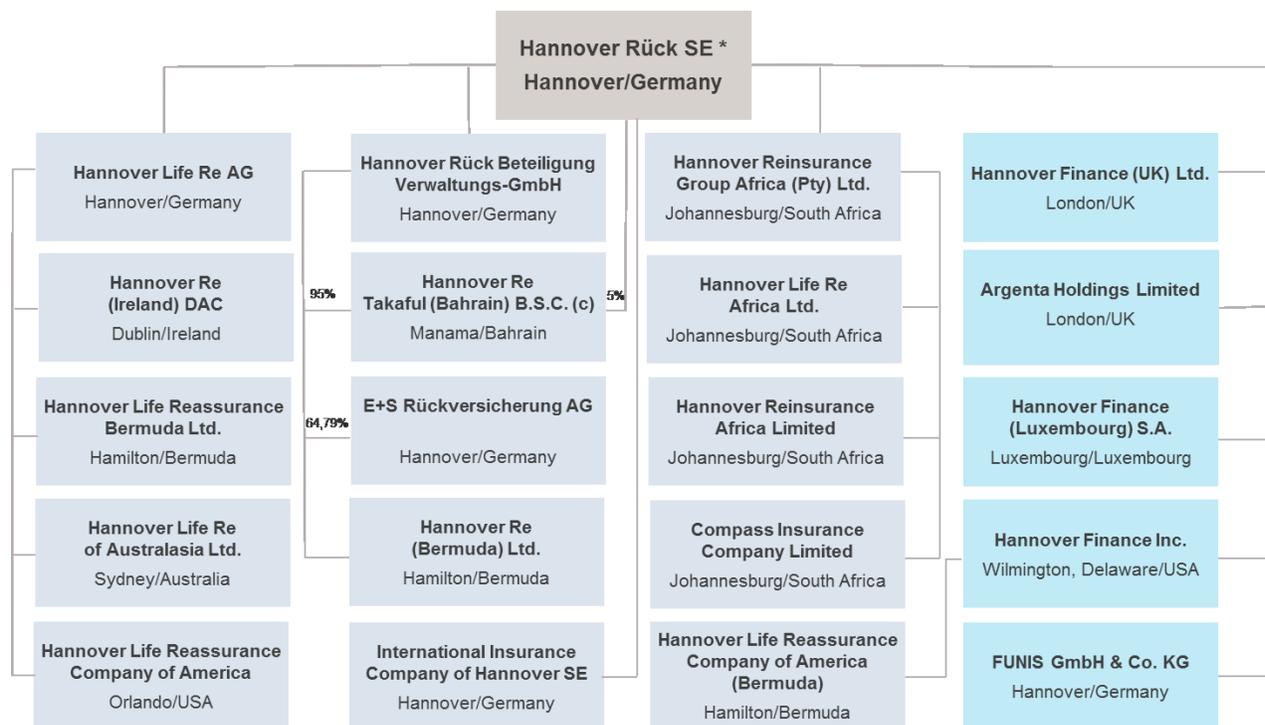
### A.1.3 Group structure

Hannover Rück SE (hereinafter referred to as “Hannover Rück”) and its subsidiaries (collectively referred to as the “Hannover Re Group” or “Hannover Re”) transact all lines of property & casualty and life & health reinsurance. We are present on all continents.

The company’s network consists of more than 100 subsidiaries, affiliates, branches and representative offices worldwide with 3,317 staff. The Group’s German business is conducted by the subsidiary E+S Rückversicherung AG.

Hannover Re and HDI Global have concentrated their primary insurance activities in specialty lines in a new joint venture named HDI Global Specialty SE. The majority interest (50.2%) in Inter Hannover was acquired by HDI Global for this purpose. HDI Global Specialty SE commenced operational activities on 1 January 2019 and writes agency business and specialty insurance in a range of lines including errors & omissions liability insurance, directors’ and officers’ (D & O) liability insurance, legal expenses, sports and entertainment, aviation and offshore energy. Hannover Re will continue to reinsure a large portion of the business written by HDI Global Specialty SE.

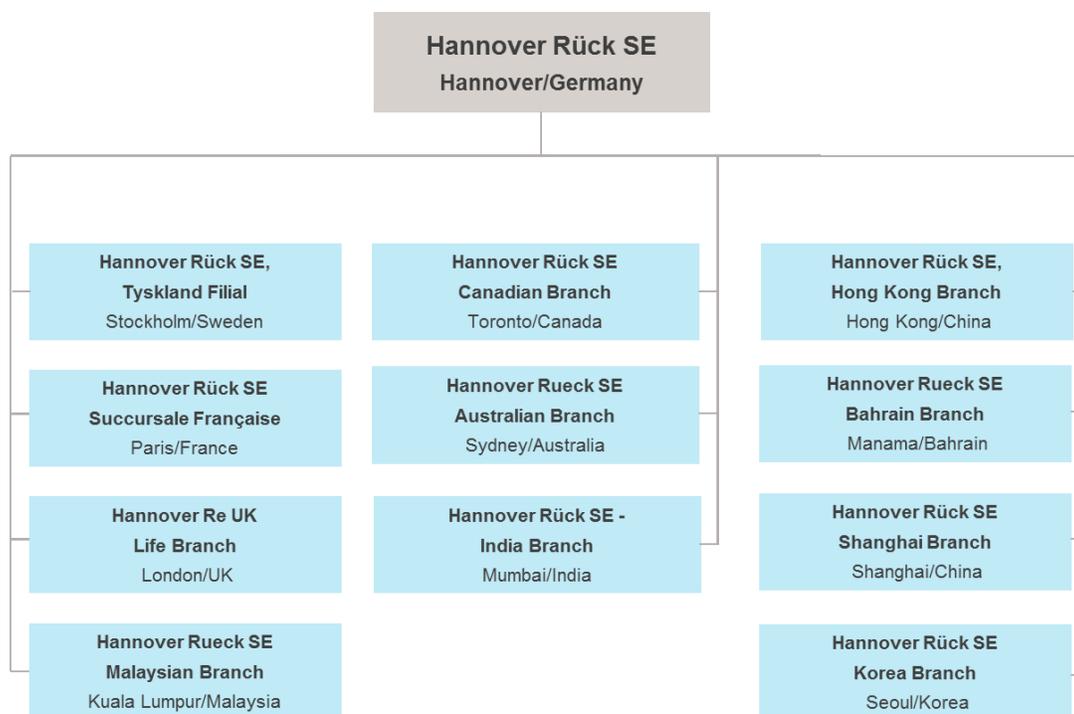
#### Subsidiaries of Hannover Rück



\* Unless otherwise stated, the shareholding is 100%.

- Reinsurance or Insurance companies
- Non-insurance companies

## Branches of Hannover Rück



## A.2 Performance

The development of business in 2018 was impacted by, among other factors, major loss expenditure in excess of the expected level – albeit considerably lower than the heavy burden incurred in the previous year – and one-time charges resulting from steps taken to improve our US mortality business in life and health reinsurance. The group net income improved by 10.5% to EUR 1,059.5 million (previous year: EUR 958.6 million) and is thus in line with our guidance of more than EUR 1 billion. This performance was supported by better-than-expected investment income.

We are satisfied with the result in property and casualty reinsurance. After the considerable large loss expenditure of the previous year, the underwriting result including interest and expenses on funds withheld and contract deposits improved to EUR 372.8 million (EUR 15.5 million).

The result posted in life and health reinsurance was adversely affected in the year under review by one-time charges associated with treaty recaptures in our legacy US mortality portfolio. The Group net income for our Life & Health reinsurance business group increased by 7.7% to EUR 185.9 million (EUR 172.6 million).

Capital markets once again proved to be difficult and challenging in 2018. With this in mind, we are thoroughly satisfied with the development of our investments as at 31 December 2018. Our portfolio of investments under own management grew to EUR 42.2 billion (31 December 2017: EUR 40.1 billion). Exchange rate effects and the issuance of a bond in the second quarter more than offset the valuation declines on fixed-income securities. The operating cash flow of more than EUR 2 billion is a pivotal factor in the portfolio growth.

In addition, the following table shows the performance targets for the business years 2018 and the attained results.

Business group	Key data	Targets for 2018	2018
Group	Investment return <sup>1</sup>	≥ 2.7%	3.2%
	Return on equity <sup>2</sup>	≥ 9.4%	12.2%
	Growth on earnings per share	≥ 5%	10.5%
	Economic value creation <sup>3,12</sup>	≥ 6.4%	8.1%
	Solvency ratio <sup>4,12</sup>	≥ 200%	245.7%
Property & Casualty reinsurance	Gross premium growth	3-5% <sup>5</sup>	16.2%
	Combined ratio	≤ 96% <sup>6</sup>	96.5%
	EBIT margin <sup>7</sup>	≥ 10%	12.2%
	xRoCA <sup>8</sup>	≥ 2%	9.0%
Life & Health reinsurance	Gross premium growth	3-5% <sup>9</sup>	4.6%
	Value of New Business (VNB) <sup>10</sup>	≥ EUR 220 million	EUR 290 million
	EBIT growth <sup>12</sup>	≥ 5% <sup>11</sup>	12.5%
	xRoCA <sup>8</sup>	≥ 2%	-2.4%

<sup>1</sup> Excluding effects from ModCo derivatives

<sup>2</sup> After tax; target: 900 basis points above the five-year average return on ten-year German government bonds

<sup>3</sup> Growth in the economic equity including dividend paid

Target: 600 basis points above the five-year average return on ten-year German government bonds

<sup>4</sup> In accordance with our internal capital model and Solvency II requirements

<sup>5</sup> Average over the reinsurance cycle; at constant exchange rates

<sup>6</sup> Including large loss budget of EUR 825 million

<sup>7</sup> EBIT / net premium earned

<sup>8</sup> Value contribution relative to allocated economic capital

<sup>9</sup> Organic growth only; target: annual average growth over a three-year period; at constant exchange rates

<sup>10</sup> Based on Solvency II principles; pre-tax reporting

<sup>11</sup> Annual average growth over a three-year period

<sup>12</sup> Strategic target since the 2018 financial year

For further information regarding our performance please refer to our Annual Report. You can receive the Annual Report at Hannover Rück SE, Karl-Wiechert-Allee 50, 30625 Hannover, or via download from our homepage (<https://www.hannover-re.com/1380256/annual-report-2018.pdf>).

## B. System of Governance

### B.1 General Information on the System of Governance

The Hannover Re Group has an effective system of governance in place which provides for sound and prudent management. The main elements of the System of Governance are described in the following sections.

#### B.1.1 Governance structure

##### B.1.1.1 Our administrative, management or supervisory body

Our administrative, management or supervisory body consists of the Executive Board and the Supervisory Board.

##### Executive Board

The Executive Board consists of no less than two persons. Furthermore it is up to the Supervisory Board to determine the number of members of the Executive Board. The members of the Executive Board are appointed by the Supervisory Board for a term of five years.

The following overview shows the allocation of the areas of responsibility to the members of the Executive Board.

##### Members of the Executive Board

Chairman	Chief Financial Officer	Property & Casualty Reinsurance			Life & Health Reinsurance	
Ulrich Wallin	Roland Vogel	Dr. Michael Pickel	Sven Althoff	Jürgen Gräber (until 9 November 2018)	Claude Chèvre	Dr. Klaus Miller
Innovation Management	Finance and Accounting	Group Legal Services	Specialty Lines Worldwide: Marine, Aviation, Credit, Surety and Political Risks, UK, Ireland, London Market and Direct Business	Coordination of Property & Casualty Business Group	Life & Health Reinsurance: Africa, Asia, Australia / New Zealand, Latin America, Western and Southern Europe,	Life & Health Reinsurance: UK, Ireland, North America, Northern, Eastern and Central Europe
Compliance	Information Technology	Run-Off Solutions	Facultative Reinsurance	Global Reinsurance: Worldwide Treaty Reinsurance, Catastrophe XL, Structured Reinsurance and Insurance-Linked Securities	Longevity Solutions	
Controlling	Investment and Collateral Management	Target Markets in Property & Casualty Reinsurance: North America, Continental Europe		Quotations		
Human Resources Management	Facility Management			Retrocessions		
Internal Auditing						
Risk Management & Actuarial						
Corporate Development						
Corporate Communications						

The four (Solvency II) key functions are allocated to the Chairman of the Executive Board. For further information on key functions (Solvency II) please refer to chapters B.3-B.6.

## Supervisory Board

The Supervisory Board shall consist of nine members appointed by the General Meeting. Of these nine members, three shall be appointed on recommendation by the employees. The General Meeting shall be bound by these recommendations for the appointment of the employees' representatives. Other than that, the General Meeting shall not be bound to proposed candidates. In the event that legal provisions concerning involvement of employees in a European Association (SE Beteiligungsgesetz – SEBG Employees Involvement Act) provide for a different appointment procedure for representatives of the employees to the Supervisory Board, the employees' representatives shall be appointed according to the agreed appointment procedure.

Every member of the Supervisory Board can resign from his membership by adhering to a notice period of one month even without an important reason by written notice to the Company, represented by the Management Board and the Chairman of the Supervisory Board (if notice is given by the Chairman himself, to his deputy). The Chairman of the Supervisory Board may choose to forgo adherence to this notice period.

Appointment for a successor of a member who has resigned prior to termination of his term shall be for the remaining period of the term of the resigned member.

As of 31 December the Supervisory Board consists of the following members:

### Members of the Supervisory Board and membership in committees

Members of the Supervisory Board	Standing Committee	Finance and Audit Committee	Nomination Committee	Staff representative
Herbert K. Haas, Chairman	X	X	X	
Torsten Leue, Deputy Chairman (since 7 May 2018)	X	X	X	
Dr. Klaus Sturany (until 7 May 2018)	X			
Wolf-Dieter Baumgartl (until 7 May 2018)	X	X	X	
Benita Bierstedt (from 1 June 2018 to 6 July 2018)				X
Frauke Heitmüller				X
Dr. Ursula Lipowski (since 7 May 2018)		X		
Otto Müller (until 31 May 2018 and since 12 July 2018)				X
Dr. Andrea Pollak			X	
Dr. Immo Querner				
Dr. Erhard Schipporeit	X			
Maike Sielaff				X

The Supervisory Board may form committees from among its members and authorise them to pass resolutions, as far as permitted by law.

The Supervisory Board considered at length during the 2018 financial year the position and development of the company and its major subsidiaries. It advised the Executive Board on the direction of the company and monitored the management of business on the basis of written and verbal reports from the Executive Board. The Supervisory Board of Hannover Rück SE held four regular meetings and two extraordinary meetings in order to adopt the necessary resolutions after appropriate discussion. In addition, the Supervisory Board adopted two resolutions in the reporting period by a written procedure. All nine Supervisory Board members took part in each of the Supervisory Board meetings held in 2018. Two representatives of the Federal Financial Supervisory Authority attended one meeting on a routine basis. In addition, the Supervisory Board was informed by the Executive Board in writing and orally on the basis of the quarterly statements about the course of business as well as the position of the company and the Group. The quarterly reports with the components of the financial statements and key figures for the Hannover Re Group constituted an important source of information for the Supervisory Board.

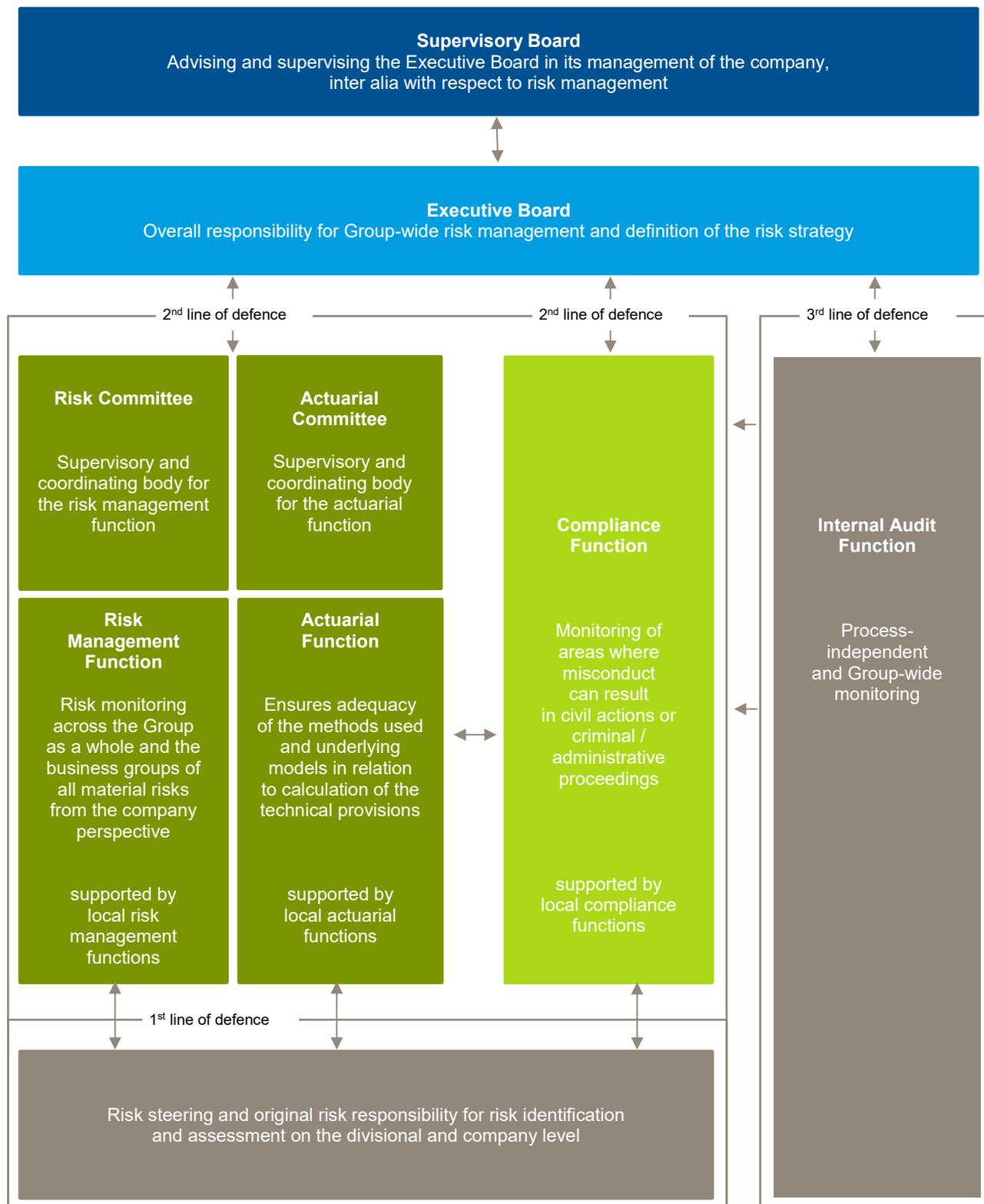
As in every year, the Supervisory Board was regularly updated on the work of the Supervisory Board committees and given a description of the major pending legal proceedings.

Of the committees formed by the Supervisory Board within the meaning of § 107 (3) German Stock Corporation Act, the Finance and Audit Committee met on four occasions, the Standing Committee met three times and the Nomination Committee met two times. The Chairman of the Supervisory Board updated the full Supervisory Board on the major deliberations of the committee meetings at its next meeting and provided an opportunity for further questions.

There were changes in the composition of the Supervisory Board, its committees and the Executive Board in the year under review. On the Supervisory Board Mr. Baumgartl and Dr. Sturany informed the Chairman of the Supervisory Board that they would be resigning their Supervisory Board mandates with effect from the end of the Annual General Meeting of Hannover Rück SE on 7 May 2018. Mr. Baumgartl also sat on the Standing Committee, the Finance and Audit Committee and the Nomination Committee. Dr. Sturany belonged to the Standing Committee. Dr. Lipowsky and Mr. Leue were elected to the Supervisory Board in the scheduled by-election held at the Annual General Meeting on 7 May 2018 with effect from the end of the Annual General Meeting. At the extraordinary Supervisory Board meeting held after the Annual General Meeting Dr. Erhard Schipporeit resigned his mandate as a member of the Finance and Audit Committee. Dr. Lipowsky and Mr. Leue were subsequently elected to the Finance and Audit Committee. Mr. Leue and Dr. Schipporeit were elected to the Standing Committee. In addition, Mr. Leue was elected to the Nomination Committee. As a member of the Supervisory Board and employee representative on the company's Supervisory Board, Mr. Otto Müller stepped down from the Supervisory Board effective 31 May 2018 at the end of his active employment relationship with the company. Ms. Benita Bierstedt succeeded Mr. Müller on the Supervisory Board as the appointed personal substitute member with effect from 1 June 2018. Ms. Bierstedt then resigned her mandate as a Supervisory Board member and employee representative on the company's Supervisory Board for personal reasons effective 6 July 2018. In the by-election that was then held for the vacant seat as an employee representative, Mr. Müller was re-elected to the Supervisory Board as an external employee representative with effect from 12 July 2018.

### B.1.1.2 Key functions

The following graph gives an overview of the main tasks and the interaction of the key functions:



Hannover Re Group has set up group-wide risk management functions and bodies to safeguard an efficient risk management system. The organisation and interplay of the individual functions in risk management are crucial to our internal risk steering and control system. The central functions of risk management are closely interlinked in our system and the roles, tasks and reporting channels are clearly defined and documented in terms of the so-called “3 lines of defence”. The first line of defence consists of risk steering and the original risk responsibility on the divisional or company level. Risk management ensures the second line of defence, i.e. the risk monitoring. It is supported in this regard by the actuarial function and the compliance function. The third line of defence is the process-independent monitoring performed by the internal audit function.

All key functions are equipped with appropriate resources and skills. The reporting lines to one another and to the Board Member responsible for the division respectively to the Executive Board have been clearly defined.

## **B.1.2 Remuneration policy**

### **B.1.2.1 Remuneration of the executive board**

The amount and structure of the remuneration of the Executive Board are geared to the size and activities of the company, its economic and financial position, its success and future prospects as well as the customariness of the remuneration, making reference to the benchmark environment (horizontal) and the remuneration structure otherwise applicable at the company (vertical). The remuneration is also guided by the tasks of the specific member of the Executive Board, his or her individual performance and the performance of the full Executive Board.

With an eye to these objectives, the remuneration system has two components: fixed salary / non-cash compensation and variable remuneration. The variable remuneration is designed to take account of both positive and negative developments. Overall, the remuneration is to be measured in such a way that it reflects the company’s sustainable development and is fair and competitive by market standards. In the event of 100% goal attainment the remuneration model provides for a split into roughly 40% fixed remuneration and roughly 60% variable remuneration.

The profit- and performance-based remuneration (variable remuneration) is contingent on certain defined results and the attainment of certain set targets. The set targets vary according to the function of the Board member in question. The variable remuneration consists of a profit bonus and a performance bonus. The variable remuneration is defined at the Supervisory Board meeting that approves the consolidated financial statement for the financial year just ended.

The total remuneration received by the Executive Board of Hannover Re Group on the basis of its work for Hannover Rück SE and the companies belonging to the Group amounts to TEUR 8,372.

### **B.1.2.2 Remuneration of the supervisory board**

The remuneration of the Supervisory Board is determined by the Annual General Meeting of Hannover Rück SE and regulated by the Statute of Hannover Rück SE.

The total remuneration received by the Supervisory Board of Hannover Rück SE amounts to TEUR 980.

### B.1.2.3 Remuneration of staff and senior executives

The remuneration scheme for senior executives below the Executive Board (management levels 2 and 3) and for key function holders in Germany belonging as a matter of principle to the ranks of senior executives consists of a fixed annual salary and a system of variable remuneration. This is comprised of a short-term variable remuneration component, the annual cash bonus, and a long-term share-based remuneration component, the Share Award Plan.

Members of staff on the levels of Chief Manager, Senior Manager and Manager are also able to participate in a variable remuneration system through the Group Performance Bonus (GPB).

### B.1.3 Related party transactions

Talanx AG holds an unchanged majority interest of 50.2% in Hannover Rück SE. For its part, HDI Haftpflichtverband der Deutschen Industrie Versicherungsverein auf Gegenseitigkeit (HDI), Hannover, holds a stake of 79.0% in Talanx AG and therefore indirectly holds 39.7% (rounded) of the voting rights in Hannover Rück SE.

The business relationship between Hannover Rück and its subsidiary E+S Rück is based on a cooperation agreement. A retrocession by Hannover Rück to E+S Rück exists in property and casualty reinsurance. The exclusive responsibilities of E+S Rück for German business and of Hannover Rück for international markets have been preserved.

Within the contractually agreed framework Ampega Asset Management GmbH (name change in January 2019, formerly: Talanx Asset Management GmbH) performs investment and asset management services for Hannover Rück SE and the vast majority of its subsidiaries. Assets in special funds are managed by Ampega Investment GmbH. Ampega Real Estate GmbH (name change in January 2019, formerly: Talanx Immobilien Management GmbH) performs services for Hannover Re under a number of management contracts.

The members of the governing bodies did not receive any advances or loans in the year under review. Nor were there any other material reportable circumstances or contractual relationships as defined by IAS 24 between companies of the Hannover Re Group and the members of the governing bodies or their related parties in the year under review.

## B.2 Fit and Proper Requirements

### B.2.1 Requirements

With a decision dated 17 November 2014, the Executive Board of Hannover Re followed the specifications stipulated by the framework directive of the HDI V.a.G. pertaining to the fulfilment of the Fit & Proper requirements, on the proviso of their continued implementation in the affected group companies and business units, and with the further condition that the framework directive is only applicable to the extent that it is relevant for Hannover Re as a reinsurance company. On 16 October 2015, the framework directive of Hannover Re pertaining to the fulfilment of the Fit & Proper requirements in the Hannover Re Group was decreed by the Executive Board.

## B.2.2 Description of requirements

The professional qualification (fitness) of individuals with key functions refers to a professional qualification suitable for the respective position as well as skills and experience, which are necessary for a robust and cautious management approach, and for the fulfilment of the position. The appropriateness is assessed according to the principle of proportionality, and takes into account the company-individual risks along with the type and scope of business operations. Specialist fitness requirements stemming from established supervisory practices are to be complied with by those individuals who actually head up the company, and the members of the Supervisory Board. Collective “fitness” requirements have been established for mutual controlling and monitoring. The requirements placed on the professional qualification of those holding key functions are closely linked with the special features of the respective governance tasks.

Individuals with key functions must, as part of personal reliability (propriety), act responsibly and with integrity, and carry out activities both dutifully and with the necessary level of care. Conflicts of interest must be avoided and the individual must not have demonstrated a lack of responsibility in the form of criminal actions prior to their nomination / appointment. There is no requirement for personal reliability to be positively established. It will be assumed, whenever there are no observable facts indicating the contrary. Unreliability is only to be assumed if personal circumstances according to general life experience give reason to believe that this could undermine the thorough and proper exercising of the function.

For Hannover Re, the circle of individuals entrusted with key tasks consists of persons who

- actually head up the company (Executive Board members) including the authorised representatives of an EU / EEA branch,
- hold other key functions (members of the Supervisory Board, owners of one of the key functions including compliance, internal audit, risk management, actuarial function).

With regard to their various roles, these individuals are required to provide evidence of their professional qualifications in different areas as follows:

- Educational background
- Practical knowledge
- Management experience
- Language skills
- Required specialist knowledge in relation to the relevant key function
- Collective requirements

The required specific knowledge for owners of one of the key functions including compliance, internal audit, risk management, and actuarial mathematics is included in the referred role description.

In the event that key functions are outsourced, general requirements for this are defined within a group policy. The onus remains on the side of the outsourcing company to ensure that the individuals deployed by the service provider who are responsible for the key function have suitable professional qualifications and are personally reliable. In accordance with supervisory regulations, the outsourcing company has to appoint an outsourcing officer for this purpose, who, where appropriate, is subject to registration with the regulatory body accordingly as the person responsible for the relevant key function within the company. The overseeing outsourcing official is

hereby responsible for the proper fulfilment of the duties associated with the outsourcing of the key function.

No key functions were outsourced in 2018.

### B.2.3 Evaluation process

The requirements and reporting processes with respect to the supervisory authority correspond to the current standard processes based on the BaFin information sheets on professional competence and reliability.

Pursuant to the framework directive on the fulfilment of the Fit & Proper requirements, at the preliminary stage of recruiting new members of staff who will actually head up the company or hold other key roles, a detailed curriculum vitae will be submitted and a requirements profile set, which detail and describe the necessary qualifications. The framework directive pertaining to the fulfilment of Fit & Proper requirements contains a checklist in the attachment, which is to be used in the assessment of the Fit & Proper requirements of these individuals. The requirements profile contains evidence of the following minimum requirements:

Description of the position with key functions:

- Performance catalogue (job description)
- Authority to make decisions
- Level of staff responsibility

Professional qualification (general):

- Level of education (commercial or vocational training)
- University degree or professional standard (such as, for example, for auditors or actuaries)
- Knowledge and understanding of business strategy
- Knowledge of the system of governance
- Foreign language skills, minimum of English language and other foreign languages where possible

Professional qualification (depending on the particular position):

- Industry experience
- Knowledge and understanding of the business model
- Ability to interpret accounting and actuarial data
- Knowledge and understanding of the regulatory frameworks affecting the company
- Expertise in personnel management, staff selection, succession planning

The professional and personal requirements for members of the Supervisory Board are comprised in a guideline document since 2017.

The procedure for assessing the transfer of tasks stipulates that, at the preliminary stage of recruiting new members of staff, a detailed curriculum vitae must be submitted and a requirements profile must be set, which contains the verification of predefined minimum requirements. The

continual safeguarding of compliance with the relevant requirements is undertaken every five years in the form of an assessment of the requirements profile, undertaken by the responsible organisational unit.

As part of the event-driven assessment, any significant changes in the underlying parameters trigger an assessment of the compliance with the catalogue of requirements. This involves a differentiation of the characteristics deemed necessary in the person and in the position.

The assessment and control procedures are summarised in an overview, which contains the assessment cycle of the requirements profile and the responsibility for the assessment and duty to inform held by those individuals who actually head up the company, and those individuals who have other key functions.

## **B.3 Risk Management System including the Own Risk and Solvency Assessment**

### **B.3.1 Strategy implementation**

Our current strategy encompasses ten guiding principles that safeguard the realisation of our vision of creating value through reinsurance across the various divisions. The following principles of the corporate strategy constitute the key strategic points of departure for our Group-wide risk management:

- We manage risks actively.
- We maintain an adequate level of capitalisation.
- We are committed to sustainability, integrity and compliance.

The risk strategy, the risk register and the central system of limits and thresholds – as integral components of our Risk and Capital Management Guideline – are reviewed at least once a year. In this way we ensure that our risk management system is kept up-to-date.

We manage our total enterprise risk such that we can expect to generate positive IFRS Group net income with a probability of 90% p.a. and the likelihood of the complete loss of our economic capital and shareholders' equity under IFRS does not exceed 0.03% p.a. Our solvency ratio is subject to a limit of 180% and a threshold of 200%. Countermeasures would be triggered if the solvency ratio was to fall below this threshold. These indicators are monitored using our internal capital model and the Executive Board is informed quarterly about adherence to these key parameters as part of regular reporting. The necessary equity resources are determined according to the requirements of our economic capital model, regulatory parameters, the expectations of rating agencies with respect to our target rating and the expectations of our clients. Above and beyond that, we maintain a capital cushion in order to be able to act on new business opportunities at any time.

### **B.3.2 Risk capital**

In the interests of our shareholders, clients and employees we strive to ensure that our risks remain commensurate with our capital resources. Our quantitative risk management provides a uniform framework for the evaluation and steering of all risks affecting the company as well as of our capital position. In this context, the internal capital model is our central tool. The internal capital model of

the Hannover Re Group is a stochastic enterprise model. It covers all subsidiaries and business groups of the Hannover Re Group. The central variable in risk and enterprise management is the economic capital, which is calculated according to market-consistent measurement principles and also constitutes the basis for calculating the own funds under Solvency II.

Hannover Re calculates the required risk capital as the Value at Risk (VaR) of the economic change in value over a period of one year with a confidence level of 99.97%. This reflects the goal of not exceeding a one-year ruin probability of 0.03%. The internal target capitalisation of the Hannover Re Group is therefore significantly higher than the confidence level of 99.5% required under Solvency II. In respect of the capitalisation under Solvency II, Hannover Re has determined a minimum solvency ratio with a limit of 180% and a threshold of 200%.

The capitalisation prescribed by regulatory requirements diverges from the capitalisation shown in accordance with the Hannover Re's internal capital model. This is due to the fact that non-controlling interests are not fully recognised according to Solvency II parameters.

Hannover Re received the approval already in 2017 by BaFin to calculate the regulatory capital requirements with a full internal model, including operational risks.

We hold additional capital to meet the requirements of the rating agencies for our target rating and to be able to act flexibly on business opportunities. We strive for a rating from the rating agencies most relevant to our industry that facilitates and secures our access to all reinsurance business worldwide. Hannover Re is analysed by the rating agencies Standard & Poor's and A.M. Best as part of an interactive rating process. The current financial strength ratings are assessed as "AA-" (Very Strong, stable outlook) by Standard & Poor's and "A+" (Superior, stable outlook) by A.M. Best. Standard & Poor's evaluates Hannover Re's risk management as "Very Strong", the best possible rating. Hannover Re's internal capital model was also subjected to expert appraisal. As a result of this review, Standard & Poor's factors the results of the Hannover Re Group's internal capital model into the determination of the target capital for the rating.

### **B.3.3 Internal model governance**

The governance of the internal model is defined in a number of documents and policies. In particular, governance rules, roles and responsibilities include standards for changes to the internal model and model validation as well as standards for internal and external data and expert settings used in the internal model. The rules have been set-up in compliance with the requirements of Solvency II.

The risk management function provides quarterly reports on internal model results and changes to the Executive Board and the Risk Committee. The reporting supports the tracking of changes to the risk profile and the solvency ratio. Apart from this reporting, internal model results are embedded in most internal steering processes such as capital cost allocation and new product evaluation.

The annual validation ensures that the internal model meets all defined quality standards of the policies. The Solvency II directive requires that the validation is performed as an independent process. Therefore, Hannover Rück has set-up a validation process which assigns validation to departments different from the departments responsible for model operation, calibration and maintenance. The validation report includes numerous stress tests and sensitivity analyses.

There have not been any significant changes in the model governance during the reporting period. However, a change to the model change policy has been filed to the regulator for approval. These

changes will take effect in 2019, in particular, the thresholds for major model changes which require regulatory approval will be lowered.

### **B.3.4 Organisation of risk management and the tasks of the risk management function**

For the fundamental organisational structure please refer to Section B.1.

The risk management function consists of three primary components: the Risk Committee, the Chief Risk Officer and the risk monitoring function.

#### **Risk Committee**

The tasks of the Risk Committee – the body charged with the monitoring and coordination of risk management – are derived from the rules of procedure regarding the Risk Committee. The scope of decision-making for the Risk Committee lies within the boundaries of risk appetite set by the Executive Board. Changes, and any instances of increase in risk appetite, require the approval of the Executive Board. Further tasks include quality assurance of the ORSA process and monitoring of the implementation of risk-related measures. The Risk Committee also receives the model change reports according to the model change policy.

#### **Chief Risk Officer**

The Chief Risk Officer is also the head of the risk monitoring function and member of the Risk Committee. The Chief Risk Officer coordinates the ORSA process and ensures the framework conditions of an effective risk management system.

#### **Risk monitoring function**

The risk monitoring function coordinates and bears responsibility for comprehensive monitoring (systematic identification, evaluation, monitoring and reporting) of all significant asset- and liability-related risks and the regular execution of the ORSA process. Furthermore, the risk monitoring function develops methods, standards and processes for the assessment and monitoring of risk.

The risk monitoring function fulfils its tasks objectively and independently for Hannover Re. There have been no material changes in the risk management system during the reporting period.

### **B.3.5 Key elements of our risk management system**

Our risk strategy and our Risk and Capital Management Guideline including the system of limits and thresholds for material risks of the Hannover Re Group describe the central elements of our risk management system. This is subject to a constant cycle of planning, action, control and improvement. Systematic risk identification, analysis, measurement, steering and monitoring as well as risk reporting are especially crucial to the effectiveness of the system as a whole.

This guideline describes, among other things, the major tasks, rights and responsibilities, the framework conditions and the risk control process. The rules, which are derived from the corporate strategy and the risk strategy, additionally take account of the regulatory requirements for risk management as well as international standards and developments relating to appropriate enterprise management. Group-wide risk communication and an open risk culture are important to our risk management. Regular global meetings attended by the actuarial units and risk management functions serve as a major anchor point for strategic considerations in relation to risk

communication. Beyond that, the requirements by the risk management are stated in guidelines and policies, which are communicated Group-wide.

### Risk-bearing capacity concept

The establishment of the risk-bearing capacity involves determining the total available risk coverage potential and calculating how much of this is to be used for covering all material risks. This is done in conformity with the parameters of the risk strategy and the risk appetite defined by the Executive Board. The quantitatively measurable individual risks and the risk position as a whole are evaluated using our risk model. A central system of limits and thresholds is in place to monitor material risks. This system incorporates – along with other risk-related key figures – in particular the indicators derived and calculated from the risk-bearing capacity. Adherence to the overall risk appetite is verified on an ongoing basis.

### Risk identification

A key source of information for monitoring risks is the risk identification carried out on a periodic basis. All identified risks are documented in a central register containing all material risks. Risk identification takes the form of, among other things, structured assessments, interviews or scenario analyses. External insights such as recognised industry know-how from relevant bodies or working groups are incorporated into the process. Risk identification is important for ensuring that our risk management consistently remains up-to-date.

### Risk analysis and assessment

In principle, every risk that is identified and considered material is assessed quantitatively. Only risk types for which quantitative risk measurement is currently impossible or difficult are assessed qualitatively (e.g. strategic, reputational or emerging risks). Qualitative assessment can take the form of, for example, expert evaluations. Quantitative assessment of material risks and the overall risk position is performed using the Hannover Re risk model. The model makes allowance for risk concentration and risk diversification.

### Risk steering

The steering of all material risks is the task of the operational business units on the divisional and company level. In this context, the identified and analysed risks are either consciously accepted, avoided or minimised. The risk / reward ratio is factored into the division's decision. Risk steering is assisted by the parameters of the central and local underwriting guidelines and by defined limits and thresholds.

### Risk monitoring

The monitoring of all identified material risks is a core task of Group Risk Management. This includes, inter alia, monitoring execution of the risk strategy as well as adherence to the defined limits and thresholds and to risk-related methods and processes. A further major task of risk monitoring is the ascertainment of whether risk steering measures were carried out and whether the planned effect of the measures is sufficient.

### Risk communication and risk culture

Risk management is firmly integrated into our operational processes. It is assisted by transparent risk communication and the open handling of risks as part of our risk culture. Risk communication takes the form, for example, of internal and external risk reports, information on current risk complexes in the intranet and training opportunities for staff. The regular sharing of information

between risk-steering and risk-monitoring units is also fundamental to the proper functioning of risk management.

### Risk reporting

Our risk reporting provides systematic and timely information about all material risks and their potential implications. The central risk reporting system consists primarily of regular risk reports, e.g. on the overall risk situation, adherence to the parameters defined in the risk strategy or on the capacity utilization of natural catastrophe scenarios. Complementary to the regular risk reporting, immediate internal reporting on material risks that emerge at short notice takes place as necessary.

### Process-integrated / -independent monitoring and quality assurance

Irrespective of internally assigned competencies, the Executive Board is responsible for the orderly organisation of the company's business. This also encompasses monitoring of the internal risk steering and control system. Furthermore, the Executive Board is the owner of the economic capital model and is responsible for the approval of major model changes. Process-independent monitoring and quality assurance of risk management is carried out by the internal audit function and external instances (regulators, independent auditors and rating agencies). Most notably, the independent auditors review the trigger mechanism and the internal monitoring system. The entire system is rounded off with process-integrated procedures and rules, such as those of the internal control system.

### B.3.6 Risk landscape

In the context of its business operations the Hannover Re Group enters into a broad variety of risks. These risks are deliberately accepted, steered and monitored in order to be able to act on the associated opportunities. The parameters and decisions of the Executive Board with respect to the risk appetite of the Hannover Re Group, which are based on the calculations of risk-bearing capacity, are fundamental to the acceptance of risks. Through our business operations on all continents and the diversification between our Property & Casualty and Life & Health reinsurance business groups we are able to effectively allocate our capital in light of opportunity and risk considerations and generate a higher-than-average return on equity. Along with our principal business operations as a reinsurer of property & casualty and life & health business, we also transact primary insurance in selected niche markets as a complement to our core reinsurance business. With this approach we are well positioned for further profitable growth. In this context crucial importance attaches to our risk management in order to ensure that, among other things, risks to the reinsurance portfolio remain calculable and also exceptional major losses do not have an unduly adverse impact on the result.

The risk landscape of Hannover Re encompasses:

- underwriting risks in property & casualty and life & health reinsurance which originate from our business activities and manifest themselves inter alia in fluctuations in loss estimates as well as in unexpected catastrophes and changes in biometric factors such as mortality,
- market risks which arise in connection with our investments and also as a consequence of the valuation of sometimes long-term payment obligations associated with the technical account,
- counterparty default risks resulting from our diverse business relationships and payment obligations inter alia with clients, retrocessionaires and banks,

- operational risks which may derive, for example, from deficient processes or systems as well as
- reputational, liquidity, strategic and emerging risks.

At the present time our most significant single risks are the credit and spread risks within the market risks, the reserving and catastrophe risks within the underwriting risks of property and casualty reinsurance and the risk of changes in mortality within the underwriting risks of life and health reinsurance. With regard to mortality risks, as a general principle annuity portfolios are impacted by improvements in mortality while death benefit portfolios are adversely affected by deteriorations in mortality. The specific risk characteristics and the principal monitoring and steering mechanisms are described in the following sections.

### **B.3.7 Own Risk and Solvency Assessment (ORSA)**

The ORSA report, which is generated annually in the first half of the year after the completion of the financial year in question, primarily consists of an analysis of current and future risks, which could threaten the continued existence of Hannover Re. Here, the internal model is used – especially for the calculation of solvency requirements in comparison to the allocated risk capital – and its results are displayed. Capital resources are presented, stress tests are executed and a risk and profit forecast is generated – including scenario analysis. The interplay between risk and capital management is highlighted here. Finally, it explains the inclusion of the Executive Board into the ORSA process and its use as one of the controlling instruments at the company's disposal.

The ORSA report is coordinated by the risk management division and is subject to both assessment and approval by the Executive Board. In addition, the report is submitted to the Supervisory Board and the BaFin.

The ORSA cycle mirrors our circuit of planning, action, monitoring und finally enhancement and comprises the elements listed in section B.3.5.

#### **Risk reporting**

We produce regular reports which demonstrate the company's risk position. To be mentioned are for example the internal and external risk reports, internal model result reports including solvency calculation, actuarial report and the report on mid-term outlook.

All these reports are the basis for the solvency and risk assessments described in the ORSA report. Therein all employees contributing to the above procedures are involved as data and information suppliers and consulted for quality assurance.

The Executive Board observes the ORSA results for a full accomplishment of defined business targets, changes in the business process take place, if needed. This establishes a surveillance circuit for business enhancements and risk mitigation.

Furthermore, thereby the overall administrative, management or supervisory body (AMSB) can report to BaFin in detail using the ORSA report.

In the event of a necessary ad hoc ORSA, potentially because of a material change in risk profile, Hannover Re has defined specific procedural plans and responsibilities.

## B.4 Internal Control System

### B.4.1 Elements of the Internal Control System

We organise our business activities in such a way that they are always in conformity with all legal requirements. The internal control system (ICS) is an important subsystem that serves, among other things, to secure and protect existing assets, prevent and reveal errors and irregularities and comply with laws and regulations. The core elements of Hannover Re's ICS are documented in a guideline that establishes a common understanding of the differentiated execution of the necessary controls. In the final analysis, it is designed to systematically steer and monitor the implementation of our corporate strategy.

The guideline defines concepts, stipulates responsibilities and provides a guide for the description of controls. In addition, it forms the basis for the accomplishment of internal objectives and the fulfilment of external requirements imposed on Hannover Re. The ICS consists of systematically structured organisational and technical measures and controls within the enterprise. This includes, among other things, the principle of dual control, separation of functions, documentation of the controls within processes and technical plausibility checks and access privileges in the IT systems.

The proper functioning of the ICS necessitates the involvement of management, executive staff and employees on all levels. The financial reporting of the parent company and the Group must satisfy international and national financial reporting standards as well as regulatory requirements. This is safeguarded in the area of accounting and financial reporting by processes with integrated controls which ensure the completeness and accuracy of the annual and consolidated financial statements. A structure made up of differentiated criteria, control points and materiality thresholds assures our ability to identify and minimise the risk of material errors in the annual and consolidated financial statements at an early stage.

### B.4.2 Compliance function

#### Implementation of the Compliance function

Hannover Re has opted for a decentralised approach towards the implementation of the compliance function, i.e. the tasks of the compliance function will not only be fulfilled by one department, but by various departments. The compliance function is therefore located in several departments.

The head of the Hannover Re's department Group Legal Services (GLS) is the holder of the key compliance function at the same time.

The Executive Board of Hannover Re has established the compliance division within GLS for the fulfilment of some of the tasks of the compliance function. The Compliance Officer is authorised to task further members of staff from GLS for the purpose of fulfilling compliance functions as necessary.

Hannover Re has specified its compliance policy in writing in a manual bearing the title "Corporate Compliance of Hannover Re and E+S Rück – Organisation, functions and responsibilities". This manual is regularly assessed for its topicality and, if necessary, updated – at least once a year – and on an event-driven basis by the members of staff within the compliance function when new developments occur.

There were no significant changes to the compliance policy during the reporting period.

Hannover Re has deemed the following topics to be of particular relevance for compliance, and has determined these to be key areas of compliance:

- Fulfilment of statutory requirements
- Compliance with foreign trade legislation and sanction provisions
- Compliance with company law (including the German Corporate Governance Code)
- Compliance with capital market legal provisions (in particular with obligations pursuant to the Market Abuse Directive [Marktmissbrauchsverordnung], the German Securities Trading Act [WpHG] and the German Securities Acquisition and Takeover Act [WpÜG]), laws relating to insider-trading, director dealings and ad hoc reporting
- Compliance with antitrust and competition provisions
- Compliance with the code of conduct
- Combating corruption / embezzlement / fraud
- Compliance with data protection norms
- Compliance with the regulations stipulated by employment law
- Compliance with tax laws
- Execution of orderly financial reporting

The fulfilment of all statutory reporting requirements is ensured by assigning them to the responsible organisational units.

### Tasks

The compliance function ensures compliance with the relevant external provisions by Hannover Re.

These key areas of compliance as mentioned above are monitored by the compliance function at Hannover Re. Therefore, different departments work together in order to fulfil this function. E.g. employment law remains the responsibility of the Human Resources department, tax law falls under the jurisdiction of the Tax department of Hannover Re.

The handling of particularly compliance-relevant topics by the departments, who collectively form the compliance function, comprises at the least the following activities:

- Identification and evaluation of risks, which are associated with the non-compliance of statutory requirements (risk control)
- Evaluation of the possible consequences for the company's activity as a result of changes in legal operating conditions (risk relating to changes in the law / early warning)
- Consultation with regard to compliance with the legal provisions which apply to company activity
- Assessment of the appropriateness of implemented measures in relation to compliance with statutory requirements (monitoring function)

The compliance function has a regular risk review (at least once a year) carried out by the other departments dealing with particularly compliance-relevant issues, outlining which non-compliance risks have been identified and what measures are being deployed in these departments to minimise these risks. This ensures that all issues being handled within the compliance function are monitored and dealt with.

The appointed Compliance Officer for Hannover Re bears particular responsibility for the following tasks:

The Compliance Officer monitors changes made to legal provisions and standards made by legislators, as well as case law. He assesses the new developments for their relevance and communicates pertinent innovations and changes to the respective departments and the Executive Board. The compliance function also holds regular training sessions for members of staff, in particular with regard to legislative reforms, announcements by the insurance supervisory authority or other changes.

By way of continuous monitoring, the Compliance Officer and the members of staff of the compliance function contribute to ensuring compliance by the executive bodies (Executive Board and Supervisory Board) and the members of staff of Hannover Re with legal and regulatory operating conditions.

The Compliance Officer advises members of the Executive Board and members of staff of Hannover Re upon request regarding compliance topics.

Every year, the Compliance Officer generates a compliance plan for the following year. The Compliance Officer also created a compliance plan together with the members of staff of the compliance function for the year 2018. This plan determines where the key areas of compliance activity should be in the subsequent year.

The Compliance Officer and the members of staff of the compliance function assess compliance reports submitted by the company branches, and generate the Hannover Re compliance report for the previous calendar year until the balance committee meeting of the Supervisory Board. The report contains information on compliance-relevant topics such as, for example, specific details regarding significant breaches of compliance which have surfaced, as well as proposed and implemented measures relating to their elimination, current assessments pertaining to compliance risks, proposed measures aimed at limiting compliance risks etc.

### Reporting lines

As the holder of the compliance function, the Compliance Officer reports directly to the members of the Executive Board responsible for GLS and the compliance function within Hannover Re.

Reports are provided on relevant compliance incidents and are completed in written, verbal or electronic form, although verbal reports are, as a rule, subsequently backed up in writing.

Depending on the seriousness of the incident, the reporting can be performed within a regular annual report or on an ad hoc basis.

## B.5 Internal Audit Function

### Implementation of the Internal Audit Function

The company's internal audit function is executed by the department of Group Auditing (GA). GA renders independent, objective auditing services including evaluations and recommendations, which play a key role in safeguarding the external and internal compliance of processes, the internal control system and other areas of the company, as well as identifying potential areas for improvement and thus generating added value. In addition to its auditing role, GA operates as an internal advisor generating valuable input as part of network collaboration with other units and functions within the company.

The Executive Board ensures that GA is not subject to instruction regarding audit planning, audit execution, reporting and the assessment of audit results. For the purposes of safeguarding independence, the Head of GA, who is simultaneously the key function holder for the company's internal audit function pursuant to Sections 30 and 47 (1) of the Insurance Supervision Act (VAG), reports directly to the Chairman of the Executive Board in all professional and disciplinary matters. Members of the internal audit staff are exclusively employed in GA and only execute tasks which are in line with the GA internal audit policy. This policy was released by the Executive Board and specifies the authorities of the internal audit function.

The GA team unites people of different educational backgrounds as well as different university and vocational degrees in order to cover the wide range of audit tasks. The employees hold a comprehensive professional experience, gained internally (especially from underwriting) as well as externally (in particular from external auditing and consulting). If a specific need for additional resources or skills arises, GA can involve internal peers or external capacities.

### Tasks

GA supports the Executive Board in the attainment of company targets by assessing all business areas, processes and systems within the company in a targeted, independent and objective way, through the use of a systematic, risk-oriented approach as part of audit planning and execution, while also contributing to the company's further development. Auditing results are reported directly to the Executive Board. The assessment of individual findings and the overall assessment of the audit results is undertaken exclusively by GA. The underlying classification scheme defined by GA ensures an objectification of the estimations made.

### Reporting lines

The internal audit function reports its auditing results and recommendations to the Executive Board continuously in the form of written audit reports, and / or immediately in the event of serious deficiencies, as well as once a year in the form of the GA annual report. The implementation of agreed recommendations and measures in the audits is monitored by GA up until the determined deadlines.

## B.6 Actuarial Function

### Implementation of the Actuarial Function

Tasks and responsibilities of the Actuarial Function (AF) are defined in the AF policy which has been approved by the Executive Board. The owner of the AF coordinates the tasks of the AF.

The AF is organised in a decentralised way. Main tasks are fulfilled by departments of the central division Group Risk Management. This reflects the common understanding between the two key functions of AF and the Risk Management Function (RMF) that a broad exchange of information and a competent support of each other's function is useful to fulfil their individual tasks in an effective and efficient way.

With respect to an opinion on the underwriting policy, the AF is supported by those departments assigned to the risk management, which are concerned with premium risk and with the measurement of underwriting risk, respectively. For the evaluation of the retrocession and the accompanying risks, there is a close collaboration between respective departments within the risk management. In addition those departments which coordinate the retrocession program of the company are involved.

## Tasks

The tasks of the AF are inter alia:

- Coordination and validation of the calculation of the Solvency II technical provisions (TP)
- Ensure the appropriateness of the applied methods, the underlying models and assumptions
  - used for the calculation of the TP for solvency as well as for accounting purposes
  - used as a basis for the appropriate recognition of the inherent risks of these methods, models and assumptions in the internal model
- Evaluation of the uncertainty associated with the estimations made in the calculation of the TP
- Regular review and assessment of the underlying data in terms of sufficiency and quality
- Regular comparison of best estimates against experience
- Reconciliation of TP between local accounting principles and Solvency II
- External validation and quality checks by actuarial consulting companies in addition to the internal validation of the TP
- Recommendations on improving processes and models used for the calculation of the TP, including data collection, if deficiencies have been observed, and monitoring of their implementation
- In the context of the contribution to the RMF inter alia
  - Support of the internal model, especially with respect to underwriting risks (delivery / validation of models, data, parameters)
  - Monitoring of the reserve level within the scope of the system of limits and thresholds
  - Analysis of large transactions and new types of business
- Preparation of the AF report containing inter alia the following topics
  - Tasks of the AF
  - Activities of the AF in the reporting period
  - Methods, results and sensitivity analyses in respect of TP
  - Opinion on the underwriting policy, and
  - Opinion on the retrocession policy

## Reporting Lines

In addition to the annual AF report, the responsible owner of the AF reports regularly directly to the Executive Board and to the Actuarial Committee, which is the responsible committee for the information exchange with the AF. If necessary, the AF reports to the Board or the Actuarial Committee on an ad hoc basis or upon requests and vice versa any requests of these two bodies were directed to the responsible owner of the AF. These direct reporting lines ensure the independence of the AF from the other key functions and the operational management.

The Actuarial Committee consists of the CEO, CFO, and the Board member who is responsible for the coordination of Property and Casualty reinsurance, the head of the AF and the head of the AF for Life & Health reinsurance business.

## B.7 Outsourcing

Hannover Re has an outsourcing policy in place which is approved by the Executive Board. The outsourcing policy describes all statutory, regulatory and internal requirements imposed on the

outsourcing of (re-)insurance activities and functions. Here, the entire outsourcing management process is described, which consists of the following five process steps:

- Planning and classification
- Risk analysis and due diligence
- Contract management and notification
- Steering and monitoring
- Renewal and termination

All relevant stakeholder groups are involved in the outsourcing management process. Intra-Group outsourcings are also integrated into the outsourcing management process.

Among others, Hannover Re has currently outsourced the asset and investment management, this on an intra-Group basis to Ampega Asset Management GmbH (name change in January 2019, before: Talanx Asset Management GmbH), located in Cologne (Germany). This matter concerns the only so-called important outsourcing of the Group.

## **B.8 Any other information**

### **Evaluating the appropriateness of the system of governance**

On an annual basis, the Executive Board receives an opinion from the System of Governance Assessment Committee regarding the past financial year. This opinion presented by the committee dated 11 March 2019 was assessed and approved by the Executive Board.

The committee is made up of the Heads of key functions, the Head of Corporate Development and the Head of Human Resources, and convenes at least once a year. Guests are invited on an event-driven basis. The basis for the assessment of the system of governance includes, among other things, the annual reports submitted by the key functions.

Based on the assessment conducted by the committee, the Executive Board has reached the conclusion that the system of governance of Hannover Re is appropriate considering the scope and complexity of its business activities and the inherent risks.

## C. Risk Profile

In the context of its business operations the Hannover Re Group enters into a broad variety of risks. These risks are deliberately accepted, steered and monitored in order to be able to act on the associated opportunities. The parameters and decisions of the Executive Board with respect to the risk appetite of the Hannover Re Group, which are based on the calculations of risk-bearing capacity, are fundamental to the acceptance of risks. Through our business operations on all continents and the diversification between our Property & Casualty and Life & Health reinsurance business groups we are able to effectively allocate our capital in light of opportunity and risk considerations. Along with our principal business operations as a reinsurer of property & casualty and life & health business, we also transact primary insurance in selected niche markets as a complement to our core reinsurance business. With this approach we are well positioned for further profitable growth. In this context crucial importance attaches to our risk management in order to ensure that, among other things, risks to the reinsurance portfolio remain calculable and also exceptional major losses do not have an unduly adverse impact on the result and the capital position.

The risk landscape of Hannover Re encompasses:

- underwriting risks in property & casualty and life & health reinsurance which originate from our business activities and manifest themselves inter alia in fluctuations in loss estimates as well as in unexpected catastrophes and changes in biometric factors such as mortality,
- market risks which arise in connection with our investments and also as a consequence of the valuation of sometimes long-term payment obligations associated with the technical account,
- counterparty default risks resulting from our diverse business relationships and payment obligations inter alia with clients, retrocessionaires and banks,
- operational risks which may derive, for example, from deficient processes or systems and
- other risks, such as reputational and strategic risks.

At the present time our most significant risks are the default and spread risks within the market risks, the reserving and catastrophe risks within the underwriting risks of property and casualty reinsurance and the risk of changes in mortality within the underwriting risks of life and health reinsurance. The general annuity portfolios are adversely impacted by improvements in mortality while death benefit portfolios are adversely affected by deteriorations in mortality.

Retrocession has a particular significance within risk appetite and risk reduction. Business which does not remain in deductibles is retroceded to third parties in order to protect the capital of the Hannover Re Group. The process of strategic retrocession placement for the Group, subsidiaries or branches is determined by the respective Board member and overseen by the Executive Board.

In the course of the mid-term planning we monitor the business development over a time horizon of five years. Besides the basic scenario we also behold alternative scenarios in respect of macro-economic developments and evolution of (re)insurance markets. Under the assumptions within the mid-term business plan, the risk profile and the capitalisation of Hannover Re Group remains comfortable.

Large transactions are assessed in regards of the influence on the risk profile, the capitalisation and the defined limits for different risk categories. Therewith we secure that the risks develop in line with our risk appetite.

New reinsurance and investment products are analysed under a dedicated process, namely the New Products Process (NPP). In addition to analysing the risk profile, integration into all internal processes, such as accounting and risk monitoring, is also defined. In 2018, two NPPs were completed and the products were approved by the Board.

## C.1 Underwriting risk

### C.1.1 Underwriting risk Property and Casualty

Risk management in property and casualty reinsurance has defined various overall guidelines for efficient risk steering. These include the use of retrocessions to reduce volatility and protect capital. It is also crucial to steer the acceptance of risks systematically through the existing central and local underwriting guidelines. Our conservative reserving level is a key factor in our risk management. We make a distinction between risks that result from business operations of past years (reserve risk) and those stemming from activities in the current or future years (price / premium risk). In the latter case, special importance attaches to the catastrophe risk.

The risk capital with a confidence level of 99.5% for underwriting risks in property and casualty reinsurance breaks down as follows:

#### Solvency Capital Requirement for underwriting risks in property and casualty reinsurance

in TEUR	2018	2017
Premium risk (incl. catastrophe risk)	2,862,335	2,472,013
Reserve risk	2,275,664	2,253,826
Diversification	-1,318,745	-1,240,390
<b>Underwriting risk property and casualty</b>	<b>3,819,254</b>	<b>3,485,449</b>

The capital requirement for underwriting risks in property and casualty reinsurance increased primarily as a consequence of higher underwriting capacities for natural perils and model adjustments made to specific large loss models.

Diversification within the Property & Casualty reinsurance business group is actively managed through allocation of the cost of capital according to the contribution made to diversification. A high diversification effect arises out of the underwriting of business in different lines and different regions with different business partners. In addition, the active limitation of individual risks – such as natural catastrophes – enhances the diversification effect.

#### C.1.1.1 Risks arising from natural disasters

The largest share of the required risk capital for the premium risk is attributable to risks from natural disasters. They constitute the main concentration risk in property and casualty reinsurance. The following table shows the required risk capital for four of our largest natural hazards scenarios:

**Solvency Capital Requirement for four of our largest natural hazards scenarios**

in TEUR	2018	2017
Hurricane US	1,774,513	1,605,569
Earthquake US West Coast	1,437,560	1,071,202
Earthquake Japan	707,438	613,908
Winter storm Europe	609,774	665,146

The higher capital requirements for Hurricane US, Earthquake US West Coast and Earthquake Japan compared to last year are primarily due to new and expansion of established business. The decrease of the capital requirement for Europe Winter storm is mainly caused by an update of the vendor model for Europe Winter storm.

For the purpose of assessing our catastrophe risks from natural hazards, especially earthquake, windstorm and flood, we use licensed scientific simulation models, supplemented by the expertise of our own specialist departments. The models deliver probability distributions for losses from natural catastrophes. The monitoring of the risks resulting from natural hazards is complemented by scenario analyses.

**Stress tests for natural catastrophes after retrocessions**

Effect on forecast net income

in TEUR	2018	2017
<b>Winter storm Europe</b>		
100-year loss	-312,003	-378,188
250-year loss	-525,998	-542,502
<b>Hurricane US</b>		
100-year loss	-1,033,223	-921,034
250-year loss	-1,471,642	-1,274,814
<b>Typhoon Japan</b>		
100-year loss	-216,385	-183,095
250-year loss	-294,045	-256,601
<b>Earthquake Japan</b>		
100-year loss	-344,345	-282,208
250-year loss	-664,342	-521,994
<b>Earthquake US West Coast</b>		
100-year loss	-634,768	-420,173
250-year loss	-1,194,699	-921,658
<b>Earthquake Australia</b>		
100-year loss	-191,942	-154,362
250-year loss	-499,845	-445,318

The Executive Board defines the risk appetite for natural perils once a year on the basis of the risk strategy by specifying the portion of the economic equity that is available to cover risks from natural perils. This is a key basis for our underwriting approach in this segment. As part of our holistic approach to risk management across business groups, we take into account numerous relevant scenarios and extreme scenarios, determine their effect on portfolio, evaluate them in relation to the planned figures and identify alternative courses of action.

For the purposes of risk limitation, maximum amounts are also stipulated for various extreme loss scenarios and return periods in light of profitability criteria. Risk management ensures adherence to

these maximum amounts. The Executive Board and Risk Committee are kept regularly updated on the degree of capacity utilisation. The limits and thresholds for the 200-year annual aggregate loss as well as the utilisation thereof are set out in the following table:

**Limit and threshold for the 200-year aggregate annual loss as well as utilisation thereof**

Loss relative to the underwriting result

in TEUR	Limit 2018	Threshold 2018	Actual utilisation (July 2018)
All natural catastrophe risks			
200-year aggregate annual loss	1,873,430	1,686,087	1,445,737

### C.1.2 Reserve risk

The reserve risk, i.e. the risk of under-reserving and the resulting strain on the underwriting result, is a high priority in our risk management. We attach importance to maintaining a conservative reserving level. In order to counter the risk of under-reserving we calculate our loss reserves based on our own actuarial estimations and establish, where necessary, additional reserves supplementary to those posted by our cedants as well as the segment reserve for losses that have already occurred but have not yet been reported to us. Liability claims have a major influence on the segment reserve. The segment reserve is calculated on a differentiated basis according to lines of business and regions.

The statistical run-off triangles are another monitoring tool used by our company. They show changes in the reserve over time as a consequence of paid claims and changes in the recalculation of the reserves at each reporting date. Their adequacy is monitored using actuarial methods.

Our own actuarial calculations regarding the adequacy of the reserves are also subject to annual quality assurance reviews conducted by external firms of actuaries and auditors.

In order to partially hedge inflation risks Hannover Re holds securities in its portfolio with inflation-linked coupons and redemption amounts. An inflation risk exists particularly inasmuch as the liabilities (e.g. loss reserves) could develop differently than assumed at the time when the reserve was constituted because of inflation. The specified bonds protect these parts of the loss reserves against inflation risks.

### C.1.3 Risk mitigation techniques Property & Casualty

#### C.1.3.1 Strategic aims and key figures

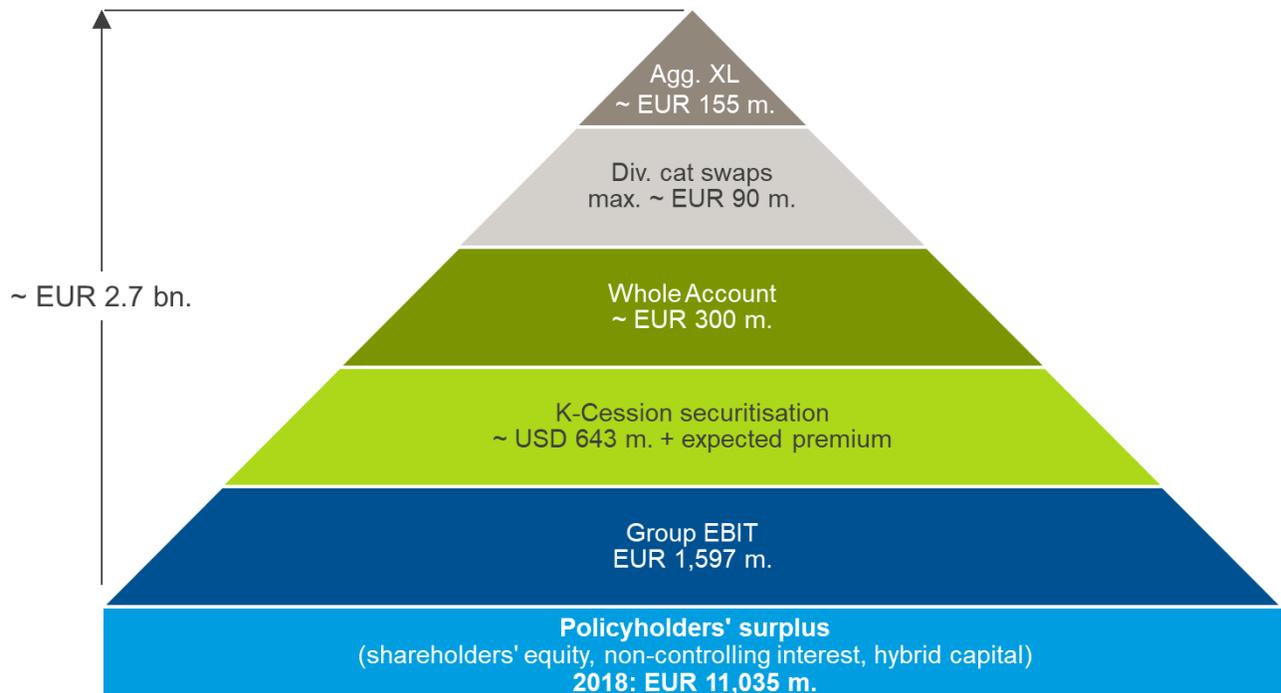
The strategic aims in relation to the placement of retrocessions are determined by the placing unit and the relevant member of the Executive Board. The Executive Board oversees the placement of the retrocessions as a whole, in particular the limits, premiums and contractual terms.

The Executive Board derives the risk budget for natural perils from the global risk budget. Many risk tolerances are based on net metrics, i.e. the placement of retrocessions plays a key role in adhering to the limits.

Capacities are derived from the global and local risk tolerances on a per scenario and market sector basis. The capacity matrix forms the operational management tool and ensures a consistent top-down approach.

During the planning phase in September and October every year, the Executive Board decides on the capacities for the following year. The planning process includes an assessment of the utilisation of all risk tolerances. An overutilization would be inconsistent with the risk appetite and an underutilisation would result in under-deployment of allocated capital.

The resulting multilevel protection increases the reinsurance capacity for natural catastrophes and thus provides additional revenues with a defined risk appetite.



As at March 2019

The main retrocessions are described below.

### C.1.3.2 Description of main types of cover against natural perils

Details on the individual forms of reinsurance covers are described below.

#### Whole Account Protection 2018

The Whole Account Protections cover all property, motor hull and engineering business of the Hannover Re Group, i.e. business recorded in Hannover and through subsidiaries or branch offices. The protections are placed on a gross claim basis.

#### Large Loss Aggregate XL 2018

The Large Loss Aggregate XL is an aggregate protection and covers the whole Property & Casualty book of the Hannover Re Group.

## K-quota share 2018

The portfolio covered under the K-quota share consists of the following segments and regions of the Cat XL business of the Hannover Re Group:

- Natural perils in Australia, Japan, Canada and USA (mainly wind and earthquakes)
- Natural perils in northern Europe (mainly wind, earthquakes, hail and floods)
- Natural perils in New Zealand (mainly earthquakes)
- Aviation (all XL contracts) and Marine & Energy (all XL contracts)

By way of its “K-transactions”, Hannover Re has raised underwriting capacity for catastrophe risks on the capital market. The “K-Cession”, which was placed with investors in North and South America, Europe and Asia, involves a quota share cession on worldwide natural catastrophe business as well as aviation and marine risks. A large part of the total volume of the K-Cession was securitised via structured entities. The transaction has an indefinite term and can be cancelled annually by the investors. Segregated accounts of Kaith Re Ltd. are used for transformer purposes for part of this transaction. Hannover Re also uses further segregated accounts of Kaith Re Ltd. and other structured entities outside the Group for various retrocessions of both its traditional and ILS covers, which in each case are passed on to institutional investors in securitised form. The structured entities are in most cases fully funded by contractually defined investments in the form of cash and equivalent liquid assets.

## E+S Cat XL protection

In addition to the Hannover Re retrocessions, there is a specific cover for E+S Rück. The so-called E+S Cat XL covers all natural perils: wind, hail, flood and earthquake. The covered area is worldwide.

### C.1.4 Underwriting risk Life and Health

All risks directly connected with the life of an insured person are referred to as biometric risks. They include in particular the miscalculation of mortality, life expectancy, morbidity and occupational disability. Biometric risks are the material risks for our company in the area of life and health reinsurance. Our goal is to strike a balance between biometric risks. Furthermore, we are exposed to lapse risks because the cash flows resulting from our reinsurance treaties are in part dependent on lapse rates among policyholders. Counterparty default risks are also material since we partly prefinance our cedants’ new business acquisition costs. Furthermore, we are exposed to catastrophe risks, especially events involving a high number of fatalities in our insurance portfolio.

The reserves are determined on the basis of secure biometric actuarial bases in light of the information provided by our clients. The biometric actuarial bases used and the lapse assumptions are continuously reviewed with an eye to their adequacy and if necessary adjusted. This is done using the company’s own empirical data as well as market-specific insights. Our current risk profile in life and health reinsurance is dominated by mortality and longevity risks. This is due to the fact that under some of our contracts we pay death benefits, while under others we pay survival benefits. The volume of our annuity portfolio contributes to diversification within life and health reinsurance. We calculate the diversification effect between mortality and longevity risks prudently in view of the fact that the contracts are normally taken out for different regions, age groups and individuals. The required risk capital with a confidence level of 99.5% for underwriting risks in life and health reinsurance breaks down as follows:

**Required risk capital for underwriting risks life and health reinsurance**

Required risk capital at a confidence level of 99.5%

in TEUR	2018	2017
Mortality risk	1,668,272	1,921,991
Longevity risk	1,176,580	1,531,409
Morbidity and disability risk	881,065	632,404
Lapse risk	426,631	422,697
Expense risk	206,530	217,057
Diversification	-2,146,605	-2,370,900
<b>Underwriting risk life and health</b>	<b>2,212,474</b>	<b>2,354,658</b>

Diversification is a central management tool for our company. We seek to spread risks as far as possible across different risk classes and different regions. In our pricing of reinsurance treaties we provide incentives to further increase diversification.

The underwriting risks in life and health reinsurance decreased due to a reduced exposure to longevity and mortality risks. This contrasts with a higher exposure to morbidity risks resulting from expansion of the business.

A risk concentration in Life and Health reinsurance business is primarily present due to mortality risks. In addition, the risk of a pandemic event governs an essential fraction of our solvency capital requirement for life and health business with regard to concentration risks. To govern our risks we regularly monitor our exposure regarding potential pandemic events in the context of internal model runs. More detailed information is also available in Section D.2.2.2.

Through our quality assurance measures we ensure that the reserves established by ceding companies in accordance with local accounting principles satisfy all requirements with respect to the calculation methods used and assumptions made (e.g. use of mortality and morbidity tables, assumptions regarding the lapse rate). In addition, the assumptions are continuously reviewed on the basis of empirical data and modified if necessary. New business is written in all regions in compliance with underwriting guidelines applicable worldwide, which set out detailed rules governing the type, quality, level and origin of risks and how these considerations are factored into the pricing. These global guidelines are revised annually and approved by the Executive Board. Special underwriting guidelines give due consideration to the particular features of individual markets. By monitoring compliance with these underwriting guidelines we minimise the risk of an inability to pay or of deterioration in the financial status of cedants. Regular reviews and holistic analyses (e.g. with an eye to lapse risks) are carried out with respect to new business activities and the assumption of international portfolios. Large transactions are also examined by our risk management department. Individual actuarial reports and documentation ensure that regular scrutiny also takes place on the level of the subsidiaries. The interest rate risk, which in the primary sector is important in life business owing to the guarantees that are given, is of only minimal relevance to our company thanks to the design of our reinsurance treaties. We have confidence in the entrepreneurial abilities of our underwriters and grant them the most extensive possible powers. In our decentralised organisation we manage risks where they arise using a consistent Group-wide approach in order to obtain an overall view of the risks in life and health reinsurance. Our global underwriting guidelines provide underwriters with an appropriate framework for this purpose.

#### C.1.4.1 Risk mitigation techniques Life & Health Reinsurance

In the Life & Health business group, retrocessions for the purpose of risk reduction are only used on a limited basis.

An index-based pandemic cover was structured in 2013 as a swap and, since then, has been placed with different investors in various tranches. The overall capacity placed is flexibly collateralised, such that the level of collateralisation can be increased depending on the current WHO pandemic alert phases.

Some large longevity deals are retroceded proportionally and on a regular premium basis in order to reduce the volatility of the longevity portfolio with regards to particular large contracts. Two sided collateral provisions ensure that future liabilities will be collateralised if receivables from or to the retrocessionaires are projected to exceed an agreed threshold.

The existing pool retrocessions for high sum assured individual policies mainly originate from times when a lower per life retention applied for the Hannover Re Group. For risk reduction reasons, they are no longer necessary and have been placed in run-off unless the retrocession is subject to attractive terms.

All other existing retrocessions are not placed for reasons of active risk reduction, but rather to maintain existing customer relationships, to get access to attractive fronting business or are placed with affiliates in order to reduce the HGB strains originating from large financing transactions.

The effectiveness of the retrocessions is closely linked to the default risk of the retrocessionaires. The monitoring of the default risk of retrocessionaires is performed across all business segments of Hannover Re in a standardized way, using standard systems and methods which are described in section C.3.

## C.2 Market risk

Faced with a challenging capital market climate, particularly high importance attaches to preserving the value of assets and the stability of the return. Hannover Re's portfolio is guided by the principles of a balanced risk / return profile and broad diversification. Based on a risk-averse asset mix, the investments reflect both the currencies and durations of our liabilities. Market price risks include equity risks, interest rate risks, foreign exchange risks, real estate risks, default and spread risks. Our portfolio currently consists in large part of fixed-income securities, and hence default and spread risks account for the bulk of the market risk. We minimise interest rate and foreign exchange risks through the matching of payments from fixed-income securities with the projected future payment obligations from our insurance contracts to a significant extent. Market risks derive from the investments managed by Hannover Re itself and from investment risks of ceding companies that we assume in connection with insurance contracts. The following table shows the risk capital with a confidence level of 99.5% for the market risks from investments under own and third-party management.

**Required risk capital for market risks**

Including private equity

in TEUR	2018	2017
Credit and spread risk	2,689,341	2,403,180
Interest rate risk	711,589	1,038,437
Foreign exchange risk	1,177,897	901,104
Equity risk	932,257	820,555
Real estate risk	608,858	549,456
Diversification	-2,286,470	-2,250,537
<b>Market risk</b>	<b>3,833,472</b>	<b>3,462,193</b>

Along with the larger volumes, elevated default and spread risks – as are also evident in the generally higher spread level – are a major reason for the increase in market risks.

With a view to preserving the value of our assets under own management, we constantly monitor adherence to a trigger mechanism based on a clearly defined traffic light system that is applied across all portfolios. This system defines clear thresholds and escalation channels for the cumulative fluctuations in fair value and realised gains / losses on investments since the beginning of the year. These are unambiguously defined in conformity with our risk appetite and trigger specified information and escalation channels if a corresponding fair value development is overstepped.

Interest rate and spread markets were relatively volatile over the course of the year under review. Needless to say, our conservatively oriented investment portfolio was not left unaffected by these market movements. While EUR interest rates were rather stable on a low level, USD and GBP interest rates recorded appreciable increases and risk premiums on corporate bonds fluctuated sharply during the year before settling for the most part on a substantially higher level at year-end than at the beginning of the reporting period. A significant decrease – albeit one in line with our planning – was thus booked in the hidden reserves for fixed-income securities over the year as a whole.

The predefined discussion and analysis mechanisms in connection with a triggering of the early-warning system's escalation levels reached the assessment in each case that the general market movements would not have any intolerable or strategy-altering implications for our portfolio or our economic capitalisation. For this reason, our trigger system did not cause us to make any changes to the asset allocation in the reporting period.

The short-term loss probability measured as the Value at Risk (VaR) is another vital tool used for operational monitoring and management of the market price risks associated with our securities positions. It is calculated on the basis of historical data, e.g. the volatility of the securities positions under own management and the correlation between these risks. As part of these calculations the decline in the fair value of our securities portfolio is simulated with a certain probability and within a certain period. The VaR of the Hannover Re Group determined in accordance with these principles specifies the decrease in the fair value of our securities portfolio under own management that with a probability of 95% will not be exceeded within ten trading days. A standard market model is used to calculate the VaR indicators for the Hannover Re Group; the risk model used in the previous reporting period was replaced with a more state-of-the-art variant in the year under review as part of our continuous efforts to strengthen our risk models. It is based on historical time series of relevant market parameters (equity prices, yield curves, spread curves and exchange rates). Against the backdrop of what was still a difficult capital market and interest rate environment, volatilities – especially of fixed-income assets – were again on a high level in the year under review.

Based on continued broad risk diversification and the orientation of our investment portfolio, our VaR was nevertheless clearly below the VaR upper limit defined in our investment guidelines. It amounted to 0.5% as at the end of the reporting period.

Stress tests are conducted in order to be able to map extreme scenarios as well as normal market scenarios for the purpose of calculating the Value at Risk. In this context, the loss potentials for fair values and shareholders' equity (before tax) are simulated on the basis of already occurred or notional extreme events.

### Scenarios for changes in the fair value of material asset classes

in TEUR	Scenario	Portfolio change on a fair value basis	
		2018	2017
Equity securities and private equity	Share prices -10%	-92,555	-81,384
	Share prices -20%	-185,109	-162,769
	Share prices +10%	+92,555	+81,384
	Share prices +20%	+185,109	+162,769
Fixed-income securities	Yield increase +50 basis points	-906,447	-848,386
	Yield increase +100 basis points	-1,769,214	-1,652,088
	Yield decrease -50 basis points	954,544	880,337
	Yield decrease -100 basis points	1,961,562	1,802,918
Real Estate	Real estate market values -10%	-237,940	-213,917
	Real estate market values +10%	+237,940	+213,917

Further significant risk management tools – along with the various stress tests used to estimate the loss potential under extreme market conditions – include sensitivity and duration analyses and our asset / liability management (ALM). The internal capital model provides us with quantitative support for the investment strategy as well as a broad diversity of VaR calculations. In addition, tactical duration ranges are in place, within which the portfolio can be positioned opportunistically according to market expectations. The parameters for these ranges are directly linked to our calculated risk-bearing capacity. It should be borne in mind that the issued subordinated bonds and resulting induced interest rate exposure are actively factored into our ALM.

Equity risks derive from the possibility of adverse changes in the value of equities, equity derivatives or equity index derivatives in our portfolio. Their relevance to our investments decreased sharply in the year under review, however, because we liquidated our holdings of non-strategic listed equities and equity funds at the end of the previous year. This leaves only a minimal portfolio in the context of strategic holdings. Our exposure to the private equity market remains unchanged. Changes in fair value here tend to be prompted less by general market conditions and more by entity-specific assessments. The risks are associated principally with the business model and profitability and less so with the interest rate component in the consideration of cash flow forecasts.

By far the largest part of our assets under own management is invested in fixed-income securities. They are exposed to the interest rate risk. Declining market yields lead to increases and rising market yields to decreases in the fair value of the fixed-income securities portfolio. The credit spread risk should also be mentioned. The credit spread refers to the interest rate differential between a risk-entailing bond and risk-free bond with the same maturity. Changes in these risk premiums, which are observable on the market, result – analogously to changes in pure market

yields – in changes in the fair values of the corresponding securities. We minimise interest rate risks by matching the durations of payments from fixed-income securities as closely as possible with the projected future payment obligations under our insurance contracts.

Foreign exchange risks are especially relevant if there is a currency imbalance between the technical liabilities and the assets. Through matching of currency distributions on the assets and liabilities side, we reduce this risk on the basis of the individual balance sheets within the Group. The short-term Value at Risk therefore does not include quantification of the foreign exchange risks. We regularly compare the liabilities per currency with the covering assets and optimise the currency coverage by regrouping assets. In so doing, we make allowance for collateral conditions such as different accounting requirements. Remaining currency surpluses are systematically quantified and monitored within the scope of economic modelling.

Real estate risks result from the possibility of adverse changes in the value of real estate held either directly or through fund units. They may be caused by a deterioration in particular qualities of a property or by a general downside in market values. Real estate risks continued to grow in importance for our portfolio owing to our ongoing involvement in this sector. We spread these risks through broadly diversified investments in high-quality markets worldwide; each investment is preceded by detailed analyses of the property, manager and market concerned.

We use derivative financial instruments to a limited extent, only. The primary purpose of such financial instruments is to hedge against potentially adverse developments on capital markets. A portion of our cash flows from the insurance business as well as foreign exchange risks arising because currency matching cannot be efficiently achieved are hedged to some extent using forward exchange transactions. Hannover Re holds further derivative financial instruments to hedge interest rate risks from loans taken out to finance real estate. In addition, Hannover Re holds hedges in the form of equity swaps to hedge price risks in connection with the stock appreciation rights granted under the share award plan. These are intended to neutralise changes in the fair values of the awarded stock appreciation rights. Contracts are concluded with reliable counterparties and for the most part collateralised on a daily basis so as to avoid credit risks associated with the use of such transactions. The remaining exposures are controlled according to the restrictive parameters set out in our investment guidelines.

Derivatives connected with the technical account play a minor role in Hannover Re's portfolio.

Our investments entail credit risks that arise out of the risk of a failure to pay (interest and / or capital repayment) or a change in the credit status (rating downgrade) of issuers of securities. We attach equally vital importance to exceptionally broad diversification as we do to credit assessment conducted on the basis of the quality criteria set out in the investment guidelines. We measure credit risks in the first place using the standard market credit risk components, especially the probability of default and the potential amount of loss – making allowance for any collateral and the ranking of the individual instruments depending on their effect in each case.

We then assess the credit risk first on the level of individual securities (issues) and in subsequent steps on a combined basis on the issuer level. In order to limit the risk of counterparty default we set various limits on the issuer and issue level as well as in the form of dedicated rating quotas. A comprehensive system of risk reporting ensures timely reporting to the functions entrusted with risk management.

### C.3 Credit risk

The credit risk or counterparty default risk consists primarily of the risk of complete or partial failure of the counterparty and the associated default on payment. The following table shows the required risk capital for counterparty defaults as at 31 December. This includes counterparty risk from retrocessionaires, cedants and short-term money held at banks but not credit risk from investments. The latter is covered under market risk, see previous section.

#### Required risk capital (confidence level 99.5%)

in TEUR	2018	2017
Counterparty default risk	312,553	281,958

The increase in counterparty default risks can be attributed principally to a higher volume of receivables due from ceding companies and retrocessionaires as well as elevated volatility of the modelled losses due to generally increased credit spreads.

Since the business that we accept is not always fully retained, but instead portions are retroceded as necessary, the counterparty default risk is also material for our company in reinsurance transactions. Our retrocession partners are carefully selected and monitored in light of credit considerations in order to keep the risk as small as possible. This is also true of our broker relationships, which entail a risk inter alia through the potential loss of the premium paid by the cedant to the broker. We minimise these risks, among other things, by reviewing all broker relationships once a year with an eye to criteria such as the existence of professional indemnity insurance, payment performance and proper contract implementation. The credit status of retrocessionaires is continuously monitored. On the basis of this ongoing monitoring a Security Committee decides on measures where necessary to secure receivables that appear to be at risk of default. This process is supported by an application, which specifies cession limits for the individual retrocessionaires participating in protection cover programmes and determines the capacities still available for short-, medium- and long-term business. Depending on the type and expected run-off duration of the reinsured business, the selection of reinsurers takes into account not only the minimum ratings of the rating agencies Standard & Poor's and A.M. Best but also internal and external expert assessments (e.g. market information from brokers). Overall, retrocessions conserve our capital, stabilise and optimise our results and enable us to act on opportunities across a broader front, e.g. following a major loss event. Regular visits to our retrocessionaires give us a reliable overview of the market and put us in a position to respond quickly to capacity changes. The following table shows the proportion of assumed risks that we do not retrocede (i.e. that we keep in our retention):

#### Gross written premium retained

in %	2018	2017
Hannover Re Group	90.7	90.5
Property and casualty reinsurance	90.7	89.7
Life and health reinsurance	90.7	91.7

Alongside traditional retrocessions in property and casualty reinsurance we also transfer risks to the capital market. Please refer also to chapter C.1.3.

Counterparty default risks are also relevant in life and health reinsurance, among other things because we finance acquisition costs for our ceding companies. Our clients, retrocessionaires and broker relationships as well as our investments are therefore carefully evaluated and limited in light

of credit considerations and are constantly monitored and controlled within the scope of our system of limits and thresholds.

69.6% of our recoverables from reinsurance business are secured by deposits or letters of credit. For many of our retrocessionaires we also function as reinsurer, meaning that in most cases recoverables can potentially be set off against our own liabilities.

The average default rate from retrocessions over the past four years was 0.09%.

Retrocession gives rise to claims that we hold against our retrocessionaires. These reinsurance recoverables – i.e. the reinsurance recoverables on unpaid claims – amounted to TEUR 2,084,630 (TEUR 1,651,335) at the balance sheet date.

The following table shows of our reinsurance recoverables – split by rating quality – due from our retrocessionaires.

#### Reinsurance recoverables as at the balance sheet date

in TEUR	2018	2017
Secured	1,451,318	941,473
AAA		3,265
AA	244,718	278,090
A	344,579	352,485
≤ BBB, NR	44,016	76,022
<b>Total</b>	<b>2,084,630</b>	<b>1,651,335</b>

## C.4 Liquidity risk

Liquidity risk refers to the risk of being unable to meet financial obligations when they become due. Liquidity risk consists of the refinancing risk (necessary cash could not be obtained or could only be obtained at increased costs) and the market liquidity risk (financial market transactions could only be completed at a poorer price than expected due to a lack of market liquidity). Core elements of the liquidity management of our investments are, in the first place, management of the maturity structure of our investments on the basis of the planned payment profiles arising out of our technical liabilities and, secondly, regular liquidity planning as well as the asset structure of the investments. Above and beyond the foreseeable payments, unexpected and exceptionally large payments may pose a threat to liquidity. In reinsurance business, however, significant events (major losses) are normally paid out after a lead time that can be reliably planned. As part of our liquidity management we have nevertheless defined asset holdings that have proven to be highly liquid – even in times of financial stress such as the 2008 financial crisis. Our holdings of unrestricted German, UK and US government bonds as well as cash during the year under review were larger than possible disbursements for assumed extreme events, which means that our liquidity is assured even in the unlikely case of financial crises coinciding with an extreme event that needs to be paid out quickly. In addition, we manage the liquidity of the portfolio by checking on each trading day the liquidity of the instruments contained therein. These measures serve to effectively reduce the liquidity risk.

For the “total amount of the expected profit included in future premiums” required by Art. 295 (5) of the Delegated Regulation 2015/35 please refer to the Quantitative Reporting Template S.23.01.22, item R0790. We do not use this figure for our liquidity management.

## C.5 Operational risk

Operational risks refer to the risk of losses occurring because of the inadequacy or failure of internal processes or as a result of events triggered by employee-related, system-induced or external factors. In contrast to underwriting risks (e.g. the reserve risk), which we enter into in a deliberate and controlled manner in the context of our business activities, operational risks are an indivisible part of our business activities. The focus is therefore on risk avoidance and risk minimisation.

With the aid of the Self-Assessment for Operational Risks we determine the maturity level of our operational risk management system and define action fields for improvements. The assessment is carried out, for example, by assessing the maturity level of the risk management function or of the respective risk monitoring and reporting. The system enables us, among other things, to prioritise operational risks. In order to calculate the capital commitment in our internal capital model we perform extensive scenario analyses and use the findings as a basis for specifying the parameters for the stochastic model. The following tables shows the required risk capital for the operational risk as at 31 December.

### Required risk capital (confidence level 99.5%)

in TEUR	2018	2017
Operational risk	575,329	637,035

The decrease in operational risks can be attributed above all to updated assessments regarding the impact of individual scenarios.

Within the overall framework of operational risks we consider, in particular, business process risks and data quality risks, compliance risks, risks associated with the outsourcing of functions, fraud risks, personnel risks, information security risks and business interruption risks.

Business process risks are associated with the risk of deficient or flawed internal processes, which can arise as a consequence of an inadequate process organisation. We have defined criteria to steer the risk, leading to a high process quality. Data quality is also a highly critical success factor, especially within risk management because the validity of the internal model is crucially basing on the provided data, for instance.

Compliance risks are associated with the risk of breaches of standards and requirements, non-compliance with which may entail lawsuits or official proceedings with not inconsiderable detrimental implications for the business activities of the Hannover Re Group. Compliance with regulatory standards, the company's Code of Conduct, tax regulations, data privacy requirements as well as the stipulations of anti-trust and competition law have been defined as issues of particular relevance. In addition to that, the Hannover Re focuses on IT compliance requirements such as VAIT (Supervisory Requirements for IT in (Re)Insurance Undertakings). We use sanctions screening software on parts of the Hannover Re Group's portfolio and any claim information to filter out individuals who are subject to sanctions on account of a criminal or terrorist background. Suitable steps are taken if such individuals are identified. Business partners are also screened in this way. Responsibilities within the compliance organisation are regulated and documented Group-wide and interfaces with risk management have been put in place. The set of tools is rounded off with regular compliance training programmes.

Risks associated with the outsourcing of functions can result from such outsourcing of functions, services and / or organisational units to third parties outside Hannover Re. Mandatory rules have been put in place to limit this risk; among other things, they stipulate that a risk analysis is to be

performed prior to an outsourcing. In the context of this analysis, that is e.g. centrally coordinated for cloud services, a check is carried out to determine, inter alia, what specific risks exist and whether outsourcing can even occur in the first place. Additionally our external partners are assessed regularly by Due Diligence.

In selected market niches we transact primary insurance business that complements our reinsurance activities. In so doing, just as on the reinsurance side, we always work together with partners from the primary sector – such as insurance brokers and underwriting agencies. This gives rise to risks associated with such distribution channels, although these are minimised through the careful selection of agencies, mandatory underwriting guidelines and regular checks.

The proper functioning and competitiveness of the Hannover Re Group can be attributed in large measure to the expertise and dedication of our staff. In order to minimise personnel risks, we pay special attention to the skills, experience and motivation of our employees and foster these qualities through outstanding personnel development and leadership activities. Regular employee surveys and the monitoring of turnover rates ensure that such risks are identified at an early stage and scope to take the necessary actions is created.

Fraud risks refer to the risk of intentional violations of laws or regulations by members of staff (internal fraud) and / or by externals (external fraud), in order to gain a personal advantage. This risk is reduced by the internal control system as well as by the audits conducted by Group Auditing on a Group-wide and line-independent basis.

Information security risks arise, inter alia, out of the risk of the inadequate integrity, confidentiality, availability or authenticity of systems and information. By way of example, losses and damage resulting from the unauthorised passing on of confidential information, the malicious overloading of important IT systems or from computer viruses are material to the Hannover Re Group. Given the broad spectrum of such IT-related risks, which do not only encompass information security but rather the complete sphere of operational risks (so called IT risks), a diverse range of steering and monitoring measures and organisational standards, including for example the requirement to conclude confidentiality agreements with service providers, have been put in place for the entire company. In addition, our employees are made more conscious of such security risks through practically oriented tools provided online in the intranet, by way of training opportunities and through a staff information campaign.

When it comes to reducing business interruption risks, the paramount objective is the quickest possible return to normal operations after a crisis, for example through implementation of existing contingency plans. Guided by internationally accepted standards, we have defined the key framework conditions and – among other measures – we have assembled a crisis team to serve as a temporary steering body in the event of an emergency. The system is complemented by regular exercises and tests, which e.g. confirm our IT recovery ability. A leaflet is available setting out the correct behaviour in the event of a business interruption; this condenses in compact form the key information that all employees need to know, such as the information channels to use in a crisis situation.

Regular quarterly risk reporting to the Risk Committee and the Executive Board takes place with regard to all operational risks. Risks are also evaluated as part of the reporting.

## C.6 Other material risks

Of material importance to our company in the category of other risks are primarily emerging risks, strategic risks and reputational risks. Furthermore we are monitoring the contagion risk between single entities of the Hannover Re Group and in respect of the relation to the Talanx Group.

### C.6.1 Emerging risks

The hallmark of emerging risks is that the content of such risks cannot as yet be reliably assessed – especially on the underwriting side with respect to our portfolio. Such risks evolve gradually from weak signals to unmistakable tendencies. It is therefore vital to detect these risks at an early stage and then determine their relevance. For the purpose of early detection we have developed an efficient process that spans divisions and lines of business and we have ensured its linkage to risk management. Operational implementation is handled by an expert working group assembled specially for this task. The analyses performed by this working group are used Group-wide in order to pinpoint any necessary measures (e.g. the implementation of contractual exclusions or the development of new reinsurance products). By way of example, risks associated with possible climate change are analysed by this working group. Global warming would affect not only natural perils, but also human health, the world economy, the agricultural sector and much more besides. These problematic issues may also have implications for our treaty portfolio – in the form of increased loss frequencies and / or severities also opportunities such as increased demand for reinsurance products. Further examples of emerging risks include pandemics (transnational and transcontinental spreading of a disease), supply chain risks and autonomous machines. In 2018, specific attention has been given to climate change risk, artificial intelligence and microplastics.

### C.6.2 Strategic risks

Strategic risks derive from a possible imbalance between the corporate strategy of the Hannover Re Group and the constantly changing general business environment. Such an imbalance might be caused, for example, by incorrect strategic policy decisions, a failure to consistently implement the defined strategies and business plans or an incorrect allocation of resources. We therefore regularly review our corporate strategy in a multi-step procedure and adjust our processes and the resulting guidelines as and when required. We have defined performance criteria and indicators for operational implementation of the strategic principles and objectives; these are authoritative when it comes to determining fulfilment of the various targets. With the “Strategy Cockpit” the Executive Board and responsible managers have at their disposal a strategy tool that assists them with the planning, elaboration and management of strategic objectives and measures and safeguards their overall perspective on the company and its strategic risks. The process for the management of strategic risks continues to be assessed annually as part of the monitoring of business process risks.

Hannover Re writes business in many jurisdictions and is thus exposed to legal and regulatory changes in these jurisdictions. Prominent current aspects are the UK withdrawal from the EU and the change of the US tax legislation.

The terms of the United Kingdom’s withdrawal from the European Union have still not been determined. The possibility of the UK leaving the EU without an agreement continues to exist. Hannover Re is prepared for this and all other scenarios and a Group-wide working group has been set up to address readiness measures. The Hannover Re Life UK Branch will be materially affected.

In order to be able to continue its activities even after a “hard” Brexit, an application to operate under the so-called temporary permissions regime (TPR) has been filed and already approved by the financial regulator. Increased administrative expenses and higher capital costs cannot be ruled out over the medium term. Argenta Holdings Limited is a wholly owned subsidiary of Hannover Re that operates on a standalone basis in the United Kingdom and is already authorised as a member of Lloyd’s. We also write reinsurance business in the United Kingdom through companies in Hannover, Ireland and Bermuda. In this regard we do not anticipate any significant changes as a result of Brexit. All in all, our current analyses indicate that the implications of Brexit are manageable for Hannover Re.

The changes in tax legislation adopted by the US administration at the end of 2017 entered into force on 1 January 2018. They provide for new tax regulations that have far-reaching implications for subsidiaries operating in the United States. On the one hand, the reform cuts the corporate tax rate from 35% to 21%. On the other hand, the legislative package includes the introduction of the so-called “Base Erosion and Anti-Abuse Tax” (BEAT). In this connection, premiums for ceded insurance risks within the corporate group are also included in the taxable base and will in future be taxed at a rate of 5% to 12.5% (rising over the next nine years). We have undertaken some restructuring activities within the Group in order to avert this increased burden of taxation. Most notably, US life reinsurance business previously written through Hannover Re Ireland was transferred to a Bermuda-based subsidiary. The latter is subject to US taxation, thereby avoiding a substantial tax loss; the solvency ratio decreased, however, due to a higher risk margin for the Hannover Re Group.

### C.6.3 Reputational risks

Reputational risks refer to the risk that the trust put in our company by clients, shareholders, employees or the public at large may be damaged. This risk has the potential to jeopardise the business foundation of the Hannover Re Group. A good corporate reputation is therefore an indispensable prerequisite for our core business as a reinsurer. Reputational risks may arise out of all business activities conducted by the Hannover Re Group. Reputational damage may be caused, inter alia, by a data mishap that becomes public knowledge or financial difficulties on account of an underwriting risk. In addition to the risk identification methods already described, we use a number of different techniques for risk minimisation, such as our defined communication channels (e.g. Crisis Communication Guideline), a professional approach to corporate communications, tried and tested processes for specific crisis scenarios as well as our established Code of Conduct.

The Code of Conduct, in particular, and the system of governance described in chapter B are the basis for minimizing any sources of reputational risk.

### C.6.4 Contagion risks

Contagion risk refers to the risks originated by interactions between individual entities of Hannover Re Group, or in respect of the ultimate parent of Hannover Re, the HDI Group. More precisely, contagion risk is the propagation of the effect of a failure or financial distress of an institution in a sequential manner to other institutions, markets or systems, or to other parts of a financial group or financial conglomerate.

Hannover Re manages this risk by a strict look-through approach in its management systems.

## D. Valuation for Solvency purposes

A valuation principle assigns monetary values to sets of rights and obligations in a structured way. The decision on what rights and obligations need to be considered is one of the distinguishing features of the valuation principles.

Hannover Re's internal valuation approaches are based on economic valuation principles. In principle economic valuation assigns to each right or obligation the price at which this right or obligation would be traded in an arms-length transaction between willing and knowledgeable parties. This principle has the advantages of being:

- Objective, since transaction prices can (in theory) be simply observed and do not require any further input,
- Comprehensive, since a transaction would incorporate all potential cash flows arising from those rights or obligations. In particular there can be no off-balance sheet items within an economic valuation framework,
- Risk-adjusted, since trades between risk-adverse parties will always incorporate the price of risk.

Depending on the specific position being valued and the state of the market at the time of valuation, two different and mutually exclusive levels of valuation can be distinguished:

**Mark-to-market:** This is the prototypical and simplest level of economic valuation. It is applicable if the positions to be valued are quoted in an active market. In that case, the value of the position is just the market price. Examples for positions, which can be valued on a mark-to-market basis are US treasuries, blue chips or futures with standard maturities on broad indices, such as the S&P 500. In general, everything traded in a deep and liquid market can be valued on a mark-to-market basis.

**Market-consistent valuation (mark-to-model):** This principle applies if neither prices themselves nor all inputs required for generally accepted pricing models can be observed in active markets. Accordingly, at least some parameters and inputs will be based on judgmental, and thus subjective, decisions. The valuation of many investments and most insurance contracts falls within this category, which is why this level of valuation is the most important one within the internal model. For consistency of the valuation with mark-to-market principles, it is required that

1. Observable prices and model parameters derived from them are used wherever available,
2. Parameter estimates are unbiased and derived according to sound techniques based on statistics or expert judgment,
3. Unavoidable risk must be allowed for in the valuation, consistent with the prevailing market price of risk. For this, it does not matter whether the risk is caused by the cash flows themselves or due to uncertainties in models or parameter estimates. This allowance for risk is called the market value margin.

Unavoidable risk is defined as the risk, which cannot be replicated completely by instruments with mark-to-market or mark-to-model valuation. If it can be replicated by such instruments, the risk can be avoided by investing in the replicating portfolio and the price of the position will be identical to the price of the replicating portfolio. This follows from the law of one price which is valid under certain assumptions on the markets. Of course, the liquidity of the replicating portfolio is crucial for this argument to hold.

Many risks are hedgeable in principle but some positions in the resulting hedge portfolios might not be quoted in active markets. One example is credit risk of smaller or non-listed obligors, where in theory OTC CDS are available from certain counterparties but observable market prices are not. In addition, if the position cannot be replicated perfectly, i.e. if basis risk remains, this residual risk is still considered unavoidable and requires a market value margin.

On the other hand, a position might be valued on a mark-to-market basis although it is not hedgeable, examples being long positions in small caps or mutual funds. These can neither be shorted nor are derivatives on the underlying available. The terms unavoidable and non-hedgeable will be used synonymously below.

Non-hedgeable risk is allowed for in Hannover Re's economic valuation framework by decreasing assets and / or increasing liabilities with a risk margin. Hannover Re defines the risk margin for non-hedgeable risk as the market cost of capital required for the orderly run-off of all its rights and obligations.

### Fair value hierarchy according to IFRS

The fair value hierarchy according to IFRS, which reflects characteristics of the price data and inputs used for measurement purposes, is similar to Solvency II valuation methods and structured as follows:

- Level 1: Assets or liabilities measured at (unadjusted) prices quoted directly in active and liquid markets.
- Level 2: Assets or liabilities which are measured using observable market data and are not allocable to level 1. Measurement is based, in particular, on prices for comparable assets and liabilities that are traded on active markets, prices on markets that are not considered active as well as inputs derived from such prices or market data.
- Level 3: Assets or liabilities that cannot be measured or can only be partially measured using observable market inputs. The measurement of such instruments draws principally on valuation models and methods.

If input factors from different levels are used to measure a financial instrument, the level of the lowest input factor material to measurement is determinative. The operational units responsible for coordinating and documenting measurement are organisationally separate from the operational units that enter into investment risks. All relevant valuation processes and valuation methods are documented. Decisions on fundamental valuation issues are taken by a valuation committee that meets monthly.

### General valuation principles

The primary objective is an economic, market-consistent approach to the valuation of assets and liabilities. According to the risk-based approach in the internal steering processes as well as under Solvency II, when valuing balance sheet items on an economic basis, the risks that arise from a particular balance sheet item need to be considered, using assumptions that market participants would use in valuing the asset or the liability.

According to this approach, assets and liabilities should be valued as follows:

- Assets should be valued at the amount for which they could be exchanged between knowledgeable willing parties in an arm's length transaction.
- Liabilities should be valued at the amount for which they could be transferred, or settled, between knowledgeable willing parties in an arm's length transaction.

- The time value of money should be reflected, i.e. all cash flows are discounted. The discount rate should take the long-term asset management strategy into account, i.e. whether the company acts as held-to-maturity investor or not.
- When valuing liabilities no adjustment to take account of the own credit standing of the insurance or reinsurance undertaking shall be made.
- Assets and liabilities shall be valued based on the assumption that the undertaking will pursue its business as a going concern.
- Individual assets and liabilities are valued separately.
- The application of materiality, whereby the omissions or misstatements of items are material if they could, individually or collectively, influence the economic decisions that users make on the basis of the Solvency II balance sheet. Materiality depends on the size and nature of the omission or misstatement judged in the surrounding circumstances. The size or nature of the item, or a combination of both, could be the determining factor.
- The application of simplifications is feasible when the method is proportionate to the nature, scale and complexity of the risks inherent.

Unless otherwise stated, assets and liabilities other than technical provisions shall be recognised in conformity with the international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002.

- Valuation of assets and liabilities other than technical provisions shall be carried out, unless otherwise stated, in conformity with international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002 provided that those standards include valuation methods that are consistent with the valuation approach set out in Article 75 of Directive 2009/138/EC. If those standards allow for more than one valuation method, only valuation methods that are consistent with Article 75 of Directive 2009/138/EC can be used.
- Where the valuation methods included in international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002 are either temporarily or permanently not consistent with the valuation approach set out in Article 75 of Directive 2009/138/EC, insurance and reinsurance undertakings shall use the other valuation methods that have been deemed to be consistent with Article 75 of Directive 2009/138/EC.
- When valuing liabilities using fair value, the adjustment to take account of the own credit standing as required by IFRS 13 Fair Value Measurement has to be eliminated. When valuing financial liabilities this only applies to the subsequent adjustment after initial recognition.
- As a Guidance for marking-to-market and marking-to-model the guidance on fair value measurement within IFRS 13 may be used, for example the characteristics of inactive markets described in IFRS 13.

IFRS do not always require an economic valuation as envisaged by Article 75 of Directive 2009/138/EC.

As per 31 December 2018, Hannover Re makes use of the static volatility adjustment for the first time. The impact of the application of the volatility adjustment is displayed in section D.2.

## D.1 Solvency II balance sheet

### Difference in valuation

in TEUR	Item	Solvency II	IFRS "as-if"	IFRS
<b>Assets</b>				
Goodwill	R0010		85,588	85,588
Deferred acquisition costs	R0020		2,282,653	2,155,820
Intangible assets	R0030	37,232	174,228	169,006
Deferred tax assets	R0040	265,894	454,608	454,608
Property, plant & equipment held for own use	R0060	102,652	94,405	93,423
Investments (other than assets held for index-linked and unit-linked contracts)	R0070	41,729,838	41,358,255	41,102,710
Property (other than for own use)	R0080	1,952,795	1,684,932	1,684,932
Holdings in related undertakings, including participations	R0090	262,057	245,269	245,133
Equities	R0100	18,091	18,091	18,091
Equities - listed	R0110	18,091	18,091	18,091
Equities - unlisted	R0120	0		
Bonds	R0130	35,477,235	36,600,015	36,361,916
Government Bonds	R0140	18,938,621	21,704,394	21,528,194
Corporate Bonds	R0150	15,380,040	13,736,497	13,674,598
Structured notes	R0160	229,410	229,410	229,410
Collateralised securities	R0170	929,165	929,714	929,714
Collective Investments Undertakings	R0180	3,402,451	2,075,653	2,063,282
Derivatives	R0190	40,601	191,747	191,747
Deposits other than cash equivalents	R0200	419,589	385,531	380,590
Other investments	R0210	157,019	157,019	157,019
Assets held for index-linked and unit-linked contracts	R0220			
Loans and mortgages	R0230	13,980	22,702	22,702
Other loans and mortgages	R0260	13,980	22,702	22,702
Reinsurance recoverables from:	R0270	2,169,006	3,208,355	3,094,535
Non-life and health similar to non-life	R0280	1,585,243	2,111,267	1,997,447
Non-life excluding health	R0290	1,571,448	2,100,372	1,986,609
Health similar to non-life	R0300	13,796	10,895	10,838
Life and health similar to life, excluding health and index-linked and unit-linked	R0310	587,344	1,097,088	1,097,088
Health similar to life	R0320	417,081	364,086	364,086
Life excluding health and index-linked and unit-linked	R0330	170,264	733,002	733,002
Life index-linked and unit-linked	R0340	-3,582		
Deposits to cedants	R0350	3,189,132	10,866,606	10,864,641
Insurance and intermediaries receivables	R0360	4,100,240	4,343,504	3,935,406
Reinsurance receivables	R0370	89,877	75,733	40,372
Receivables (trade, not insurance)	R0380	246,529	241,932	229,834
Cash and cash equivalents	R0410	1,151,349	1,151,509	1,072,915
Any other assets, not elsewhere shown	R0420	147,568	148,560	1,187,078
<b>Total assets</b>	<b>R0500</b>	<b>53,243,298</b>	<b>64,508,637</b>	<b>64,508,637</b>

in TEUR	Item	Solvency II	IFRS "as-if"	IFRS
<b>Liabilities</b>				
Technical provisions – non-life	R0510	24,209,930	29,965,462	27,758,823
Technical provisions – non-life (excluding health)	R0520	22,431,296	27,503,524	25,324,649
TP calculated as a whole	R0530			
Best Estimate	R0540	21,882,335		
Risk margin	R0550	548,962		
Technical provisions - health (similar to non-life)	R0560	1,778,634	2,461,938	2,434,174
TP calculated as a whole	R0570			
Best Estimate	R0580	1,732,817		
Risk margin	R0590	45,817		
Technical provisions - life (excluding index-linked and unit-linked)	R0600	8,312,352	13,927,069	13,927,069
Technical provisions - health (similar to life)	R0610	2,387,312	2,902,960	2,902,960
TP calculated as a whole	R0620			
Best Estimate	R0630	2,207,039		
Risk margin	R0640	180,273		
Technical provisions – life (excluding health and index-linked and unit-linked)	R0650	5,925,039	11,024,108	11,024,108
TP calculated as a whole	R0660			
Best Estimate	R0670	4,416,830		
Risk margin	R0680	1,508,209		
Technical provisions – index-linked and unit-linked	R0690	-34,587		
TP calculated as a whole	R0700			
Best Estimate	R0710	-43,416		
Risk margin	R0720	8,829		
Contingent liabilities	R0740	6,649		
Provisions other than technical provisions	R0750	183,450	183,450	180,412
Pension benefit obligations	R0760	184,005	184,005	182,291
Deposits from reinsurers	R0770	499,077	4,580,915	4,580,915
Deferred tax liabilities	R0780	2,885,424	1,700,082	1,700,082
Derivatives	R0790	6,625	82,488	82,488
Debts owed to credit institutions	R0800	326,558	323,993	323,993
Financial liabilities other than debts owed to credit institutions	R0810	829,850	798,063	798,063
Insurance & intermediaries payables	R0820	763,562	846,595	826,956
Reinsurance payables	R0830	494,228	330,837	329,275
Payables (trade, not insurance)	R0840	407,265	407,265	405,808
Subordinated liabilities	R0850	1,617,143	1,493,112	1,493,112
Subordinated liabilities in BOF	R0870	1,617,143	1,493,112	1,493,112
Any other liabilities, not elsewhere shown	R0880	142,928	141,445	2,377,322
<b>Total liabilities</b>	<b>R0900</b>	<b>40,834,458</b>	<b>54,966,609</b>	<b>54,966,609</b>
<b>Excess of assets over liabilities</b>	<b>R1000</b>	<b>12,408,840</b>	<b>9,542,028</b>	<b>9,542,028</b>

For general differences in valuation between Solvency II and IFRS please refer to chapter D.

## Comparison to prior year

in TEUR	Item	Solvency II 2018	Solvency II 2017
<b>Assets</b>			
Intangible assets	R0030	37,232	86,567
Deferred tax assets	R0040	265,894	308,574
Pension benefit surplus	R0050		
Property, plant & equipment held for own use	R0060	102,652	100,606
Investments (other than assets held for index-linked and unit-linked contracts)	R0070	41,729,838	39,645,771
Property (other than for own use)	R0080	1,952,795	1,765,048
Holdings in related undertakings, including participations	R0090	262,057	235,728
Equities	R0100	18,091	19,166
Equities - listed	R0110	18,091	19,064
Equities - unlisted	R0120	0	102
Bonds	R0130	35,477,235	33,151,146
Government Bonds	R0140	18,938,621	16,336,012
Corporate Bonds	R0150	15,380,040	15,645,261
Structured notes	R0160	229,410	251,974
Collateralised securities	R0170	929,165	917,898
Collective Investments Undertakings	R0180	3,402,451	3,486,585
Derivatives	R0190	40,601	8,141
Deposits other than cash equivalents	R0200	419,589	847,615
Other investments	R0210	157,019	132,343
Assets held for index-linked and unit-linked contracts	R0220		
Loans and mortgages	R0230	13,980	16,750
Loans and mortgages to individuals	R0250		
Other loans and mortgages	R0260	13,980	16,750
Reinsurance recoverables from:	R0270	2,169,006	1,667,155
Non-life and health similar to non-life	R0280	1,585,243	975,361
Non-life excluding health	R0290	1,571,448	970,147
Health similar to non-life	R0300	13,796	5,214
Life and health similar to life, excluding health and index-linked and unit-linked	R0310	587,344	695,329
Health similar to life	R0320	417,081	447,475
Life excluding health and index-linked and unit-linked	R0330	170,264	247,854
Life index-linked and unit-linked	R0340	-3,582	-3,536
Deposits to cedants	R0350	3,189,132	3,279,539
Insurance and intermediaries receivables	R0360	4,100,240	3,481,171
Reinsurance receivables	R0370	89,877	135,656
Receivables (trade, not insurance)	R0380	246,529	214,205
Cash and cash equivalents	R0410	1,151,349	819,440
Any other assets, not elsewhere shown	R0420	147,568	129,883
<b>Total assets</b>	<b>R0500</b>	<b>53,243,298</b>	<b>49,885,316</b>

in TEUR	Item	Solvency II 2018	Solvency II 2017
<b>Liabilities</b>			
Technical provisions – non-life	R0510	24,209,930	21,992,793
Technical provisions – non-life (excluding health)	R0520	22,431,296	20,179,288
TP calculated as a whole	R0530		
Best Estimate	R0540	21,882,335	19,644,836
Risk margin	R0550	548,962	534,452
Technical provisions - health (similar to non-life)	R0560	1,778,634	1,813,505
TP calculated as a whole	R0570		
Best Estimate	R0580	1,732,817	1,764,009
Risk margin	R0590	45,817	49,496
Technical provisions - life (excluding index-linked and unit-linked)	R0600	8,312,352	8,473,751
Technical provisions - health (similar to life)	R0610	2,387,312	2,430,464
TP calculated as a whole	R0620		
Best Estimate	R0630	2,207,039	2,235,457
Risk margin	R0640	180,273	195,006
Technical provisions – life (excluding health and index-linked and unit-linked)	R0650	5,925,039	6,043,287
TP calculated as a whole	R0660		
Best Estimate	R0670	4,416,830	4,239,107
Risk margin	R0680	1,508,209	1,804,180
Technical provisions – index-linked and unit-linked	R0690	-34,587	-33,966
TP calculated as a whole	R0700		
Best Estimate	R0710	-43,416	-44,125
Risk margin	R0720	8,829	10,159
Contingent liabilities	R0740	6,649	6,649
Provisions other than technical provisions	R0750	183,450	181,346
Pension benefit obligations	R0760	184,005	177,786
Deposits from reinsurers	R0770	499,077	479,512
Deferred tax liabilities	R0780	2,885,424	3,085,518
Derivatives	R0790	6,625	20,499
Debts owed to credit institutions	R0800	326,558	253,925
Financial liabilities other than debts owed to credit institutions	R0810	829,850	31,493
Insurance & intermediaries payables	R0820	763,562	659,551
Reinsurance payables	R0830	494,228	367,686
Payables (trade, not insurance)	R0840	407,265	362,909
Subordinated liabilities	R0850	1,617,143	1,626,144
Subordinated liabilities in BOF	R0870	1,617,143	1,626,144
Any other liabilities, not elsewhere shown	R0880	142,928	128,479
<b>Total liabilities</b>	<b>R0900</b>	<b>40,834,458</b>	<b>37,814,077</b>
<b>Excess of assets over liabilities</b>	<b>R1000</b>	<b>12,408,840</b>	<b>12,071,239</b>

Solvency II recognition, valuation and presentation of balance sheet items follows regulatory requirements. The IFRS balance sheet is taken from Hannover Re Group's annual financial statements and shown in the column "IFRS" on the right hand side.

For the IFRS annual financial statements, IFRS 5 was applied for the planned sale of Inter Hannover. Assets and liabilities of Inter Hannover were presented separately (as assets held for sale and liabilities related to assets held for sale). When moving from IFRS to Solvency II balance sheet line items, those are presented as "Any other assets, not elsewhere shown" and "Any other liabilities, not elsewhere shown", respectively.

The column "IFRS 'as if'" re-allocates items that are presented under the rules of IFRS 5 to their original line item for better comparability.

Note that for allocation of investments under own management to Solvency II balance sheet items, detailed EIOPA regulations on classification as well as BaFin regulations (e.g. regarding collective investment undertakings) have to be followed and are not utilised for the IFRS balance sheet items.

Comparing Solvency II and IFRS balance sheets, Hannover Re Group classifies differences in recognition, valuation and presentation into the following categories:

- Adjustments of self-managed investments, which comprise market valuation vs. valuation at amortised cost for several, but not all self-managed investments under IFRS,
- Adjustments of technical items (incl. risk margin), where technical items are revaluated for Solvency II purposes as described in section D.2,
- Adjustments of other balance sheet items (without deferred taxes), which mostly consist of differences in recognition of balance sheet items for Solvency II vs. IFRS (e.g. intangible assets) as well as reclassifications, together with market valuation (e.g. of subordinated liabilities),
- Deferred tax, which comprises the effects on deferred tax assets and deferred tax liabilities when moving from IFRS to Solvency II valuation.

Those adjustments amounted to a difference in excess of assets over liabilities (including minorities) for Solvency II compared to IFRS of TEUR 2,866,813 as at the balance sheet date.

For the Solvency II balance sheet as at the balance sheet date, the principles of recognition, valuation and presentation remained unchanged compared to the previous period.

## D.2 Technical provisions

The technical provision (TP) under Solvency II is determined as the sum of the best estimate liability (BEL) and the risk margin (RM).

Cash flows are discounted with risk-free rates in line with EIOPA requirements. A matching adjustment is not applied. Furthermore, the risk-free yield curves are not adjusted as set out in Art. 308c of the directives 2009/138/EC.

A temporary deduction according to Art. 308d of the directives 2009/138/EC is not applied. Furthermore, the concept of calculating the “TP as a whole” is currently not applied.

Hannover Re was granted approval by the BaFin in 2018 to use volatility adjustments pursuant to § 82 VAG. This is intended to mitigate the effect of value fluctuations on the bond market. The volatility adjustment according to Article 77d of the Directive 2009/138/EC was applied for calculating the BEL. The following table shows the impact of a non-application of a volatility adjustment on the TP, the Solvency Capital Requirement (SCR) and the basic own funds and the amounts of own funds eligible to meet the SCR.

Even under a non-application of a volatility adjustment, the solvency ratio is still comfortable.

### Impact of non-application of a volatility adjustment

in TEUR	Amount with Long Term Guarantee measures and transitionals	Impact of volatility adjustment set to zero
Technical provisions	32,487,695	519,659
Basic own funds	12,634,559	-325,998
Eligible own funds to meet Solvency Capital Requirement	12,634,559	-325,998
Solvency Capital Requirement	5,135,387	29,607

For Solvency II purposes, all contracts have to be evaluated over the whole lifetime within the individual contract boundaries (ultimate view). The contract boundary is defined as the future date on which at least one of the following criteria is met:

- The (re)insurance undertaking has an unilateral right to terminate the contract.
- The (re)insurance undertaking has an unilateral right to reject premiums payable under the contract.
- The (re)insurance undertaking has an unilateral right to amend the premiums or benefits payable under the contract in such a way that the premiums fully reflect the risks.

In case no such condition is met, the policies are projected until their natural expiry.

The BEL is shown on a gross basis in the following, i.e. before the reduction of reinsurance recoverables, if not stated otherwise. The RM is shown on a net basis, i.e. reflecting the risk mitigating effect of retrocessions. This is consistent with the methodology used in the Solvency II balance sheet.

## Best Estimate Liability (BEL)

The calculation of the BEL is based on the projection of future cash in- and outflows including premiums, claims, and expenses. Best estimate assumptions are used in the calculation of the BEL. The expenses consist of direct administration expenses and costs of on-going operations.

Cash flows in connection with funds withheld (increase, decrease or interest on funds withheld) of the underlying business are usually netted against the liability cash flows. Exceptions from this rule are funds held with significant inherent capital market risk and funds withheld with insufficient offset possibilities with the respective liabilities. The respective amounts are shown separately on the asset side of the balance sheet, if applicable. The netting of the deposits has no impact on the own funds.

According to Solvency II there is a differentiation between business accepted – shown on the liability side – and business ceded – shown on the asset side. According to IFRS, the assignment to the asset and liability side, respectively, partially depends on the sign of the accounting figures.

For the Property & Casualty business, the TP does not include any financial options and guarantees (FOGs). For the Life & Health business, there is an immaterial amount of FOGs for US business. The latter is included in the BEL.

The projections are done separately for assumed and retroceded business using the same bases, methods and assumptions.

## Risk Margin (RM)

According to Art. 37 (1) of the delegated acts (EU) 2015/35, a uniform cost-of-capital approach is used for calculating the risk margin.

The Cost of Capital (CoC) factor is 6%. The required capital is the SCR under Solvency II according to Hannover Re's internal model. The allocation of the SCR to the lines of business reflects the contribution to the SCR (Art. 37). The allocated SCR contributions are projected to future periods using appropriate risk drivers for each line of business.

According to Solvency II principles, the risk margin of all legal entities is calculated on a standalone basis, thus there is no allowance for diversification effects between legal entities. Diversification is taken into account within a legal entity including diversification effects between Property & Casualty and Life & Health.

## D.2.1 Technical Provisions of Property and Casualty Reinsurance

This section provides information on the technical provisions held for property and casualty reinsurance and insurance. The next sections shows BEL and RM per line of business and the following section provides further detail on the valuation methods.

### D.2.1.1 Value of Technical Provisions

#### Gross technical provisions property & casualty by lines of business in TEUR

Line of business	BEL	RM	TP	TP IFRS	Difference SII and IFRS
General liability insurance	3,109,111	70,090	3,179,201	3,038,481	140,720
Workers' compensation insurance	129,526	2,711	132,236	274,672	-142,435
Income protection insurance	346,120	12,448	358,568	383,593	-25,025
Fire and other damage to property insurance	3,400,061	74,219	3,474,280	3,188,777	285,503
Motor vehicle liability insurance	1,467,187	50,756	1,517,944	2,273,712	-755,768
Credit and suretyship insurance	1,125,512	25,105	1,150,618	1,377,874	-227,256
Marine, aviation, transport	977,297	18,203	995,499	854,380	141,119
Other motor insurance	476,609	11,169	487,778	597,265	-109,487
Other insurance	194,179	4,329	198,508	195,921	2,587
Non-proportional health reinsurance	1,231,463	30,090	1,261,553	2,173,877	-912,324
Non-proportional property reinsurance	3,542,602	99,877	3,642,478	4,654,443	-1,011,964
Non-proportional marine, aviation and transport	957,933	21,445	979,378	1,426,629	-447,251
Non-proportional casualty reinsurance	6,657,551	174,336	6,831,887	9,525,838	-2,693,950
<b>Total Non-Life Obligation</b>	<b>23,615,152</b>	<b>594,779</b>	<b>24,209,930</b>	<b>29,965,462</b>	<b>-5,755,531</b>

The line of business "Other insurance" comprises assistance, legal expenses insurance, medical expense insurance and miscellaneous financial loss.

The business from the Inter Hannover is included in the technical provisions under Solvency II. As per 1 January 2019, the technical provisions under Solvency II decrease to TEUR 23,933,267 due to the partial sale of Inter Hannover to HDI Global SE.

### D.2.1.2 Valuation of Technical Provisions

For the calculation of the BEL under Solvency II the business of the company is split into homogeneous risk groups such that the nature, scale and complexity of the business is adequately taken into account.

In general, there are no deviations regarding the valuation methods between the different lines of business, therefore the valuation methods described in the following paragraphs are valid for all segments of property and casualty reinsurance.

The evaluation of the BEL is based on the estimation of future cash flows, including all expected (future) cash in- and outflows related to existing obligations taking into account the time value of money. The BEL is calculated separately with respect to the best estimate premium provisions and the best estimate claims provisions.

The Solvency II calculations to determine all relevant cash flows for premium and claims provision reflect a best estimate projection. The calculation of the BEL is based on gross data. Cash flows for premiums, claims and costs are modelled separately.

For the calculation, a whole-contract-view (with respect to the contractual agreements) is taken into account, i.e. all cash in- and outflows are projected to the economic ultimate within the contract boundaries.

The BEL comprises the sum of the discounted cash flows and is aggregated to the minimum lines of business according to Solvency II requirements.

For the calculation of the BEL, development pattern and estimated ultimates are applied on the homogeneous risk groups. The pattern and the ultimates are determined on run-off triangles using standard actuarial methods, in particular, variations of the Chain-Ladder-Method. The triangles are generated using up-to-date and trustworthy data.

The cash flows are discounted using the risk-free interest rates provided by EIOPA and converted to the reporting currency EUR using the exchange rate on the valuation date.

Overall, the described valuation bases, methods and assumptions ensure that the calculation of the BEL is proportionate to the nature, scale and complexity of the underlying risks.

### Reinsurance Recoverables

In general, the projection of the reinsurance recoverables is undertaken analogously to the principles applied for the calculation of technical (gross) provisions of property and casualty reinsurance.

The reinsurance recoverables are adjusted with regard to the expected loss upon default of the counterparty. This adjustment is determined separately and is based on the valuation of the probability of a default per counterparty over the whole lifetime – whether be it through insolvency or legal dispute – as well as the resulting change in cash flows due to loss per default at the respective time under consideration.

### D.2.1.3 Comparison with other provisions

#### Comparison to IFRS provisions

This section outlines the reconciliation of the net technical provisions from IFRS to the Solvency II.

#### Reconciliation Solvency II vs. IFRS in TEUR

Description	2018
<b>IFRS "net technical provisions" property and casualty (incl. unearned premium reserve)</b>	<b>27,854,195</b>
Reclassification / netting of deferred acquisition costs and contract deposits	-2,373,656
Discounting of cash flows	-2,347,299
Risk margin	594,779
Differences in actuarial estimates and business volume differences	-1,103,755
<b>Total revaluation effect from IFRS to Solvency II</b>	<b>-5,229,932</b>
<b>Solvency II net technical provisions property and casualty</b>	<b>22,624,263</b>

The individual items of the reconciliation refer to the following aspects:

- In „Reclassification“ we summarize items which are presented separate under IFRS but which are included in the technical provisions under Solvency II.
- Solvency II technical provisions are present values of future cash flows discounted at the risk-free interest rate, whereas under IFRS generally annuity reserves are discounted, only.
- The risk margin under Solvency II covers the costs of providing an amount of eligible own funds equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligations over their lifetime.
- Solvency II technical provisions are calculated as a probability weighted average, whereas under IFRS the technical provisions represent a more prudent best estimate. In addition, Solvency II takes a homogenous ultimate view while IFRS distinguishes earned and unearned loss and premium reserves. Both effects are presented as item “Differences in actuarial estimates and business volume differences”.

#### Comparison to BEL of last year

##### Comparison to prior year

in TEUR	2018	2017
BEL gross	23,615,152	21,408,845
BEL net	22,029,484	20,433,484
RM	594,779	583,948

Contrary to the previous year the table above shows the BEL net after adjustment for the counterparty default risk.

Compared to yearend 2017 the BEL significantly increased for the lines of business fire and other damage to property insurance and non-proportional property reinsurance. One reason for this development is the high impact from major losses. Further reasons are the significant increase of business volume in these lines of business, exchange rate effects as well as an analysis and more detailed consideration of estimations in respect of cash flows.

The BEL also increased in the lines of business general liability insurance, credit and suretyship insurance, other motor insurance, motor vehicle liability insurance and non-proportional casualty reinsurance. The main reasons are exchange rate effects and an increase in volume of new business.

## D.2.2 Technical Provisions Life & Health

In the next section the quantitative information with respect to BEL, RM, TP as well as a comparison with the IFRS liability is provided.

Details with respect to the basis of valuation, the valuation methods, and the main assumptions underlying the calculation of the TP are given in Section „D.2.2.2 Valuation of technical provisions“.

Material differences between the TP and the IFRS liability are explained in Section D.2.2.4.

### D.2.2.1 Quantitative Information on Technical Provisions Life & Health

The following companies comprise the Life & Health business for the Hannover Re Group

- Hannover Rück SE, Hannover
- E+S Rückversicherung AG, Hannover
- Hannover Life Reassurance Company of America, Orlando
- Hannover Life Re of Australasia Ltd, Sydney
- Hannover Re (Ireland) DAC, Dublin
- Hannover Life Reassurance Bermuda Ltd, Hamilton
- Hannover Life Reassurance Africa Ltd, Johannesburg.

The following table provides an overview of the liabilities of the segments. The index linked and unit linked business is shown in the life segment. This information is further explained in the following sections.

#### Technical Provisions Life & Health per line of business in TEUR

Line of Business	BEL	RM	TP	IFRS liability	Comparison IFRS / Solvency II
Life	4,373,414	1,517,038	5,890,452	11,024,108	-5,133,656
Health	2,207,039	180,273	2,387,312	2,902,960	-515,648
<b>Total</b>	<b>6,580,454</b>	<b>1,697,311</b>	<b>8,277,765</b>	<b>13,927,069</b>	<b>-5,649,304</b>

For certain business, cash flows from the funds withheld are included in the best estimate liability under Solvency II (please refer to Section D.2) which significantly reduces the Solvency II gross TP in comparison to the IFRS liability. Furthermore, the segmentation into the Life and Health lines of business is slightly different under Solvency II and IFRS. A reconciliation from the IFRS liability net of reinsurance to the Solvency II TP net of reinsurance is provided in Section D.2.2.4.

### D.2.2.2 Valuation of the technical provisions Life & Health

#### Valuation Basis

All business is valued employing current best estimate assumptions. The general methodology used for calculating the BEL, RM and TP is described in Section D.2.

For material treaties the BEL is calculated individually per treaty. Smaller treaties are combined in modelling groups. The calculation is based on weighted model points or – if available and material – based on individual policy data. The portfolio development is modelled using appropriate mortality and morbidity tables, respectively, as well as lapse rates. A certain part of the risk premium basis business is modelled based on a loss-ratio based approach.

#### Valuation Methods

Based on weighted model points (e.g. tariff, gender mix, entry age, policy term, reinsurance conditions) and policy data, respectively, as well as assumptions for mortality, morbidity, lapse and relevant interest rate curves, the portfolio development and all resulting reinsurance profit items (i.e. premium, commission, benefits, reserve changes, and interest) are projected into the future.

Assumed and retroceded business is projected separately. Management expenses are allocated to treaties / modelling groups and projected into the future. The BEL is calculated in the respective treaty currency and using currency specific interest rate curves.

Solvency II admissible simplified methods are not used for calculating the BEL and RM, respectively.

#### Material Assumptions for the Life & Health business (excluding Longevity Business)

Business is written all over the world with a wide range of different policy types, tariffs and mortality / morbidity tables.

For treaties projected individually, the calculation of the BEL is initially based on weighted model points (or detailed policy data). The assumptions are monitored when the accounts from the cedants are booked and adjusted, if necessary. The base mortality / morbidity table is usually the table used in pricing. Also here adjustments are made in case that the actual figures materially differ from expectation, or if other relevant information becomes available.

For the majority of the business in the US and UK market, specific mortality and morbidity assumptions are derived from Hannover Re's base standard tables and updated regularly. For financial solution and morbidity risk solution business in the US market, mortality / morbidity assumptions are set using best estimate pricing assumptions. Also they are validated regularly. The projection of structured financial transactions in the US market allows for counterparty recapture assumptions. Rates can be increased for certain health business in the US market. This circumstance is reflected in the projections since this is market practice of managing the business.

Lapse rates are set from the original pricing basis of the treaty and adjusted for actual experience where credible data exists and for changes of the internal view of longterm lapse rates.

The reinsurance conditions of the treaty are reflected in the calculation of the BEL.

With exception of mortality business in the US, UK and Irish market, no allowance for future mortality improvement is made.

For smaller treaties modelled in groups, more general assumptions are made. Base mortality / morbidity tables are chosen in order to be appropriate for the respective market covered by the modelling group calculation. Reinsurance conditions are representative for the respective modelling group. The assumptions are monitored based on the booked results per modelling group in the past and adjusted if necessary.

For a small portion of the individually modelled business as well as of the business modelled in groups, expected claims are based on claims ratios. I.e. instead of using explicit mortality / morbidity and lapse rates the claims are estimated via a certain proportion of the premium.

Generally, future management actions are only taken into account for the SCR calculations of certain American and Australian business. Therefore they affect only the RM via the SCR (determined with the internal model), but not the best estimate projections. There are some exceptions for our US business, most importantly, the US Mortality Solutions business. A detailed management action plan ("FMA Plan") has been implemented to address issues with a US mortality portfolio acquired in 2009. The expected cash flows from in-force management are reflected in the 2018 TP.

### Material Assumptions for the Longevity Business

The calculation of the BEL is based on policy data. Best estimate base mortality assumptions are set on a treaty level. Best estimate mortality improvement assumptions are set either by treaty or by country.

The assumptions are monitored when the accounts from the cedants are booked and adjusted, if necessary, or if other relevant insight emerges. Furthermore, detailed mortality studies are carried out to allow for a comparison between expectation and experience and to adjust if necessary.

### Assumptions Changes in Comparison to the Previous Reporting Period

The implementation of the management action plan for US mortality business led to higher than expected cedant recaptures. For the Hong Kong branch, the mortality and morbidity rates for long term life and disability business were adjusted. In addition, the mortality rates for UK mortality business were updated. All mentioned effects led to an increase in BEL. This increase was partially offset by an update of longevity assumptions for the UK market.

### Reinsurance Recoverables

For all retrocessions to third party reinsurers where the recoverable represents an asset to Hannover Re, a default adjustment according to their rating was included.

In total the reinsurance recoverables under Solvency II are positive (TEUR 583,762), i.e. this position is to be seen as an asset for Hannover Re and reduces the net Solvency II reserves.

The respective IFRS reinsurance recoverables amount to TEUR 1,097,088. One reason for the difference between Solvency II and IFRS is the inclusion of cash flows from deposits in the reinsurance recoverables under Solvency II (please refer to Section D.2). Further revaluation steps between IFRS and Solvency II are provided in Section D.2.2.4.

### Risk Assessment

The main area of uncertainty around the level of the TP relates to a potential deviation of actual experience from the underlying assumptions and the sensitivity of cash flows to changes in those assumptions. The Risk Margin can serve as an indicator of such uncertainty.

The most material uncertainty comes in the form of the longevity and mortality business. Longevity and mortality risks are the key driver to the overall level of uncertainty. This also becomes evident from the capital requirements under Solvency II presented in Section E.

For the mortality business, small changes in the mortality rates can have significant effects on the claims payments. However, for a significant share of the portfolio, this risk is largely mitigated by profit commission arrangements or by limits regarding the retention of the cedant such that changes in mortality rates would change the underlying cash flow pattern but would have a limited impact on the associated BEL. The mortality rates are well grounded from available data. For longer tailed products, in particular in the US and UK market, mortality improvement and expert setting can also play an important role. The valuation of the US mortality business reflects the expected cash flows from inforce management activity, most notably rate increases pursuant to the contractual rights.

Significant mortality risk is stemming from US mortality business. The actual mortality experience for the portfolio in question proved to be better than expected in 2018. We are monitoring the further development of the underlying mortality on an ongoing basis.

The valuation of this business reflects the expected cash flows from inforce management activity, most notably rate increases initiated in 2018 pursuant to our contractual rights. Uncertainty results since it is expected that some cedants will seek arbitration proceedings with respect to the implemented rate increases. Based on information currently available to us, we take a favorable view of our legal position.

The longevity business is very dependent on the appropriateness of the underlying mortality tables and mortality improvement assumptions in particular due to the long contractual period. While the premiums are known, the expected claim payments are sensitive to the underlying mortality table, and more importantly in the later years, the mortality improvement that is applied to the underlying table. The underlying mortality assumptions are based on copious amounts of data and experience studies, both internally held and industry accepted. However, a certain level of judgment is involved in assessing the applicability of historical mortality improvement observations for forward-looking purposes. In general, changes in the interest rates have little impact as to the cash flows; however, they can have a material impact on the discounting of the cash flows.

Changes in lapse rates are material for certain products as well, with a varying level of confidence based on product design and the experience available. The direction of the lapse effect is dependent on the treaty and type of reinsurance used. In aggregate, an increase in lapse rates would be more adverse in that Hannover Re Group would forgo positive expected future cash flows.

Pandemic risk is a tail risk, i.e. a risk with a low probability of occurrence but a potential high impact. It has no impact on the expected mortality claims used for the calculation of the BEL. However, pandemic risk is one of the key drivers of capital requirements and is therefore allowed for in the Risk Margin.

Morbidity risks, including Australian business, are another driver of uncertainty in the modelling of business.

Financing business is generally not or only moderately exposed to mortality or morbidity risks and thus experiences a low level of uncertainty. Repayment of the outstanding financing amount can diminish on a combination of adverse biometric experience and lapses, but this is accounted for in the Risk Margin. Cedant default risk is also accounted for in the Risk Margin.

### D.2.2.3 Comparison of the Technical Provision with the IFRS Liability

In the following, a reconciliation between IFRS and Solvency II liabilities is provided. The reconciliation steps are explained below. The figures are net of reinsurance recoverables.

#### Reconciliation from IFRS to Solvency II in TEUR

Reconciliation Step	Explanation	Amount
<b>(0)</b>	<b>IFRS liability net of reinsurance</b>	<b>12,829,981</b>
(1)	Deferred Acquisition Costs (DAC) and Contract Deposit (CD)	1,988,284
<b>(2)=(0)+(1)</b>	<b>Technical IFRS liability net of reinsurance</b>	<b>14,818,265</b>
(3)	Deposit cash flows are partially included in TP under Solvency II	-5,601,242
(4)	Risk Margin	1,697,311
(5)	Further differences in methods / assumptions	-3,220,331
<b>(6)=(2)+...+(5)</b>	<b>Solvency II TP net of reinsurance</b>	<b>7,694,002</b>

(1) DAC and CD are not applicable under Solvency II.

(3) Hereunder IFRS deposits are deducted which are netted for Solvency II purposes.

In the following, the sources of the differences in methods and assumptions are described.

(5a) The calculation of the BEL includes all future cash flows. For certain business, this means negative liabilities. In contrast, IFRS does not allow for negative liabilities.

(5b) The IFRS liability includes for certain treaties a provision for the risk of adverse deviation (PAD) in the form of buffers in the assumptions, but no further explicit risk margin like in the Solvency II methodology. The TP includes a risk margin but no buffers.

(5c) The BEL reflects current best estimate assumptions (e.g., regarding mortality, mortality improvements and lapse), whereas the IFRS assumptions are locked-in for certain business (depending on the IFRS / US GAAP FAS type).

(5d) The BEL (and the RM) is discounted with current risk free interest rates, whereas the IFRS liabilities are calculated using locked-in interest rates. The average valuation interest rate is higher than the current swap rates.

(5e) For some treaties the Solvency II contract boundaries (CB) differ from the contract boundaries under IFRS.

(5f) Due to different reporting deadlines under IFRS and Solvency II there may appear differences.

(5g) Reclassification from non-technical positions to technical items may cause further differences.

## E. Capital Management

This section presents the main elements of Hannover Re's capital management.

### E.1 Own Funds

#### E.1.1 Management of own funds

Hannover Re aims to achieve a capitalisation of at least 180% under Solvency II. In addition, a threshold of 200% is defined. Own funds are managed in such a way that the minimum capitalisation in the planning is not undercut. This is achieved through coordinated planning and management of all own funds components, dividend payments and the risk profile.

The capital management process contains a classification of all own funds components with regard to the Solvency II tiering specifications and an assessment of the availability of the different own funds components.

In general, it is our objective for our hybrid capital instruments to correspond with the tier 2 category requirements. The timing of each issue takes into account the current market conditions and our medium-term growth objectives. In case of a required replacement of a subordinated bond, the detailed replacement planning process normally begins a year before the regular call date.

Hannover Re Group's economic capital model is used for the evaluation of both the quantitatively measurable individual risks and also the overall risk position. The assumptions and calculation methods for the determination of the risk-bearing capacity of the company are recorded in the documentation of the risk model and in regular reports.

#### E.1.2 Tiering

The classification of own funds with regard to their ability to cover losses represents a central component of regulatory capital requirements pursuant to Solvency II. The individual components of the own funds will be classified into one of three quality classes ("tiers").

Own fund items classified under tier 1 possess the highest degree of quality, due to the fact that they are permanently available. They equalise verifiably unexpected losses, both during ongoing business operations and in the event of a company liquidation. Tier 2 refers to basic own funds and ancillary own funds which possess the ability to equalise losses incurred in the event of a company liquidation. Own fund items, which are not categorised under tier 1 or tier 2, are categorised under tier 3.

#### E.1.3 Basic own funds

The following table displays the composition of basic own funds held by Hannover Re Group as of 31 December 2018.

**Basic own funds**

in TEUR	2018	2017
Tier 1 unrestricted	10,935,567	10,635,845
Ordinary Share capital	120,597	120,597
Share premium account related to ordinary share capital	880,608	880,608
Reconciliation reserve	10,639,839	10,379,908
Non available minority interests at Group level	-705,477	-745,268
Tier 1 restricted	538,136	534,858
Subordinated liabilities	538,136	534,858
Tier 2	1,079,007	1,091,286
Subordinated liabilities	1,079,007	1,091,286
Tier 3	81,848	33,777
Net deferred tax assets	81,848	33,777
<b>Total</b>	<b>12,634,559</b>	<b>12,295,766</b>

Solvency II imposes restrictions on the availability of own funds to cover SCR. For Hannover Re restrictions arise from non-available minority interests at Group level which relate primarily to the minority interests in E+S Rück.

Tier 3 capital arises as a consequence of net deferred tax assets in subsidiaries of the Hannover Re Group.

Restrictions may arise from limitations to use tier 2 and tier 3 capital to meet SCR and MCR. Such restrictions do not arise for Hannover Re with respect to SCR coverage but with respect to the availability of tier 2 and tier 3 capital to cover MCR.

Funds which can effectively be used to cover the SCR or MCR are denoted as eligible own funds.

**Available and eligible own funds**

in TEUR	2018	2017
Available own funds	12,634,559	12,295,766
Eligible own funds to meet SCR	12,634,559	12,295,766
Eligible own funds to meet MCR	12,182,188	11,831,348

**E.1.3.1 Movement analysis of eligible own funds and solvency capital requirements**

The movement analysis of Solvency II eligible own funds in the year under consideration is presented in the table below.

**Eligible own funds and SCR movement analysis**

in TEUR	Eligible own funds	SCR
<b>Year end 2017</b>	<b>12,295,766</b>	<b>4,729,028</b>
Model changes	393,234	-46,340
Operating Impact	1,036,737	376,046
Market variances	-282,155	264,249
Taxes	-123,076	-187,596
Capital management	-685,948	-
<b>Year end 2018</b>	<b>12,634,559</b>	<b>5,135,387</b>

Model changes include internal model changes approved by the regulator in the course of the model governance process and in addition for own funds it includes model updates for the calculation of technical provisions. The main impact for both eligible own funds and SCR in the reporting period results from the introduction of the volatility adjustment.

Operating impacts mainly comprise the investment result, unwind, new business value and the P&C run-off result. They also include assumption changes and in the reporting period in particular write-offs for US mortality business. For the SCR the effect from operating experiences stems from an increased business volume and calibration changes.

Market variances comprise changes in eligible own funds and SCR due to changes of foreign exchange rates, interest rates, credit spreads and other financial market indicators. Market variances are driven by substantial credit spread changes during the reporting period that lead to a reduction in own funds and an increase in SCR as a result of increasing volatility.

All items are shown on a pre-tax basis, tax effects including tax payments and changes in deferred taxes are shown separately. The large SCR impact is mainly due to an increase in pre-tax SCR, which is caused by an increase in business volume.

Capital management comprises dividend payments and minor changes in foreseeable dividends.

**E.1.3.2 Reconciliation IFRS to Solvency II basic own funds**

Finally, we present the transition from IFRS shareholders' equity to Solvency II basic own funds.

**Reconciliation of IFRS shareholders' equity to Solvency II own funds**

in TEUR	2018	2017
<b>Shareholders' equity IFRS incl. minority interests</b>	<b>9,542,028</b>	<b>9,286,558</b>
Adjustments Solvency II to IFRS		
Adjustments of investments under own management	515,356	502,724
Adjustments of technical items (incl. risk margin)	4,062,828	3,980,302
Adjustments of other balance sheet items	-337,316	-274,702
Deferred tax	-1,374,056	-1,423,642
<b>Economic shareholders' equity incl. minority interests</b>	<b>12,408,840</b>	<b>12,071,239</b>
Foreseeable dividends	-685,948	-656,350
Subordinated liabilities	1,617,143	1,626,144
<b>Available economic shareholders' equity incl. minority interests</b>	<b>13,340,036</b>	<b>13,041,033</b>
Non available minority interests at Group level	-705,477	-745,268
<b>Total amount of basic own funds after deductions</b>	<b>12,634,559</b>	<b>12,295,765</b>

**E.1.3.3 Ordinary share capital**

The ordinary share capital (capital stock of Hannover Rück SE) stands at TEUR 120,597 as of the balance sheet date. The shares have been paid up in full. The capital stock is divided into 120,597,134 no-par value registered shares which carry both voting and dividend rights. Every share grants the same right to vote and same dividend entitlement. As at the balance sheet date no treasury shares were held by the company.

No new shares were issued in the reporting period.

The capital stock paid in and the corresponding issue premium in the capital reserve form the own funds bearing the highest degree of quality, which can be relied upon to equalise losses in the course of business operations.

**E.1.3.4 Share premium account related to ordinary share capital**

The issue premium in relation to the capital stock of Hannover Re Group stands at TEUR 880,608 as of the balance sheet date.

The share premium account is a separate item to which premiums, the amount between the value attained at the point in time of issuance and the value recorded in the capital stock, are transferred in accordance with national statutory provisions.

**E.1.3.5 Reconciliation reserve**

The reconciliation reserve pursuant to Solvency II represents an item of basic own funds attributable (in unlimited capacity) to category tier 1. It primarily comprises the excess of assets over liabilities, adjusted by the subscribed capital, the capital reserve and shareholder dividend payouts.

At the balance sheet date, the reconciliation reserve was TEUR 10,639,839.

The reconciliation reserve represents reserves (in particular retained earnings) less value adjustments (e.g. ring-fenced funds); it does, moreover, contain the differences between the accounting valuation pursuant to IFRS and the valuation pursuant to the Directive 2009/138/EC.

### E.1.3.6 Subordinated own funds

Hannover Re Group holds three subordinated loans in its portfolio at the balance sheet date, which fulfil the criteria stipulated under Solvency II pertaining to subordinated liabilities, and which thus can be categorised under basic own funds.

No new subordinated own funds were issued in the reporting period.

#### Subordinated own funds

in TEUR	2018	2017
Subordinated debts (Tier 1 – restricted)	538,136	534,858
Subordinated debts (Tier 2)	1,079,007	1,091,286
<b>Total</b>	<b>1,617,143</b>	<b>1,626,144</b>

On 15 September 2014 Hannover Rück raised a subordinated debt with a nominal value of TEUR 500,000 from capital markets. This debt is classified under Solvency II as “(grandfathered) restricted tier 1” own funds for a transitional period of a maximum of 10 years.

On 20 November 2012 and 14 September 2010, Hannover Rück placed two subordinated debts, each of an amount of TEUR 500,000 in the European capital market via its subsidiary Hannover Finance (Luxembourg) S.A. These subordinated debts are classified under Solvency II as (grandfathered) tier 2 own funds of Hannover Re Group.

### E.1.4 Transferability

Hannover Re Group actively manages its capital resources. Restraints in transferability arise due to minority interests in E+S Rück of TEUR 705,477. In the period under consideration, no further issues were identified that restrict the transferability of the capital for the covering of the solvency capital requirements. The transferability is checked regularly on the basis of stress tests.

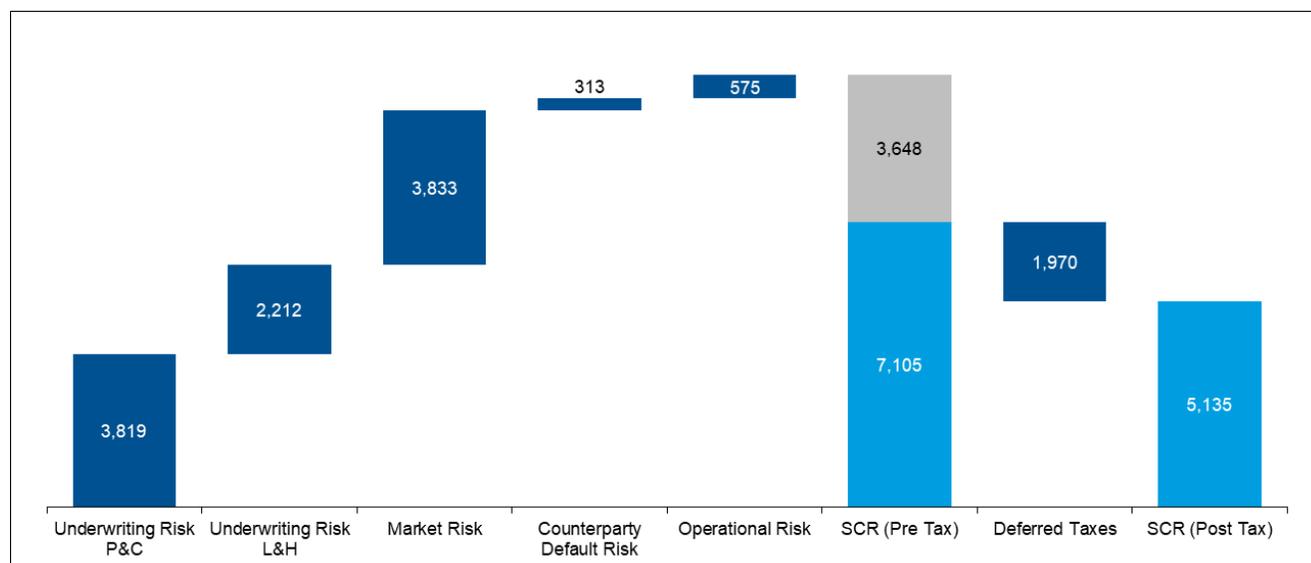
## E.2 Solvency Capital Requirement and Minimum Capital Requirement

### E.2.1 Solvency Capital Requirement per Risk Category

This chapter deals with the Solvency Capital Requirement and its sources. The risk categories of the internal model of Hannover Re are defined in Chapter E.4.1.4. Capital requirements per risk category are shown in the following.

### Solvency Capital Requirement – per risk category

in EUR million



### Solvency Capital Requirement (SCR)

in TEUR

Solvency Capital Requirement	2018	2017
Underwriting risk - Property & Casualty	3,819,254	3,485,449
Underwriting risk - Life & Health	2,212,474	2,354,658
Market risk	3,833,472	3,462,193
Counterparty default risk	312,553	281,958
Operational risk	575,329	637,035
Diversification	-3,648,048	-3,710,212
<b>Total risk (pre-tax)</b>	<b>7,105,035</b>	<b>6,511,081</b>
Deferred tax	1,969,648	1,782,052
<b>Total risk (post-tax)</b>	<b>5,135,387</b>	<b>4,729,028</b>

The required capital has been calculated based on the approved internal model. Hannover Re was also granted approval by the BaFin in 2018 to use volatility adjustments pursuant to § 82 VAG. This was implemented for the calculation of the required capital as at year-end 2018.

There are no capital add-ons imposed by the regulator.

Overall, the required capital increased in the course of the year. This was driven principally by the larger business volumes, which led to an increase in market risks and underwriting risks in property and casualty reinsurance. In addition, the weakening of the euro against the US dollar contributed to a rise in foreign-currency volumes and an increase in risks in euro.

Along with the larger volumes, elevated default and spread risks – as are also evident in the generally higher spread level – are a major reason for the increase in market risks. The underwriting risks in property and casualty reinsurance increased primarily as a consequence of higher underwriting capacities for natural perils and model adjustments made to specific large loss models. The underwriting risks in life and health reinsurance decreased due to a reduced exposure

to longevity and mortality risks. This contrasts with a higher exposure to morbidity risks resulting from expansion of the business. The increase in counterparty default risks can be attributed principally to a higher volume of receivables due from ceding companies and retrocessionaires as well as elevated volatility of the modelled losses due to generally increased credit spreads. The decrease in operational risks can be attributed above all to an updated expert assessment regarding the impact of individual scenarios.

The loss-absorbing effect of taxes remained stable. The slight decline in the diversification effect reflects the increase in certain key risks, namely the market risk and the underwriting risk in property and casualty reinsurance.

The following table displays the Solvency Capital Requirement and the ratio of eligible own funds to SCR taking into account tiering restrictions.

**Ratio of eligible own funds to Solvency Capital Requirement**

in TEUR	2018	2017
Eligible own funds	12,634,559	12,295,766
SCR	5,135,387	4,729,028
<b>Ratio of eligible own funds to SCR</b>	<b>246%</b>	<b>260%</b>

**E.2.2 Minimum Capital Requirement (MCR)**

The following table displays the Minimum Capital Requirement and the ratio of eligible own funds to MCR taking into account tiering restrictions.

**Ratio of eligible own funds to Minimum Capital Requirement**

The group MCR is the result of the sum of the MCRs of the different legal entities.

in TEUR	2018	2017
Eligible own funds	12,182,188	11,831,348
MCR	3,542,422	3,303,225
<b>Ratio of eligible own funds to MCR</b>	<b>344%</b>	<b>358%</b>

**E.3 Use of the duration-based equity risk sub-module in the calculation of the Solvency Capital Requirement**

Germany did make no use of the option to allow the utilisation of a duration-based equity risk sub-module.

Consequently, Hannover Re does not use a duration-based equity risk sub-module in the calculation of the Solvency Capital Requirement.

## E.4 Differences between the standard formula and any internal model used

### E.4.1 The internal model

Hannover Re received approval from the regulatory authorities to calculate its solvency requirements using a partial internal capital model with effect from the entry into force of Solvency II on 1 January 2016. The capital requirements for underwriting risk P&C and L&H, market risk and counterparty default risk are determined according to the internal model, the capital requirements for operational risks were calculated according to the Solvency II standard formula. In 2017, Hannover Re Group additionally received permission from the Federal Financial Supervisory Authority (BaFin) to calculate the operational risk using the internal model on group level and thus has a full internal model.

This section provides further information regarding the internal capital model.

#### E.4.1.1 Introduction

The quantitative risk management of Hannover Re provides a standardised framework for the assessment and management of all risks facing our undertaking and capital position. In this context, the internal model is our key instrument. It is a stochastic enterprise model, covering all subsidiaries and business areas of Hannover Re.

The central key figure in risk and company management is the economic capital, which is evaluated according to market-consistent valuation principles and the basis for calculation of the Solvency II capital.

The internal model of Hannover Re reflects all risks influencing the development of the economic capital. These risks are classified into underwriting, market, counterparty default and operational risks. For each of these risk categories, we have determined a series of risk factors for which we define a probability distribution. Risk factors are, as for instance, economic indicators, like interest rates, exchange rates and inflation rates, as well as insurance-specific indicators such as the mortality rates in a specific age group of our insurance portfolio in a certain country, or the number of natural disasters in a certain region and the insured loss per disaster.

We use publicly accessible and historical data to specify the probability distributions of risk factors. In addition, we use industry specific and internal (re-)insurance data of Hannover Re. The judgement of internal and external experts supplements this process. The suitability of probability distributions is subject to regular review by our specialist departments and verified in conjunction with the regular, company-wide application of the capital model and allocation of costs of capital. Hannover Re calculates the required capital using the Value at Risk (VaR) reflecting the changes in economic value over a period of one year with a confidence level of 99.97%. This is equivalent to the target to limit the ruin probability over a horizon of one year to 0.03%. The internal target capitalisation of Hannover Re is significantly larger than that to a confidence level of 99.5% as required by Solvency II.

The internal capital model uses state of the art techniques of insurance and financial mathematics. In case of underwriting risks, we draw on a comprehensive history of internal data to estimate probability distributions, e.g., for reserving risk. In the context of natural catastrophe risks, we use external models that we adjusted in the course of detailed internal reviews to represent our risk profile adequately. For Life and Health reinsurance we determine long-term cash flows for different scenarios. The determination of scenarios and probability distributions is based on internal data for

all mentioned risks. The internal data base is enriched with parameters set by experts. These parameters are of importance in particular in the area of extreme events that have not been observed by now.

The aggregation of single risks takes into account dependencies between risk factors. Dependencies arise, e.g., during financial crises, which affect several market segments at the same time. Furthermore, market phenomena such as pricing cycles can cause dependencies over time. We generally assume that extreme events do not occur all simultaneously. The absence of complete dependency is denoted as diversification. Hannover Re's business model is based i.a. on establishing a preferably well-balanced portfolio such that a significant diversification effect is achieved and the capital can be used efficiently. Diversification effects exist between reinsurance contracts, divisions, business segments and risks. Given the costs of capital of our business segments, divisions and on their contribution to the diversification effect, we determine the costs of capital that have to be achieved per single business units.

#### E.4.1.2 Basic principles

A key purpose of the capital model of Hannover Re relates to the calculation of the required and available capital for Hannover Re. The principles outlined below are the manifestation of Hannover Re's risk capacity and how it is consistently measured within a quantitative framework.

- Target variable: Our main target variable for the calculation of risk based capital is the deviation of the net asset value (or own funds) from its expected value.
- Time horizon: For calculating the required capital a one-year time horizon is considered.
- Risk measure: We use two statistics to measure and allocate risk capital, namely the Value-at-Risk (VaR) and the Expected Shortfall (ES).
- Ongoing business operations: We operate on the premise of existing business and a going-concern assumption.
- New business assumptions: We consider one year of new business. This assumption holds for all lines of business.
- Stochastic simulation: The capital model of Hannover Re is based on stochastic simulations, i.e. we generate discrete approximations for the probability distribution of our target variables.
- Capital fungibility: Hannover Re's capital model covers the risks stemming from several (legally independent) business units within the Group. We assume full capital fungibility. This is based on the assessment of stress tests for capital fungibility and transferability.
- Consolidation method: The capital model of Hannover Re comprises all business units by using the consolidation method. Deduction and aggregation as defined under Solvency II as an alternative method is not applied.

The capital model uses a stochastic simulation model for the purposes of implementing these principles, which combines random variables using the company-specific dependency structure.

#### E.4.1.3 Main applications

Hannover Re considers its internal capital model a key component of its enterprise risk management system to analyse its overall risk position, to quantify risks and to determine the economic capital required to meet those risks.

The results of Hannover Re's internal model provide support to senior management of Hannover Re in their decision-making. Main applications are:

- Assessment of the overall required capital
- Capital consumption by each risk category
- Capital allocation for pricing and performance measurement
- Risk budgeting, limit allocation and monitoring
- Assessment of risk mitigation strategies
- Strategic asset allocation
- Assessment of new business

#### **E.4.1.4 Scope of the model**

Hannover Re's complete risk landscape comprises the main risk categories underwriting risks (life and non-life), market risks, counterparty default risks, operational risks and other risks (see chapter "C. Risk Profile").

The risk categories addressed by the internal model of Hannover Re using a quantitative model are the categories underwriting risk life, underwriting risk non-life, market risk, counterparty default risk and operational risk. These risks and their interactions are accounted for in the presentation of target variables through the application of stochastic simulation models. Concentration risk is taken into account in the calculations of required capital for each risk category.

### **E.4.2 Calculation techniques for the purposes of integrating results into the standard formula**

With the approval of the internal model for operational risk, Hannover Re uses a full internal model. In consequence, there are no results of standard formula modules which have to be integrated in the internal model.

#### **E.4.2.1 Type and suitability of data**

Hannover Re has a comprehensive internal control system in place to ensure quality and timeliness of data. The specific data used in the internal model is documented in the data requirements for the different modules and interfaces. All data used in the internal model is subject to the data standards for the internal model. This set-up is appropriate to provide for timely data that is free of material errors.

Hannover Re utilises the relevant historical company data, in order to calibrate the model – above all for the underwriting risk. Generally speaking, company data relating to insurance performance within non-life is available for more than 30 years. This is deemed sufficiently historical information. However, due to the particular characteristics of early underwriting years, e.g. low premium volume, changing business segmentation or non-representative market segments, only portions of this data are used as part of the internal model calibration.

Internal company data, above all for the model validation, is used for underwriting risk pertaining to life and health insurance, due to the fact that only a limited number of significant (and thus rare) deviations are available that are suitable for the calibration of extreme events.

Long-term market data is used for the calibration of the market and counterparty risk model.

The operational risk model is based on information retrieved from a self-assessment process with experts from all relevant units and departments. Wherever possible available data and additional information are used. Given the limited history of operational risk events as well as the low frequency and high severity character of some operational risks, Hannover Re is convinced that input parameters for the SCR calculation cannot be solely derived by quantitative methods.

In general, Hannover Re relies on data that is used in other business applications, too, as often as appropriate to ensure consistent use of information within the company. Examples are the technical provisions which are calculated as part of the Solvency II balance sheet process and data items used in the accounting process under IFRS, thereby providing an anchor to other established reporting processes. Thus, many data items are subject to multiple quality checks and internal as well as external review.

#### **E.4.3 Comparison between the internal model and the standard formula**

The standard formula is designed to fit a typical European (or EEA) primary insurer. As a consequence, mainly European data has been used to calibrate the standard formula.

There are many aspects which make Hannover Re quite different from a typical European primary insurer, in particular, its access to global diversification across regions, markets, cedants and all lines of business. The difference in diversification is the driving force of differences between the standard formula and the internal model for life, health and non-life underwriting risk. It also has some influence on counterparty and market risk.

The standard formula offers a detailed module for the quantification of EU natural catastrophe risk. Due to its focus it does offer a very broad, premium-based approximation for non-EU and non-proportional natural catastrophe risk, only. Hannover Re assumes more than 70% of its natural catastrophe risk outside the EU and thus has a detailed internal model for such risks.

The standard formula is designed for a single primary insurer and thus has no module to recognise diversification between different primary insurers. The latter is an important feature of Hannover Re's internal model and founded on Hannover Re's internal data analysis.

The standard formula allows for appropriate recognition of some but not all reinsurance structures. For example multi-line covers are not fully effective. The internal model is able to recognise all retrocession structures currently implemented by Hannover Re.

Technically, the internal model is a stochastic approach while the standard formula is a factor-based (deterministic) approach. The concept for underlying risk factors is in many areas similar, e.g. for market and counterparty risk but in general more detailed in Hannover Re's internal model. Hannover Re's internal model allows for bottom-up, non-linear dependency structures within and between market, underwriting, operational and counterparty risk.

#### **E.5 Non-compliance with the Minimum Capital Requirement and non-compliance with the Solvency Capital Requirement**

Both solvency and minimum capital requirements were complied with at all times during the period under consideration.

## Abbreviations and glossary

**AF:** Actuarial function

**BaFin:** Bundesanstalt für Finanzdienstleistungsaufsicht, Federal Financial Supervisory Authority

**BEL:** Best Estimate Liability

**BOF:** Basic own funds

**CDS:** Credit Default Swap

**CEO:** Chief Executive Officer

**CFO:** Chief Financial Officer

**EBIT:** Earnings before interest and taxes

**EEA:** European Economic Area

**EIOPA:** European Insurance and Occupational Pensions Authority

**E+S Rück:** E+S Rückversicherung AG, Hannover

**GA:** Group Auditing, internal audit of Hannover Re

**Hannover Re:** Hannover Re Group, Hannover

**Hannover Rück:** Hannover Rück SE, Hannover

**HDI:** HDI Haftpflichtverband der Deutschen Industrie V.a.G., Hannover

**HGB:** Handelsgesetzbuch, German Commercial Code

**IAS:** International Accounting Standard

**IBNR:** provisions for claims incurred but not reported

**ICS:** Internal Control System

**IFRS:** International Financial Reporting Standards

**Inter Hannover:** International Insurance Company of Hannover SE, Hannover, since 1 January 2019: HDI Global Specialty SE, Hannover

**L&H:** Life and Health

**MCR:** Minimum Capital Requirement

**ORSA:** Own Risk and Solvency Assessment

**P&C:** Property and Casualty

**RM:** Risk margin

**RMF:** Risk Management Function

**SCR:** Solvency Capital Requirement

**SII:** Solvency II

**TP:** Technical provisions

**VAG:** Gesetz über die Beaufsichtigung der Versicherungsunternehmen (Versicherungsaufsichtsgesetz), Insurance Supervision Act

**VaR:** Value-at-Risk

**WpHG:** Gesetz über den Wertpapierhandel (Wertpapierhandelsgesetz), German Securities Trading Act

**WpÜG:** Wertpapiererwerbs- und Übernahmegesetz, German Securities Acquisition and Takeover Act

## Quantitative Reporting Templates

All values are shown in TEUR if not otherwise stated.

Values below TEUR 0.5 are displayed as "0". Empty cells represent the fact that Hannover Re has no value to state.

Hannover Re was granted approval by the BaFin in 2018 to use volatility adjustments pursuant to § 82 VAG. Thus the template "S.22.01.22 Impact of long term guarantees and transitional measures" does apply for the first time in the year under review.

### **Additional disclosure according to Art. 192 (2) of the Delegated Regulation 2015/35**

The Hannover Re Group has collateral arrangements with a total value well below 60% of total assets. The threshold of 60% is defined in Art. 192 (2) of the Delegated Regulation 2015/35. This information is relevant to calculate the counterparty default risk with respect to the Hannover Re Group in the Solvency II standard formula.

## S.02.01.02: Balance sheet

S.02.01.02: Balance sheet, page 1		Solvency II
Assets		C0010
Intangible assets	R0030	37,232
Deferred tax assets	R0040	265,894
Pension benefit surplus	R0050	
Property, plant & equipment held for own use	R0060	102,652
Investments (other than assets held for index-linked and unit-linked contracts)	R0070	41,729,838
Property (other than for own use)	R0080	1,952,795
Holdings in related undertakings, including participations	R0090	262,057
Equities	R0100	18,091
Equities - listed	R0110	18,091
Equities - unlisted	R0120	0
Bonds	R0130	35,477,235
Government Bonds	R0140	18,938,621
Corporate Bonds	R0150	15,380,040
Structured notes	R0160	229,410
Collateralised securities	R0170	929,165
Collective Investments Undertakings	R0180	3,402,451
Derivatives	R0190	40,601
Deposits other than cash equivalents	R0200	419,589
Other investments	R0210	157,019
Assets held for index-linked and unit-linked contracts	R0220	
Loans and mortgages	R0230	13,980
Loans on policies	R0240	
Loans and mortgages to individuals	R0250	
Other loans and mortgages	R0260	13,980
Reinsurance recoverables from:	R0270	2,169,006
Non-life and health similar to non-life	R0280	1,585,243
Non-life excluding health	R0290	1,571,448
Health similar to non-life	R0300	13,796
Life and health similar to life, excluding health and index-linked and unit-linked	R0310	587,344
Health similar to life	R0320	417,081
Life excluding health and index-linked and unit-linked	R0330	170,264
Life index-linked and unit-linked	R0340	-3,582
Deposits to cedants	R0350	3,189,132
Insurance and intermediaries receivables	R0360	4,100,240
Reinsurance receivables	R0370	89,877
Receivables (trade, not insurance)	R0380	246,529
Own shares (held directly)	R0390	
Amounts due in respect of own fund items or initial fund called up but not yet paid in	R0400	
Cash and cash equivalents	R0410	1,151,349
Any other assets, not elsewhere shown	R0420	147,568
<b>Total assets</b>	<b>R0500</b>	<b>53,243,298</b>

S.02.01.02: Balance sheet, page 2		Solvency II
<b>Liabilities</b>		<b>C0010</b>
Technical provisions – non-life	<b>R0510</b>	24,209,930
Technical provisions – non-life (excluding health)	<b>R0520</b>	22,431,296
Technical provisions calculated as a whole	<b>R0530</b>	
Best Estimate	<b>R0540</b>	21,882,335
Risk margin	<b>R0550</b>	548,962
Technical provisions - health (similar to non-life)	<b>R0560</b>	1,778,634
Technical provisions calculated as a whole	<b>R0570</b>	
Best Estimate	<b>R0580</b>	1,732,817
Risk margin	<b>R0590</b>	45,817
Technical provisions - life (excluding index-linked and unit-linked)	<b>R0600</b>	8,312,352
Technical provisions - health (similar to life)	<b>R0610</b>	2,387,312
Technical provisions calculated as a whole	<b>R0620</b>	
Best Estimate	<b>R0630</b>	2,207,039
Risk margin	<b>R0640</b>	180,273
Technical provisions – life (excluding health and index-linked and unit-linked)	<b>R0650</b>	5,925,039
Technical provisions calculated as a whole	<b>R0660</b>	
Best Estimate	<b>R0670</b>	4,416,830
Risk margin	<b>R0680</b>	1,508,209
Technical provisions – index-linked and unit-linked	<b>R0690</b>	-34,587
Technical provisions calculated as a whole	<b>R0700</b>	
Best Estimate	<b>R0710</b>	-43,416
Risk margin	<b>R0720</b>	8,829
Contingent liabilities	<b>R0740</b>	6,649
Provisions other than technical provisions	<b>R0750</b>	183,450
Pension benefit obligations	<b>R0760</b>	184,005
Deposits from reinsurers	<b>R0770</b>	499,077
Deferred tax liabilities	<b>R0780</b>	2,885,424
Derivatives	<b>R0790</b>	6,625
Debts owed to credit institutions	<b>R0800</b>	326,558
Financial liabilities other than debts owed to credit institutions	<b>R0810</b>	829,850
Insurance & intermediaries payables	<b>R0820</b>	763,562
Reinsurance payables	<b>R0830</b>	494,228
Payables (trade, not insurance)	<b>R0840</b>	407,265
Subordinated liabilities	<b>R0850</b>	1,617,143
Subordinated liabilities not in Basic Own Funds	<b>R0860</b>	
Subordinated liabilities in Basic Own Funds	<b>R0870</b>	1,617,143
Any other liabilities, not elsewhere shown	<b>R0880</b>	142,928
<b>Total liabilities</b>	<b>R0900</b>	<b>40,834,458</b>
<b>Excess of assets over liabilities</b>	<b>R1000</b>	<b>12,408,840</b>

S.12.01.02: Life and Health SLT Technical Provisions

TP Life, page 1

		Insurance with profit participation	Index-linked and unit-linked insurance	Contracts without options and guarantees	Contracts with options or guarantees
		C0020	C0030	C0040	C0050
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>				
<b>Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP calculated as a whole</b>	<b>R0020</b>				
<b>Technical provisions calculated as a sum of BE and RM</b>					
<b>Best Estimate</b>					
<b>Gross Best Estimate</b>	<b>R0030</b>				
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0080</b>				
Best estimate minus recoverables from reinsurance / SPV and Finite Re - total	<b>R0090</b>				
<b>Risk Margin</b>	<b>R0100</b>				
<b>Amount of the transitional on Technical Provisions</b>					
Technical Provisions calculated as a whole	<b>R0110</b>				
Best estimate	<b>R0120</b>				
Risk margin	<b>R0130</b>				
<b>Technical provisions - total</b>	<b>R0200</b>				

	Other life insurance		
	C0060	Contracts without options and guarantees C0070	Contracts with options or guarantees C0080
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>		
<b>Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP calculated as a whole</b>	<b>R0020</b>		
<b>Technical provisions calculated as a sum of BE and RM</b>			
<b>Best Estimate</b>			
<b>Gross Best Estimate</b>	<b>R0030</b>		
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0080</b>		
<b>Best estimate minus recoverables from reinsurance / SPV and Finite Re - total</b>	<b>R0090</b>		
<b>Risk Margin</b>	<b>R0100</b>		
<b>Amount of the transitional on Technical Provisions</b>			
Technical Provisions calculated as a whole	<b>R0110</b>		
Best estimate	<b>R0120</b>		
Risk margin	<b>R0130</b>		
<b>Technical provisions - total</b>	<b>R0200</b>		

		Annuities stemming from non-life insurance contracts and relating to insurance obligation other than health insurance obligations	Accepted reinsurance	Total (Life other than health insurance, incl. Unit-Linked)
		C0090	C0100	C0150
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>			
<b>Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP calculated as a whole</b>	<b>R0020</b>			
<b>Technical provisions calculated as a sum of BE and RM</b>				
<b>Best Estimate</b>				
<b>Gross Best Estimate</b>	<b>R0030</b>		4,373,414	4,373,414
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0080</b>		166,682	166,682
Best estimate minus recoverables from reinsurance / SPV and Finite Re - total	<b>R0090</b>		4,206,733	4,206,733
<b>Risk Margin</b>	<b>R0100</b>		1,517,038	1,517,038
<b>Amount of the transitional on Technical Provisions</b>				
Technical Provisions calculated as a whole	<b>R0110</b>			
Best estimate	<b>R0120</b>			
Risk margin	<b>R0130</b>			
<b>Technical provisions - total</b>	<b>R0200</b>		5,890,452	5,890,452

TP Life, page 4

	Health insurance (direct business)		
	C0160	Contracts without options and guarantees C0170	Contracts with options or guarantees C0180
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>		
<b>Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP calculated as a whole</b>	<b>R0020</b>		
<b>Technical provisions calculated as a sum of BE and RM</b>			
<b>Best Estimate</b>			
<b>Gross Best Estimate</b>	<b>R0030</b>		
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0080</b>		
Best estimate minus recoverables from reinsurance / SPV and Finite Re - total	<b>R0090</b>		
<b>Risk Margin</b>	<b>R0100</b>		
<b>Amount of the transitional on Technical Provisions</b>			
Technical Provisions calculated as a whole	<b>R0110</b>		
Best estimate	<b>R0120</b>		
Risk margin	<b>R0130</b>		
<b>Technical provisions - total</b>	<b>R0200</b>		

	Annuities stemming from non-life insurance contracts and relating to health insurance obligations	Health reinsurance (reinsurance accepted)	Total (Health similar to life insurance)
	C0190	C0200	C0210
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>		
<b>Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP calculated as a whole</b>	<b>R0020</b>		
<b>Technical provisions calculated as a sum of BE and RM</b>			
<b>Best Estimate</b>			
<b>Gross Best Estimate</b>	<b>R0030</b>	2,207,039	<b>2,207,039</b>
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0080</b>	417,081	<b>417,081</b>
Best estimate minus recoverables from reinsurance / SPV and Finite Re - total	<b>R0090</b>	1,789,959	<b>1,789,959</b>
<b>Risk Margin</b>	<b>R0100</b>	180,273	<b>180,273</b>
<b>Amount of the transitional on Technical Provisions</b>			
Technical Provisions calculated as a whole	<b>R0110</b>		
Best estimate	<b>R0120</b>		
Risk margin	<b>R0130</b>		
<b>Technical provisions - total</b>	<b>R0200</b>	<b>2,387,312</b>	<b>2,387,312</b>

S.17.01.02: Non-life Technical Provisions

S.17.01.02: TP Non-Life,  
page 1

		Direct business and accepted proportional reinsurance								
		Medical expense insurance <b>C0020</b>	Income protection insurance <b>C0030</b>	Workers' compensation insurance <b>C0040</b>	Motor vehicle liability insurance <b>C0050</b>	Other motor insurance <b>C0060</b>	Marine, aviation and transport insurance <b>C0070</b>	Fire and other damage to property insurance <b>C0080</b>	General liability insurance <b>C0090</b>	Credit and suretyship insurance <b>C0100</b>
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>									
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP as a whole	<b>R0050</b>									
<b>Technical provisions calculated as a sum of BE and RM</b>										
<b>Best estimate</b>										
<b>Premium provisions</b>										
Gross	<b>R0060</b>	1,400	61,477	15,614	156,412	140,332	79,209	778,955	316,806	223,911
Total recoverable from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0140</b>		12	3	326	257	7,563	46,629	1,846	49
Net Best Estimate of Premium Provisions	<b>R0150</b>	1,400	61,465	15,611	156,086	140,075	71,645	732,325	314,960	223,862
<b>Claims provisions</b>										
Gross	<b>R0160</b>	24,308	284,643	113,912	1,310,775	336,277	898,088	2,621,107	2,792,305	901,602
Total recoverable from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0240</b>		106	1,188	51,952	10,522	228,804	538,400	56,940	4,873
Net Best Estimate of Claims Provisions	<b>R0250</b>	24,308	284,536	112,723	1,258,823	325,755	669,283	2,082,707	2,735,365	896,729
<b>Total Best estimate - gross</b>	<b>R0260</b>	25,708	346,120	129,526	1,467,187	476,609	977,297	3,400,061	3,109,111	1,125,512
<b>Total Best estimate - net</b>	<b>R0270</b>	25,708	346,001	128,334	1,414,909	465,831	740,929	2,815,032	3,050,325	1,120,590
<b>Risk margin</b>	<b>R0280</b>	568	12,448	2,711	50,756	11,169	18,203	74,219	70,090	25,105

S.17.01.02: TP Non-Life,  
page 2

		Direct business and accepted proportional reinsurance								
		Medical expense insurance	Income protection insurance	Workers' compen- sation insurance	Motor vehicle liability insurance	Other motor insurance	Marine, aviation and transport insurance	Fire and other damage to property insurance	General liability insurance	Credit and suretyship insurance
		C0020	C0030	C0040	C0050	C0060	C0070	C0080	C0090	C0100
<b>Amount of the transitional on Technical Provisions</b>										
Technical Provisions calculated as a whole	<b>R0290</b>									
Best estimate	<b>R0300</b>									
Risk margin	<b>R0310</b>									
<b>Technical provisions - total</b>										
Technical provisions - total	<b>R0320</b>	26,276	358,568	132,236	1,517,944	487,778	995,499	3,474,280	3,179,201	1,150,618
Recoverable from reinsurance contract / SPV and Finite Re after the adjustment for expected losses due to counterparty default - total	<b>R0330</b>		119	1,191	52,278	10,779	236,368	585,029	58,785	4,922
Technical provisions minus recoverables from reinsurance / SPV and Finite Re - total	<b>R0340</b>	26,276	358,449	131,045	1,465,665	476,999	759,131	2,889,251	3,120,416	1,145,695

S.17.01.02: TP Non-Life,  
page 3

		Direct business and accepted proportional reinsurance			Accepted non-proportional reinsurance				Total Non-Life obligation
		Legal expenses insurance C0110	Assistance C0120	Miscellaneous financial loss C0130	Non-proportional health reinsurance C0140	Non-proportional casualty reinsurance C0150	Non-proportional marine, aviation and transport reinsurance C0160	Non-proportional property reinsurance C0170	
<b>Technical provisions calculated as a whole</b>	<b>R0010</b>								
Total Recoverables from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default associated to TP as a whole	<b>R0050</b>								
<b>Technical provisions calculated as a sum of BE and RM</b>									
<b>Best estimate</b>									
<b>Premium provisions</b>									
Gross	<b>R0060</b>	1,764	570	31,754	30,371	312,594	35,123	330,408	<b>2,516,699</b>
Total recoverable from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0140</b>			0	230	6,301	2,330	9,212	<b>74,758</b>
Net Best Estimate of Premium Provisions	<b>R0150</b>	1,764	570	31,754	30,141	306,293	32,793	321,196	<b>2,441,941</b>
<b>Claims provisions</b>									
Gross	<b>R0160</b>	12,355	868	121,161	1,201,093	6,344,957	922,810	3,212,194	<b>21,098,453</b>
Total recoverable from reinsurance / SPV and Finite Re after the adjustment for expected losses due to counterparty default	<b>R0240</b>			223	12,256	52,492	85,592	467,136	<b>1,510,485</b>
Net Best Estimate of Claims Provisions	<b>R0250</b>	12,355	868	120,938	1,188,837	6,292,465	837,219	2,745,058	<b>19,587,968</b>
<b>Total Best Estimate - gross</b>	<b>R0260</b>	14,118	1,438	152,915	1,231,463	6,657,551	957,933	3,542,602	<b>23,615,152</b>
<b>Total Best Estimate - net</b>	<b>R0270</b>	14,118	1,438	152,691	1,218,978	6,598,758	870,012	3,066,254	<b>22,029,908</b>
<b>Risk margin</b>	<b>R0280</b>	396	34	3,332	30,090	174,336	21,445	99,877	<b>594,779</b>

S.17.01.02: TP Non-Life,  
page 4

		Direct business and accepted proportional reinsurance			Accepted non-proportional reinsurance			Total Non-Life obligation	
		Legal expenses insurance C0110	Assistance C0120	Miscellaneous financial loss C0130	Non-proportional health reinsurance C0140	Non-proportional casualty reinsurance C0150	Non-proportional marine, aviation and transport reinsurance C0160		Non-proportional property reinsurance C0170
<b>Amount of the transitional on Technical Provisions</b>									
Technical Provisions calculated as a whole	<b>R0290</b>								
Best Estimate	<b>R0300</b>								
Risk margin	<b>R0310</b>								
<b>Technical provisions - total</b>									
Technical provisions - total	<b>R0320</b>	14,514	1,472	156,247	1,261,553	6,831,887	979,378	3,642,478	<b>24,209,930</b>
Recoverable from reinsurance contract / SPV and Finite Re after the adjustment for expected losses due to counterparty default - total	<b>R0330</b>			223	12,486	58,793	87,922	476,348	<b>1,585,243</b>
Technical provisions minus recoverables from reinsurance / SPV and Finite Re - total	<b>R0340</b>	14,514	1,472	156,023	1,249,068	6,773,094	891,457	3,166,131	<b>22,624,687</b>

**S.22.01.22: Impact of long term guarantees measures and transitionals**

S.22.01.22: Impact of long term guarantees measures and transitionals

		Amount with Long Term Guarantee measures and transitionals	Impact of transitional on technical provisions	Impact of transitional on interest rate	Impact of volatility adjustment set to zero	Impact of matching adjustment set to zero
		<b>C0010</b>	<b>C0030</b>	<b>C0050</b>	<b>C0070</b>	<b>C0090</b>
Technical provisions	<b>R0010</b>	32,487,695			519,659	
Basic own funds	<b>R0020</b>	12,634,559			-325,998	
Eligible own funds to meet Solvency Capital Requirement	<b>R0050</b>	12,634,559			-325,998	
<b>Solvency Capital Requirement</b>	<b>R0090</b>	<b>5,135,387</b>			<b>29,607</b>	

S.23.01.22: Own Funds

S.23.01.22: Own funds, page 1

		Total	Tier 1 - unrestricted	Tier 1 - restricted	Tier 2	Tier 3
		C0010	C0020	C0030	C0040	C0050
<b>Basic own funds before deduction for participations in other financial sector as foreseen in article 68 of Delegated Regulation (EU) 2015/35</b>						
Ordinary share capital (gross of own shares)	R0010	120,597	120,597			
Non-available called but not paid in ordinary share capital at group level	R0020					
Share premium account related to ordinary share capital	R0030	880,608	880,608			
Initial funds, members' contributions or the equivalent basic own - fund item for mutual and mutual-type undertakings	R0040					
Subordinated mutual member accounts	R0050					
Non-available subordinated mutual member accounts at group level	R0060					
Surplus funds	R0070					
Non-available surplus funds at group level	R0080					
Preference shares	R0090					
Non-available preference shares at group level	R0100					
Share premium account related to preference shares	R0110					
Non-available share premium account related to preference shares at group level	R0120					
Reconciliation reserve	R0130	10,639,839	10,639,839			
Subordinated liabilities	R0140	1,617,143		538,136	1,079,007	
Non-available subordinated liabilities at group level	R0150					
An amount equal to the value of net deferred tax assets	R0160	81,848				81,848
The amount equal to the value of net deferred tax assets not available at the group level	R0170					
Other own fund items approved by the supervisory authority as basic own funds not specified above	R0180					
Non available own funds related to other own funds items approved by supervisory authority	R0190					
Minority interests (if not reported as part of a specific own fund item)	R0200					
Non-available minority interests at group level	R0210	705,477	705,477			

S.23.01.22: Own funds, page 2

		Total	Tier 1 - unrestricted	Tier 1 - restricted	Tier 2	Tier 3
		C0010	C0020	C0030	C0040	C0050
<b>Own funds from the financial statements that should not be represented by the reconciliation reserve and do not meet the criteria to be classified as Solvency II own funds</b>						
Own funds from the financial statements that shall not be represented by the reconciliation reserve and do not meet the criteria to be classified as Solvency II own funds	<b>R0220</b>					
<b>Deductions</b>						
Deductions for participations in financial and credit institutions	<b>R0230</b>					
whereof deducted according to art 228 of the Directive 2009/138/EC	<b>R0240</b>					
Deductions for participations where there is non-availability of information (Article 229)	<b>R0250</b>					
Deduction for participations included by using D&A when a combination of methods is used	<b>R0260</b>					
Total of non-available own fund items	<b>R0270</b>	705,477	705,477			
<b>Total deductions</b>	<b>R0280</b>	<b>705,477</b>	<b>705,477</b>			
<b>Total basic own funds after deductions</b>	<b>R0290</b>	<b>12,634,559</b>	<b>10,935,567</b>	<b>538,136</b>	<b>1,079,007</b>	<b>81,848</b>
<b>Ancillary own funds</b>						
Unpaid and uncalled ordinary share capital callable on demand	<b>R0300</b>					
Unpaid and uncalled initial funds, members' contributions or the equivalent basic own fund item for mutual and mutual - type undertakings, callable on demand	<b>R0310</b>					
Unpaid and uncalled preference shares callable on demand	<b>R0320</b>					
A legally binding commitment to subscribe and pay for subordinated liabilities on demand	<b>R0330</b>					
Letters of credit and guarantees under Article 96(2) of the Directive 2009/138/EC	<b>R0340</b>					
Letters of credit and guarantees other than under Article 96(2) of the Directive 2009/138/EC	<b>R0350</b>					
Supplementary members calls under first subparagraph of Article 96(3) of the Directive 2009/138/EC	<b>R0360</b>					
Supplementary members calls - other than under first subparagraph of Article 96(3) of the Directive 2009/138/EC	<b>R0370</b>					
Non available ancillary own funds at group level	<b>R0380</b>					
Other ancillary own funds	<b>R0390</b>					
<b>Total ancillary own funds</b>	<b>R0400</b>					

S.23.01.22: Own funds, page 3

		Total	Tier 1 - unrestricted	Tier 1 - restricted	Tier 2	Tier 3
		C0010	C0020	C0030	C0040	C0050
<b>Own funds of other financial sectors</b>						
Credit Institutions, investment firms, financial institutions, alternative investment fund manager, financial institutions	R0410					
Institutions for occupational retirement provision	R0420					
Non regulated entities carrying out financial activities	R0430					
Total own funds of other financial sectors	R0440					
<b>Own funds when using the D&amp;A, exclusively or in combination of method 1</b>						
Own funds aggregated when using the D&A and combination of method	R0450					
Own funds aggregated when using the D&A and combination of method net of IGT	R0460					
Total available own funds to meet the consolidated group SCR (excluding own funds from other financial sector and from the undertakings included via D&A)	R0520	12,634,559	10,935,567	538,136	1,079,007	81,848
Total available own funds to meet the minimum consolidated group SCR	R0530	12,552,711	10,935,567	538,136	1,079,007	
Total eligible own funds to meet the consolidated group SCR (excluding own funds from other financial sector and from the undertakings included via D&A)	R0560	12,634,559	10,935,567	538,136	1,079,007	81,848
Total eligible own funds to meet the minimum consolidated group SCR	R0570	12,182,188	10,935,567	538,136	708,484	
<b>Minimum consolidated Group SCR</b>	R0610	3,542,422				
<b>Ratio of Eligible own funds to Minimum Consolidated Group SCR</b>	R0650	3.4389				
<b>Total eligible own funds to meet the group SCR (including own funds from other financial sector and from the undertakings included via D&amp;A)</b>	R0660	12,634,559	10,935,567	538,136	1,079,007	81,848
<b>Group SCR</b>	R0680	5,135,387				
<b>Ratio of Eligible own funds to group SCR including other financial sectors and the undertakings included via D&amp;A</b>	R0690	2.4603				

S.23.01.22: Own funds, page 4 / Reconciliation reserve

		<b>C0060</b>
<b>Reconciliation reserve</b>		
Excess of assets over liabilities	<b>R0700</b>	12,408,840
Own shares (held directly and indirectly)	<b>R0710</b>	
Foreseeable dividends, distributions and charges	<b>R0720</b>	685,948
Other basic own fund items	<b>R0730</b>	1,083,053
Adjustment for restricted own fund items in respect of matching adjustment portfolios and ring fenced funds	<b>R0740</b>	
Other non available own funds	<b>R0750</b>	
<b>Reconciliation reserve</b>	<b>R0760</b>	<b>10,639,839</b>
<b>Expected profits</b>		
Expected profits included in future premiums (EPIFP) - Life business	<b>R0770</b>	3,593,032
Expected profits included in future premiums (EPIFP) - Non- life business	<b>R0780</b>	1,281
<b>Total EPIFP</b>	<b>R0790</b>	<b>3,594,312</b>

**S.25.03.22: Solvency Capital Requirement – for Groups on Full Internal Models**

Unique number of component	Components description	Calculation of the Solvency Capital Requirement
<b>C0010</b>	<b>C0020</b>	<b>C0030</b>
101	Market risk according to IM	8,833,472
102	Counterparty default risk according to IM	312,553
103	Life underwriting risk according to IM	2,212,474
104	Non-life underwriting risk according to IM	3,819,254
105	Operational risk according to IM	575,329
107	LAC TP according to IM	
108	LAC DT according to IM	-1,969,648

Calculation of Solvency Capital Requirement		C0100
Total undiversified components	<b>R0110</b>	8,783,434
Diversification	<b>R0060</b>	-3,648,048
Capital requirement for business operated in accordance with Art. 4 of Directive 2003/41/EC	<b>R0160</b>	
<b>Solvency capital requirement excluding capital add-on</b>	<b>R0200</b>	<b>5,135,387</b>
Capital add-ons already set	<b>R0210</b>	
<b>Solvency capital requirement</b>	<b>R0220</b>	<b>5,135,387</b>
<b>Other information on SCR</b>		
Amount / estimate of the overall loss-absorbing capacity of technical provisions	<b>R0300</b>	
Amount / estimate of the overall loss-absorbing capacity of deferred taxes	<b>R0310</b>	-1,969,648
Total amount of Notional Solvency Capital Requirements for remaining part	<b>R0410</b>	
Total amount of Notional Solvency Capital Requirements for ring fenced funds	<b>R0420</b>	
Total amount of Notional Solvency Capital Requirement for matching adjustment portfolios	<b>R0430</b>	
Diversification effects due to RFF nSCR aggregation for article 304	<b>R0440</b>	
Minimum consolidated group solvency capital requirement	<b>R0470</b>	3,542,422
<b>Information on other entities</b>		
Capital requirement for other financial sectors (Non-insurance capital requirements)	<b>R0500</b>	
Capital requirement for other financial sectors (Non-insurance capital requirements) — Credit institutions, investment firms and financial institutions, alternative investment funds managers, UCITS management companies	<b>R0510</b>	
Capital requirement for other financial sectors (Non-insurance capital requirements) — Institutions for occupational retirement provisions	<b>R0520</b>	
Capital requirement for other financial sectors (Non-insurance capital requirements) — Capital requirement for non-regulated entities carrying out financial activities	<b>R0530</b>	
Capital requirement for non-controlled participation requirements	<b>R0540</b>	
Capital requirement for residual undertakings	<b>R0550</b>	

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