



SST 2017 Survey

FINMA Report on the Swiss Insurance Market

17 January 2018

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1 Introduction

This report¹ provides an overview of the 2017 SST results and is based on data collected from 143 insurers (16 life insurers, 20 health insurers, 53 general insurers and 54 reinsurers and reinsurance captives). It does not include insurance groups. The 24 reinsurance captives that became subject to the SST in 2016 for the first time are now included as part of the section for reinsurance.

The survey was carried out at peer-group level according to sector: life, health, general insurance and reinsurance. The survey shows breakdowns of various key indicators such as total assets or liabilities, or target capital.

As already for the SST Survey 2016, the scenario analysis only considers scenarios having an impact on the RBC. This avoids distortion for companies having no exposure to some scenarios. Note that scenarios are excluded from the analysis when less than five companies are concerned. Insurers may therefore have to evaluate scenarios, which are not included in their peer group.

Quality and completeness checks were carried out for each key indicator, resolving most of the errors and obvious deficiencies. In case figures from a company did not meet the quality and completeness requirements, the corresponding data has been excluded from the analysis. For instance, this would have been the case if the market risk diversification effect was positive. As a result, approximately 2% of the datasets (by number of companies) could not be used for the data plots. Unless otherwise stated, further corrections resulting from thorough FINMA reviews were not included in this report.

The “Fundamental Data Sheet” (FDS) was the data source for this survey. The FDS contains detailed quantitative information such as the decomposition of risk-bearing capital and target capital. All supervised insurers are requested to fill in the FDS and submit it to FINMA, regardless of whether they use a standard model or an internal model.

2 Solvency overview

Table 1 shows the number of insurers whose data were used in this survey (Considered) and the total number of insurers subject to SST reporting requirements (Participants).

	Considered	Participants
Life	16	16
Health	18	20
General insurance	52	53
Reinsurance	54	54
Total	140	143

Table 1: Number of companies considered in the current analysis and total number of insurers subject to SST reporting requirements.

This report is divided into four sections according to sector: life, health, general insurance and reinsurance. Table 2 shows the breakdown of the 143 insurers into sector and category². All

¹This version corrects a labelling error in some of the boxplots. All other information is unchanged.

²finma.ch > Supervision > Insurers > Categorisation

supervised insurers are assigned to categories 2 to 5; categories 1 and 6 are not relevant for insurers.

	Category 2	Category 3	Category 4	Category 5	Total
Life	2	10	4	0	16
Health	0	7	9	4	20
General insurance	2	9	16	26	53
Reinsurance	1	13	17	23	54
Total	5	39	46	53	143

Table 2: Breakdown of all insurers subject to SST reporting requirements according to sector and supervisory category.

The change with the biggest impact with respect to last year is due to the FINMA Circ. 2017/3 “SST”, Margin no. 62, where a new definition of SST ratio is provided. The new definition defines the solvency indicator as the ratio between risk-bearing capital (RBC) less the expected value of the discounted market value margin $\frac{MVM_1}{(1+r_{0,1})}$ (numerator) and the one-year risk capital (denominator). Note that the last term can be expressed as the difference between the target capital (TC) and the discounted market value margin. Based on the numbers of SST 2016, this methodological change resulted in an increase of the SST ratio by about 18% (resp. 10%) in absolute (resp. relative) terms.

The figures presented in Table 3 show the aggregated 2017 SST results of all the participants. It is important to note that the 2016 numbers for reinsurances are restated in order to include reinsurance captives.

	RBC	TC	SST ratio
Life	64,519	43,913	160%
Health	9,701	4,002	251%
General insurance	75,800	38,387	225%
Reinsurance	60,157	29,659	223%
Total	210,177	115,961	202%

Table 3: Risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2017, broken down by sector.

	RBC	TC	SST ratio
Life	59,645	40,903	146%
Health	9,493	3,704	256%
General insurance	74,759	40,995	182%
Reinsurance	60,267	29,745	203%
Total	204,164	115,347	177%

Table 4: Risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2016, broken down by sector.

The 2016 and 2017 SST figures, including FINMA’s corrections, are restated in Tables 6 and 5. Any changes result from FINMA’s corrections and from delayed or updated data delivery.

	RBC	TC	SST ratio
Life	64,519	43,913	160%
Health	9,672	4,002	250%
General insurance	75,800	38,387	225%
Reinsurance	60,157	29,659	223%
Total	210,149	115,961	202%

Table 5: Restated risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2017, broken down by sector (including FINMA's corrections).

	RBC	TC	SST ratio
Life	59,645	41,019	145%
Health	9,493	3,704	256%
General insurance	74,756	41,003	182%
Reinsurance	56,869	28,317	201%
Total	200,763	114,043	176%

Table 6: Restated risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2016, broken down by sector (including FINMA's corrections).

3 Life

3.1 Goals of the analyses

The analyses presented in this section give a deeper insight into:

- investment structure;
- liability structure;
- best estimate of liabilities and target capital in relation to the total assets;
- split of target capital into its components, e.g. market, credit and insurance risk;
- split of market risk into interest rate risk, equity risk, etc.;
- split of interest rate risk into different currencies;
- scenarios and their impact on risk-bearing capital; indication of whether the SST capital requirements after scenario impacts are still met.

Two types of graph are shown:

- waterfall diagrams;
- box plots providing information on data dispersion.

To avoid conclusions that can be drawn about an insurer's individual risk profile, the data are pooled by insurance sector. The graphs illustrate a breakdown of the indicators into their components. Any component based on less than five insurers is not included in the graph.

Assets

The total assets in the market-consistent balance sheet are shown as the sum of the different asset types (e.g. bonds, real estate, shares, etc.).

Liabilities

The total liabilities in the market-consistent balance sheet are split according to liability type.

Best estimate of liabilities and target capital in relation to the balance sheet total

The market value of assets ($MV(A)$) is decomposed into:

- best estimate of liabilities (BEL);
- market value margin (MVM);
- one-year capital requirement (SCR), which is computed as the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are linked through

$$TC = SCR + MVM \quad (1)$$

- excess capital (EC), which is defined as the difference between the risk-bearing capital (RBC) and the target capital (TC), which gives

$$RBC = TC + EC \quad (2)$$

- supplementary capital (SC);
- deductions (D).

More precisely:

$$MV(A) = BEL + MVM + SCR + EC - SC + D.$$

To show this, note that the core capital (CC) and the risk-bearing capital (RBC) are related through

$$RBC = CC + SC. \quad (3)$$

For the purpose of this analysis, the temporary adjustment term, where relevant, has been included in the supplementary capital. CC can now be expressed as:

$$CC = MV(A) - BEL - D,$$

from which the following relation is derived by means of (3):

$$MV(A) = BEL + RBC - SC + D.$$

By means of (1) and (2) we conclude that

$$\begin{aligned} MV(A) &= BEL + EC + TC - SC + D \\ &= BEL + MVM + SCR + EC - SC + D. \end{aligned}$$

Target capital decomposition

Target capital is the sum of the one-year capital requirement (SCR) and the market value margin (MVM). In turn, the SCR key components are market risk, credit risk, insurance risk and effect of the scenarios and diversification.

Market risk analysis

Market risk plays a dominant role in an economic, risk-based solvency regime. A number of risk factors, such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to market risk. Waterfall and box plot diagrams are used to present the most important market risk factors.

Interest rate risk analysis

Insurers with assets and liabilities denominated in different currencies are exposed to currency risk and generally also to interest rate risk. In such cases, the total interest rate risk comprises the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into four currencies CHF, EUR, USD and GBP, including the effect of diversification.

Scenarios

For each scenario, we computed the impact ratio, which is defined as the sum of risk-bearing capital (RBC) and the scenario impact (c), divided by the RBC:

$$\text{Impact ratio} = \frac{\text{RBC} + c}{\text{RBC}}.$$

Typically, a scenario impact c with a negative value represents a loss. To concentrate only on relevant scenarios, scenarios with no impact (i.e. $c = 0$) are ignored.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario is the *excess capital* (EC), i.e. $c = -\text{EC}$. This loss is understood as the maximum loss an insurer can endure and still remain solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). To obtain the corresponding impact ratio, we used relation (2), i.e. $\text{RBC} = \text{TC} + \text{EC}$;

$$\text{Impact ratio} = \frac{\text{RBC} - \text{EC}}{\text{RBC}} = \frac{\text{TC}}{\text{RBC}}.$$

To facilitate the comparison of general scenarios with this reference scenario, the latter is illustrated in a different colour.

Scenarios exempted from the target capital aggregation are labelled (naS) for “non-aggregated Scenarios”.

3.2 Comments on results

The overall SST ratio is 160%. The risk bearing capital increased by 8.2% to CHF 64,519 million, while target capital went up by 7.1% to CHF 43,913 million. The new definition of the SST ratio led to an absolute improvement of about 13%, based on the SST 2016 numbers.

Capital requirements are largely influenced by market risks (56% of target capital), which are dominated by interest rates and spread risks.

3.3 Assets

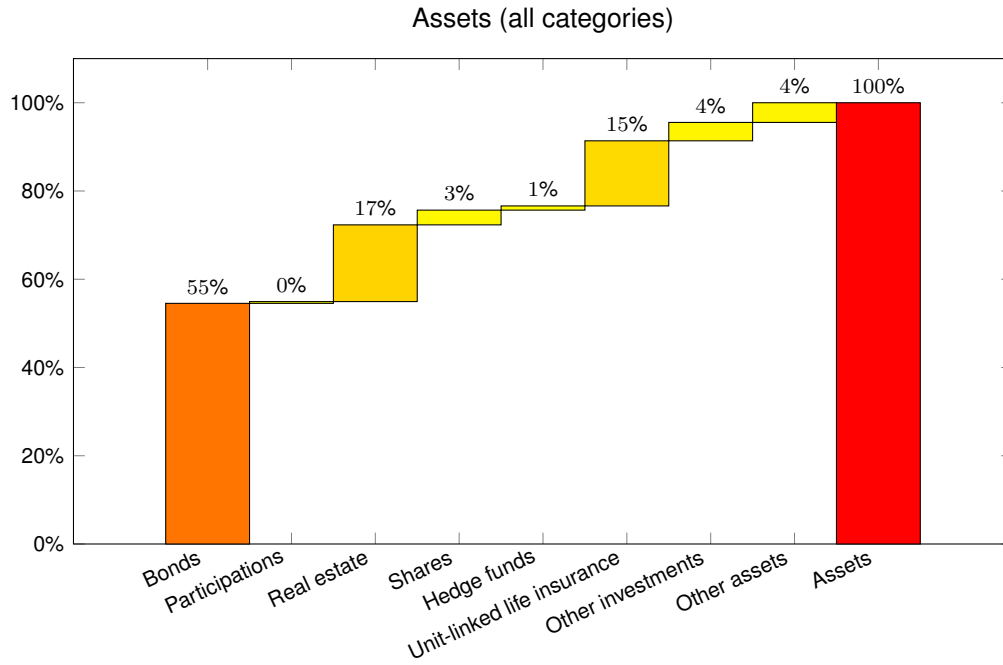


Figure 1a: Life (mean values by sector)

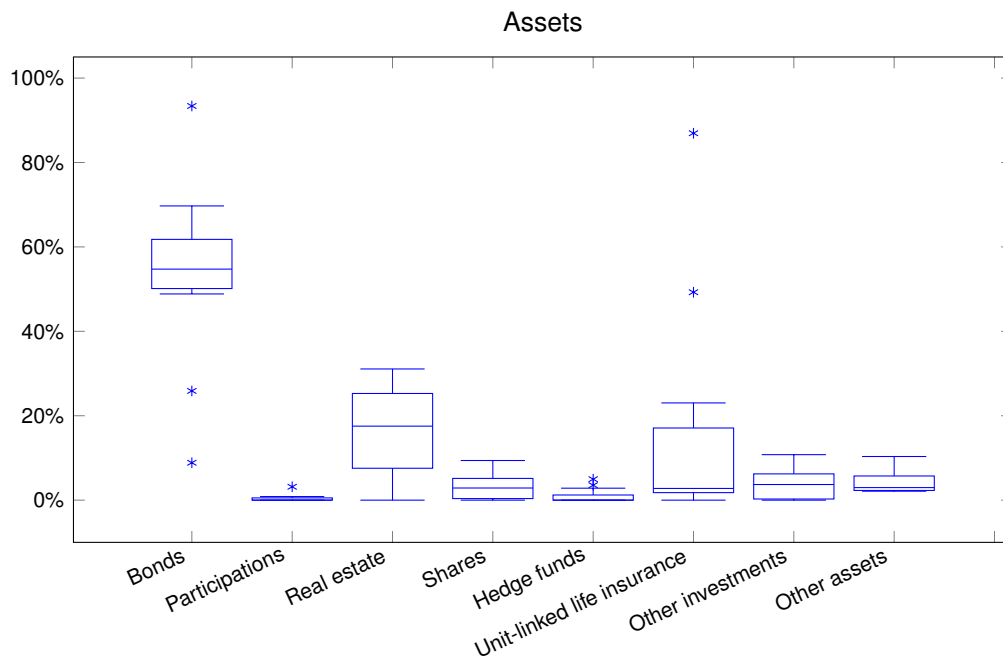


Figure 1b: Life (distribution as box-plot)

3.4 Liabilities

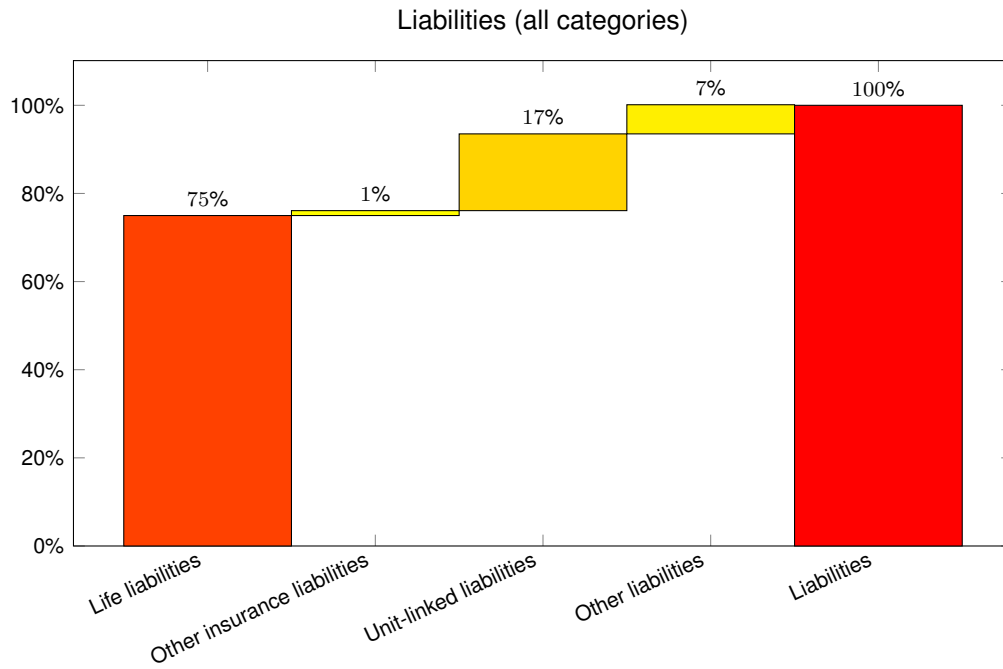


Figure 2a: Life (mean values by sector)

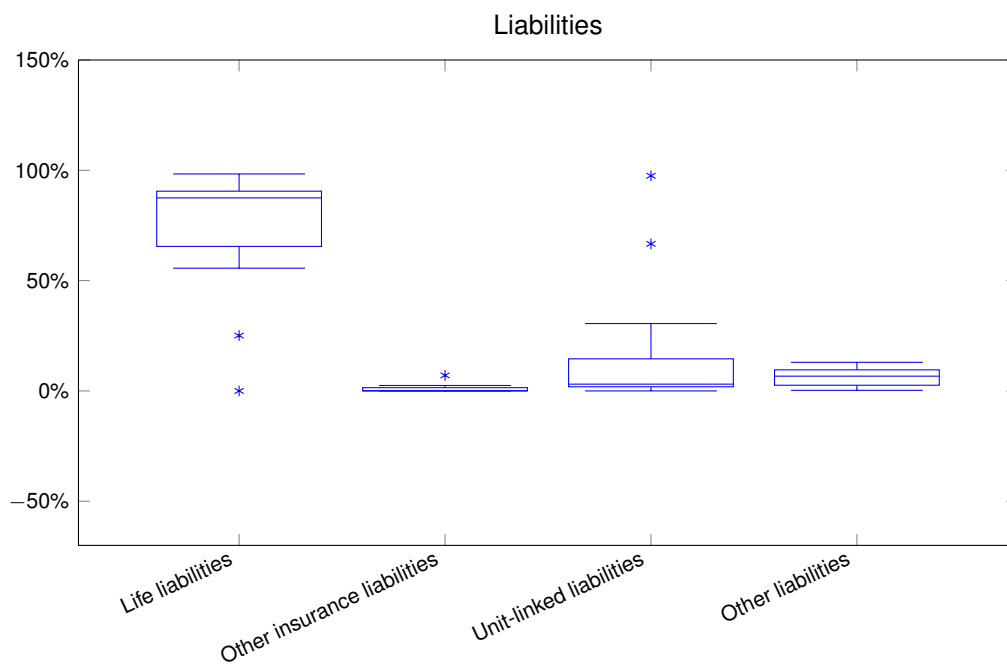


Figure 2b: Life (distribution as box-plot)

3.5 Interest rate analysis

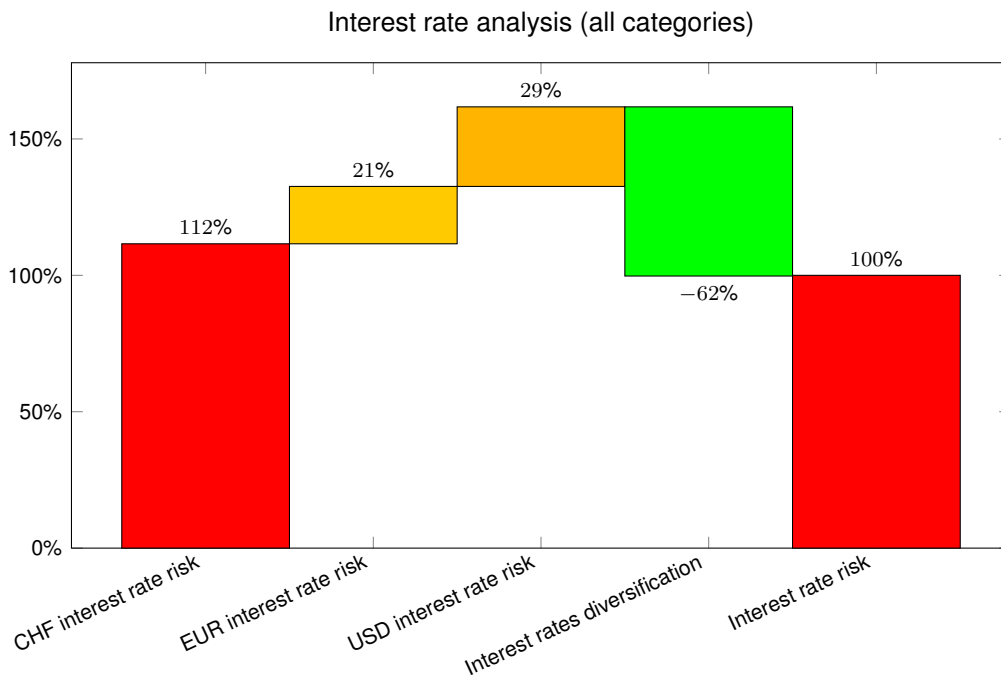


Figure 3a: Life (mean values by sector)

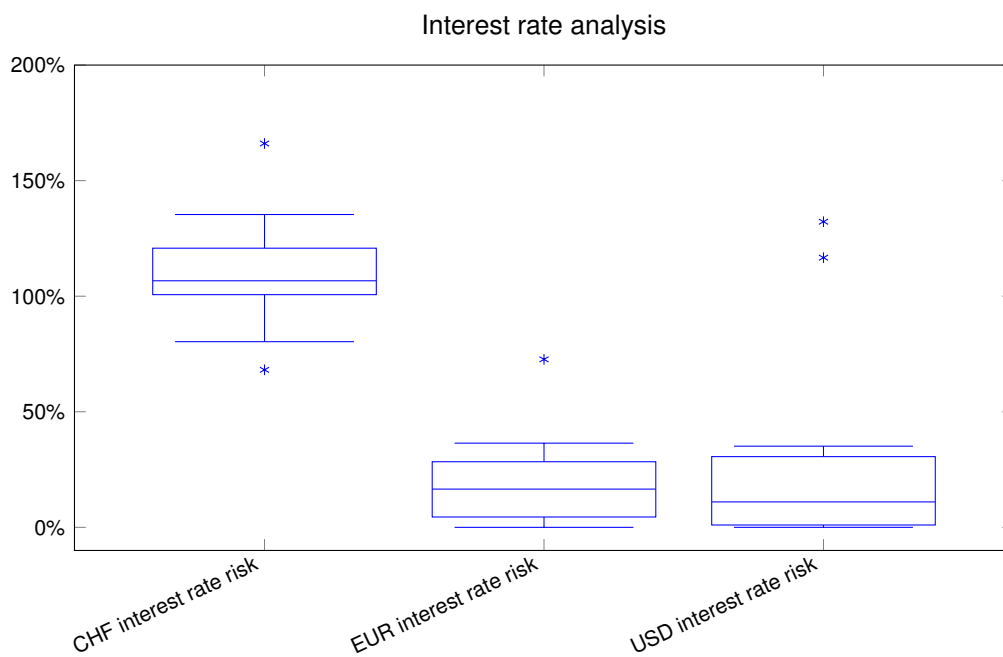


Figure 3b: Life (distribution as box-plot)

3.6 Best estimate of liability and target capital in relation to the balance sheet total

Best estimate of liability and target capital in relation to the balance sheet total (all categories)

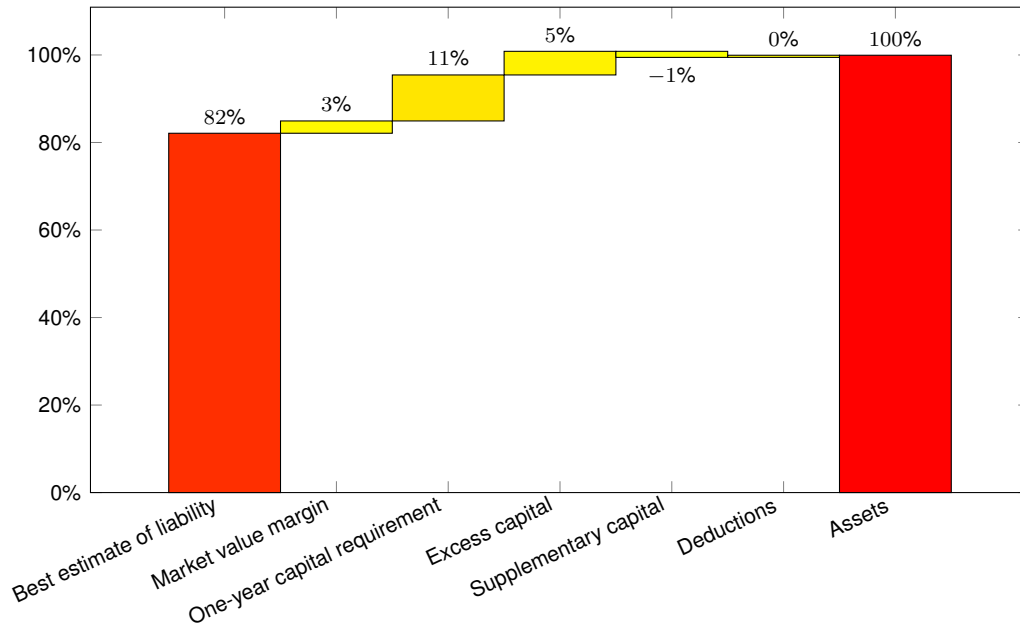


Figure 4a: Life (mean values by sector)

Best estimate of liability and target capital in relation to the balance sheet total

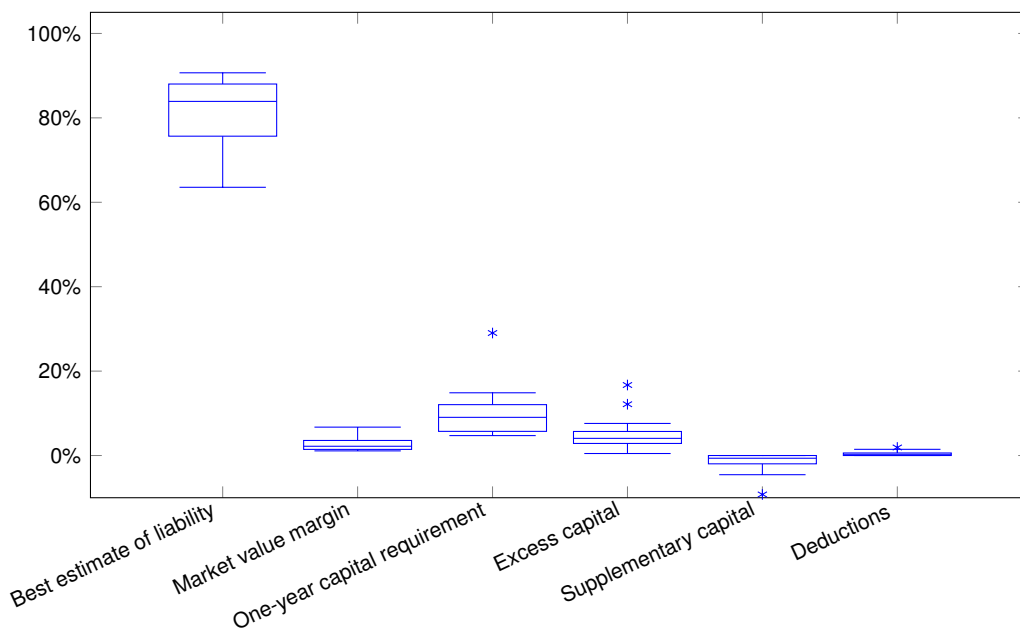


Figure 4b: Life (distribution as box-plot)

3.7 Target capital decomposition

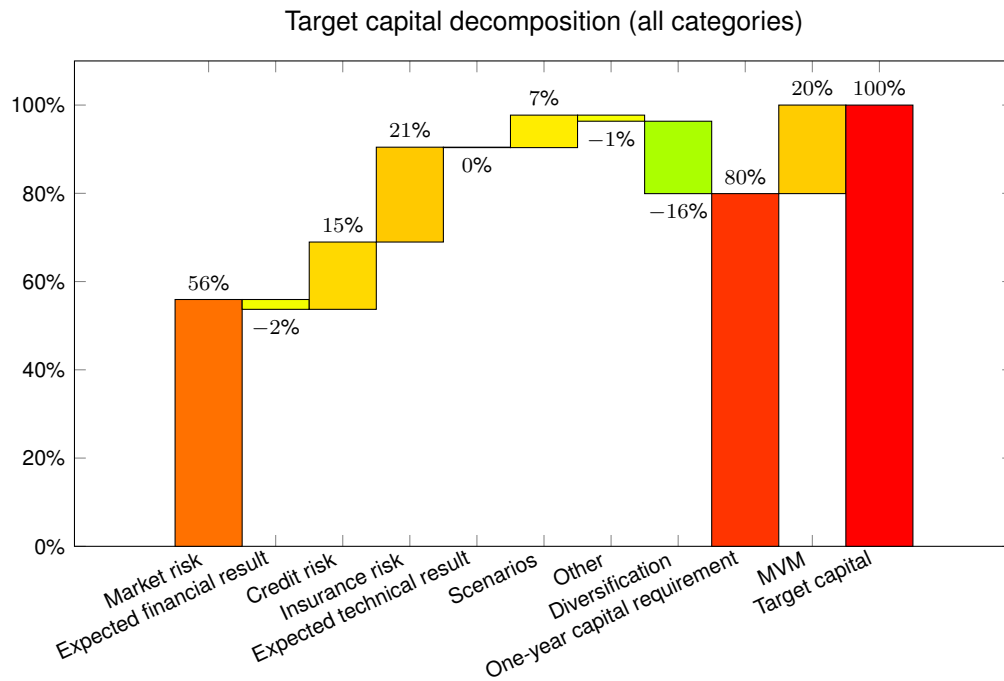


Figure 5a: Life (mean values by sector)

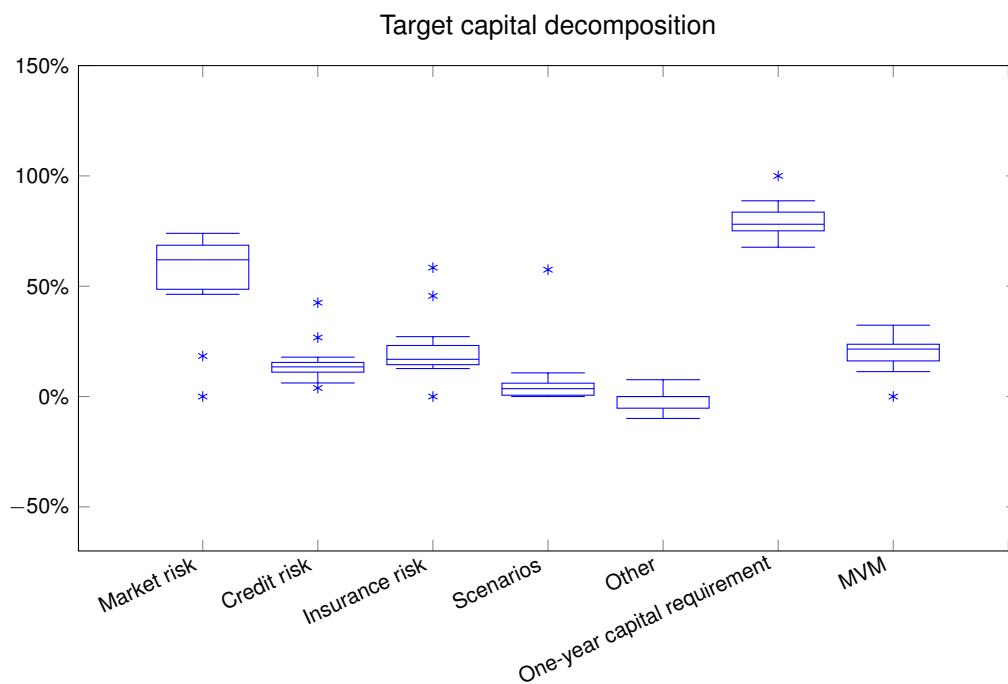


Figure 5b: Life (distribution as box-plot)

3.8 Market risk analysis

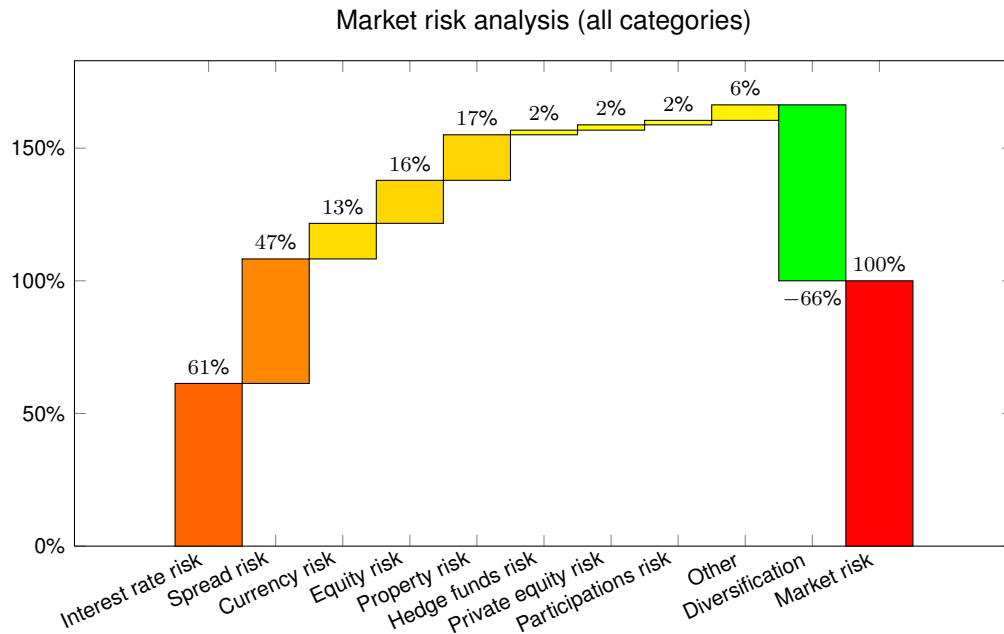


Figure 6a: Life (mean values by sector)

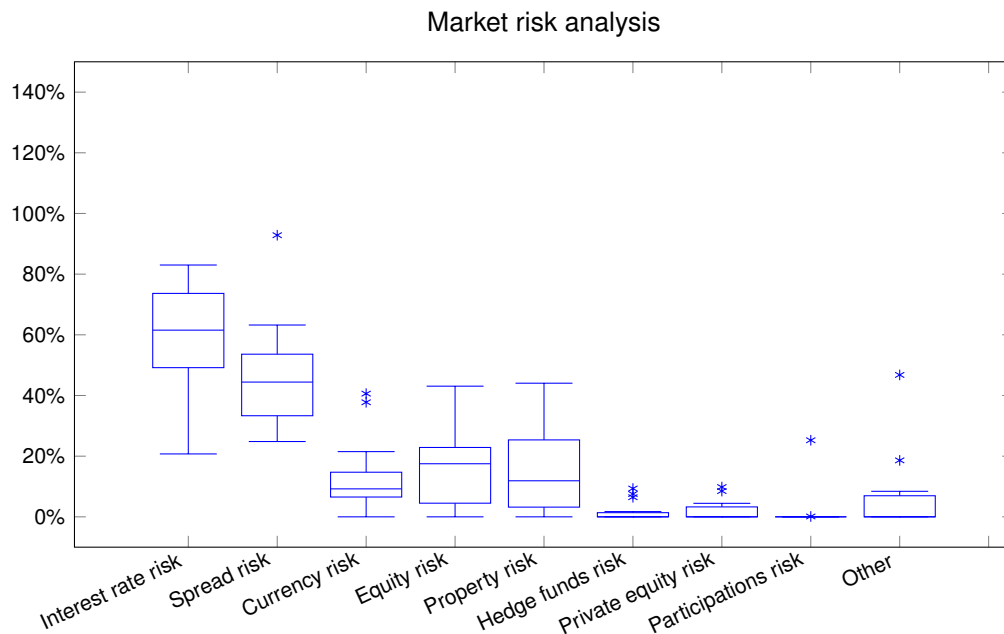


Figure 6b: Life (distribution as box-plot)

3.9 Market and credit risk scenarios

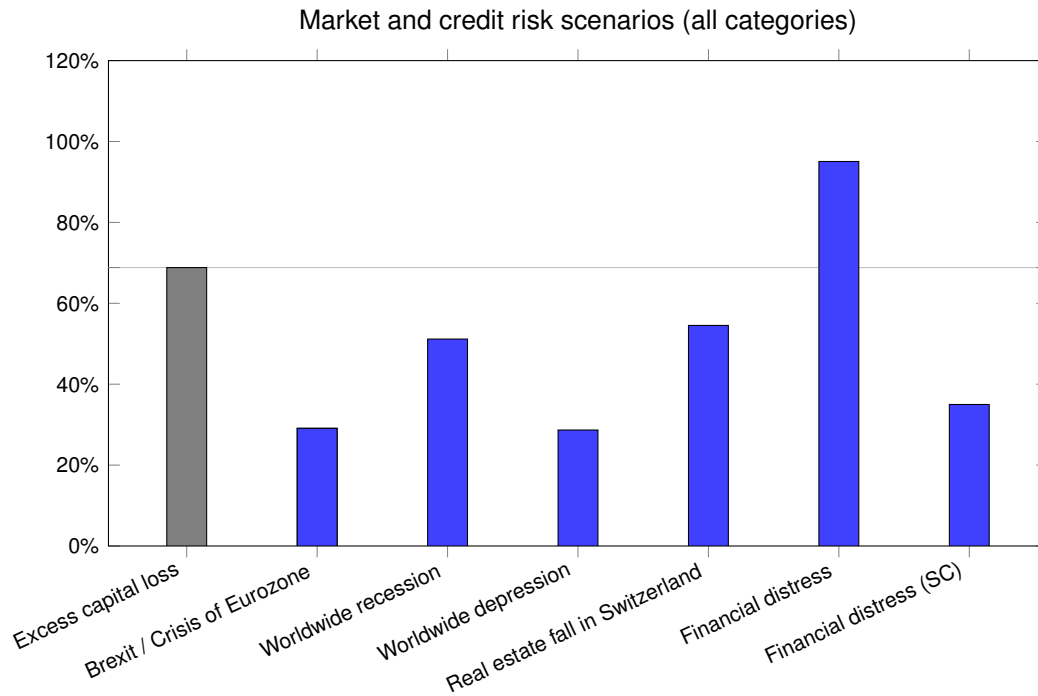


Figure 7a: Life (mean values by sector)

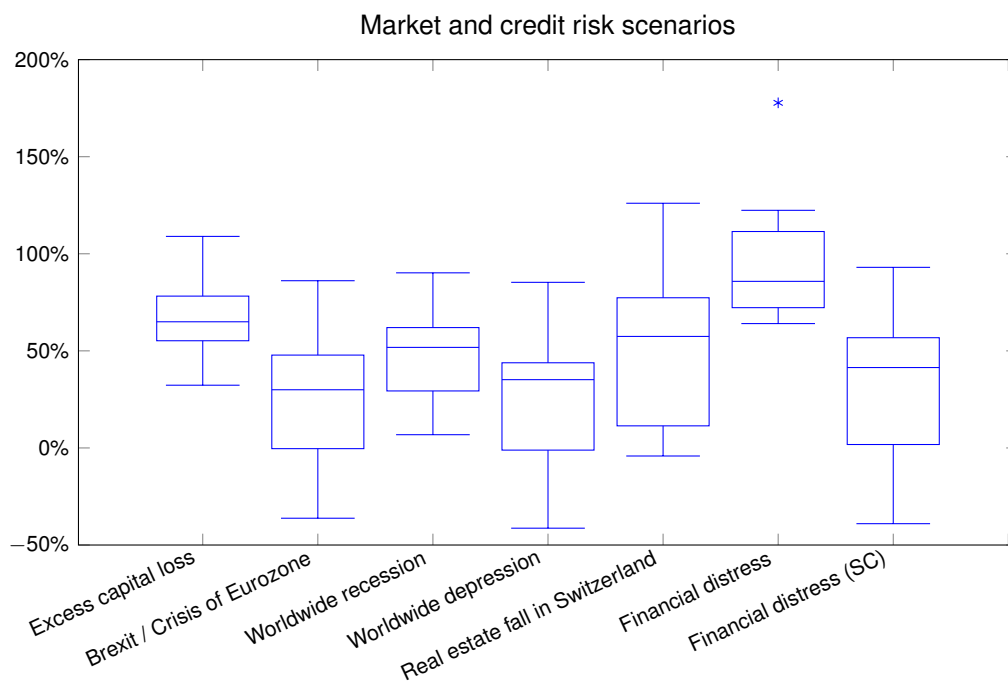


Figure 7b: Life (distribution as box-plot)

3.10 Insurance risk and global scenarios

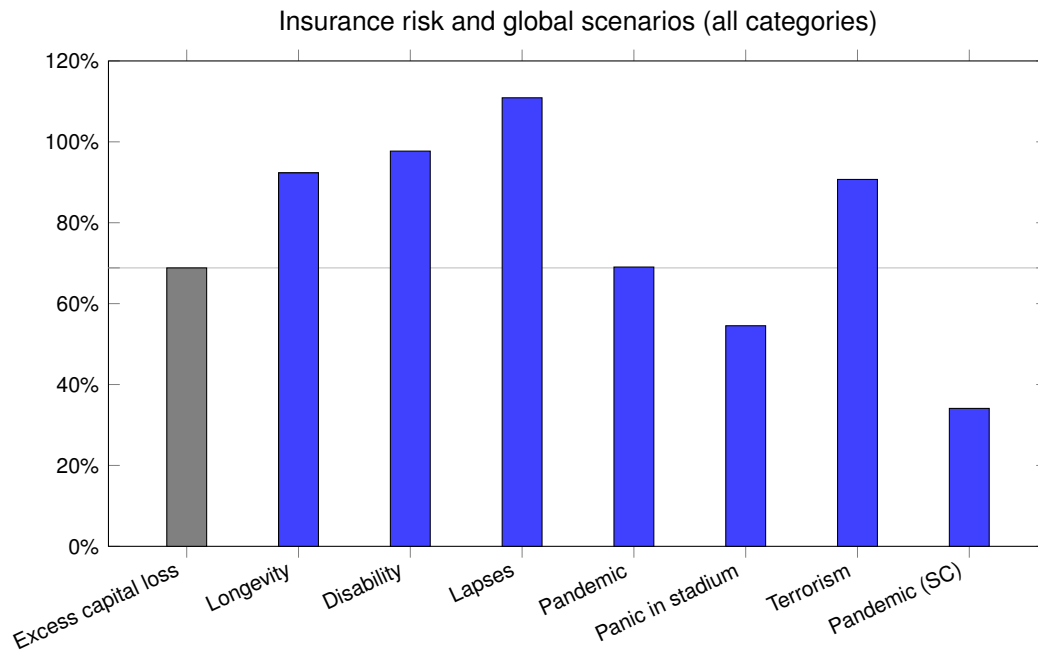


Figure 8a: Life (mean values by sector)

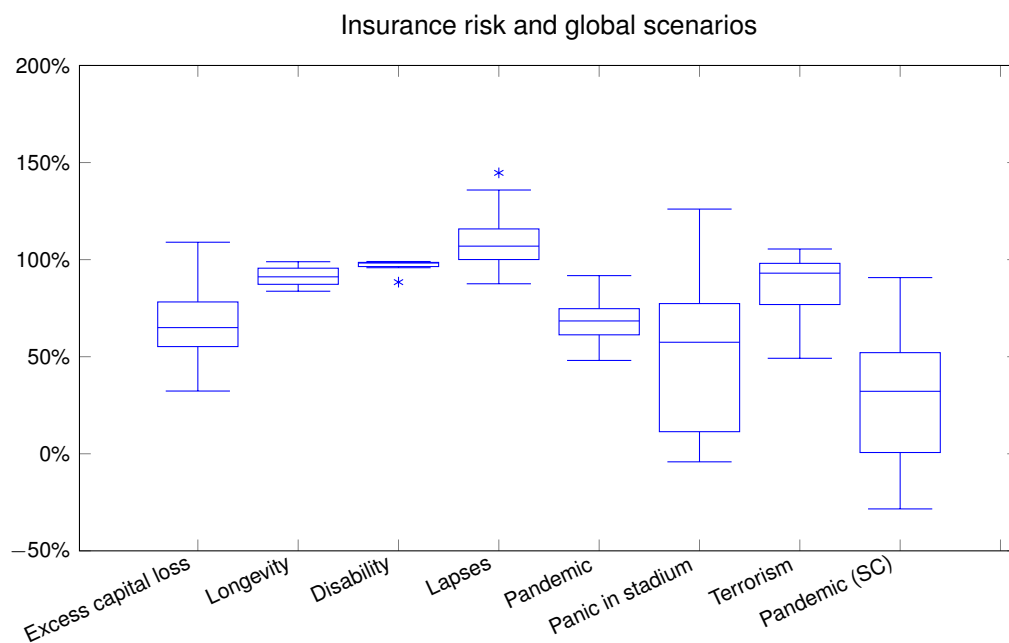


Figure 8b: Life (distribution as box-plot)

4 General insurance

4.1 Goals of the analyses

The analyses presented in this section give a deeper insight into:

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- liability structure;
- best estimate of liabilities and target capital in relation to the total assets;
- split of target capital into its components, e.g. market, credit and insurance risk;
- split of market risk into interest rate risk, equity risk, etc.;
- split of interest rate risk into different currencies;
- scenarios and their impact on risk-bearing capital; indication of whether the SST capital requirements after scenario impacts are still met.

Two types of graph are shown:

- waterfall diagrams;
- box plots providing information on data dispersion.

To avoid conclusions that can be drawn about an insurer's individual risk profile, the data are pooled by insurance sector. The graphs illustrate a breakdown of the indicators into their components. Any component based on less than five insurers is not included in the graph.

Assets

The total assets in the market-consistent balance sheet are shown as the sum of the different asset types (e.g. bonds, real estate, shares, etc.).

Liabilities

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Best estimate of liabilities and target capital in relation to the balance sheet total

The market value of assets ($MV(A)$) is decomposed into:

- best estimate of liabilities (BEL);
- market value margin (MVM);
- one-year capital requirement (SCR), which is computed as the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are linked through

$$TC = SCR + MVM \quad (1)$$

- excess capital (EC), which is defined as the difference between the risk-bearing capital (RBC) and the target capital (TC), which gives

$$\text{RBC} = \text{TC} + \text{EC} \quad (2)$$

- supplementary capital (SC);
- deductions (D).

More precisely:

$$\text{MV(A)} = \text{BEL} + \text{MVM} + \text{SCR} + \text{EC} - \text{SC} + \text{D}.$$

To show this, note that the core capital (CC) and the risk-bearing capital (RBC) are related through

$$\text{RBC} = \text{CC} + \text{SC}. \quad (3)$$

For the purpose of this analysis, the temporary adjustment term, where relevant, has been included in the supplementary capital. CC can now be expressed as:

$$\text{CC} = \text{MV(A)} - \text{BEL} - \text{D},$$

from which the following relation is derived by means of (3):

$$\text{MV(A)} = \text{BEL} + \text{RBC} - \text{SC} + \text{D}.$$

By means of (1) and (2) we conclude that

$$\begin{aligned} \text{MV(A)} &= \text{BEL} + \text{EC} + \text{TC} - \text{SC} + \text{D} \\ &= \text{BEL} + \text{MVM} + \text{SCR} + \text{EC} - \text{SC} + \text{D}. \end{aligned}$$

Target capital decomposition

Target capital is the sum of the one-year capital requirement (SCR) and the market value margin (MVM). In turn, the SCR key components are market risk, credit risk, insurance risk and effect of the scenarios and diversification.

Market risk analysis

Market risk plays a dominant role in an economic, risk-based solvency regime. A number of risk factors, such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to market risk. Waterfall and box plot diagrams are used to present the most important market risk factors.

Interest rate risk analysis

Insurers with assets and liabilities denominated in different currencies are exposed to currency risk and generally also to interest rate risk. In such cases, the total interest rate risk comprises the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into four currencies CHF, EUR, USD and GBP, including the effect of diversification.

Scenarios

For each scenario, we computed the impact ratio, which is defined as the sum of risk-bearing capital (RBC) and the scenario impact (c), divided by the RBC:

$$\text{Impact ratio} = \frac{\text{RBC} + c}{\text{RBC}}.$$

Typically, a scenario impact c with a negative value represents a loss. To concentrate only on relevant scenarios, scenarios with no impact (i.e. $c = 0$) are ignored.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario is the *excess capital* (EC), i.e. $c = -\text{EC}$. This loss is understood as the maximum loss an insurer can endure and still remain solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). To obtain the corresponding impact ratio, we used relation (2), i.e. $\text{RBC} = \text{TC} + \text{EC}$;

$$\text{Impact ratio} = \frac{\text{RBC} - \text{EC}}{\text{RBC}} = \frac{\text{TC}}{\text{RBC}}.$$

To facilitate the comparison of general scenarios with this reference scenario, the latter is illustrated in a different colour.

Scenarios exempted from the target capital aggregation are labelled (naS) for “non-aggregated Scenarios”.

4.2 Comments on results

The overall SST ratio is 225%. The risk bearing capital increased slightly by 1.4% to CHF 75,800 million. The target capital decreased by 6.4% to CHF 38,387 million. The new definition of the SST ratio led to an absolute improvement of about 20%, based on the SST 2016 numbers.

Regarding the target capital decomposition the main risk driver was the insurance risk followed by the market risk.

4.3 Assets

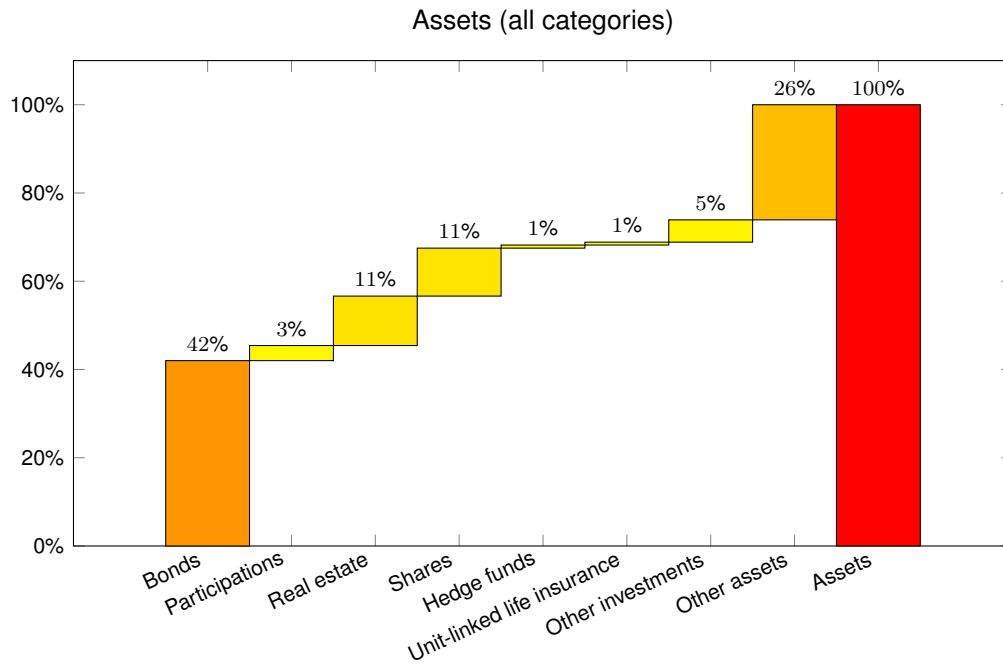


Figure 9a: General insurance (mean values by sector)

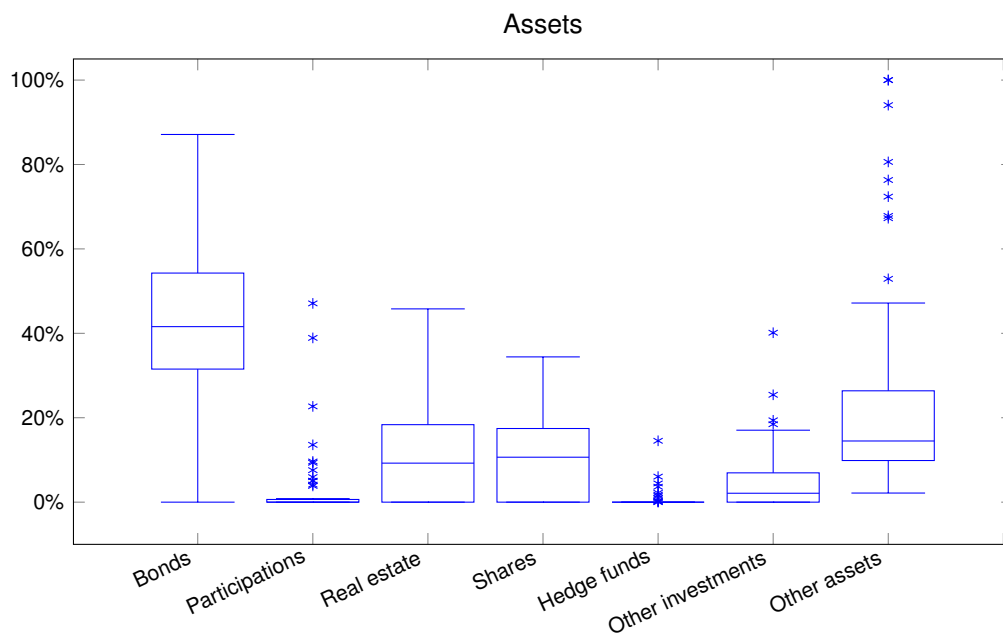


Figure 9b: General insurance (distribution as box-plot)

4.4 Liabilities

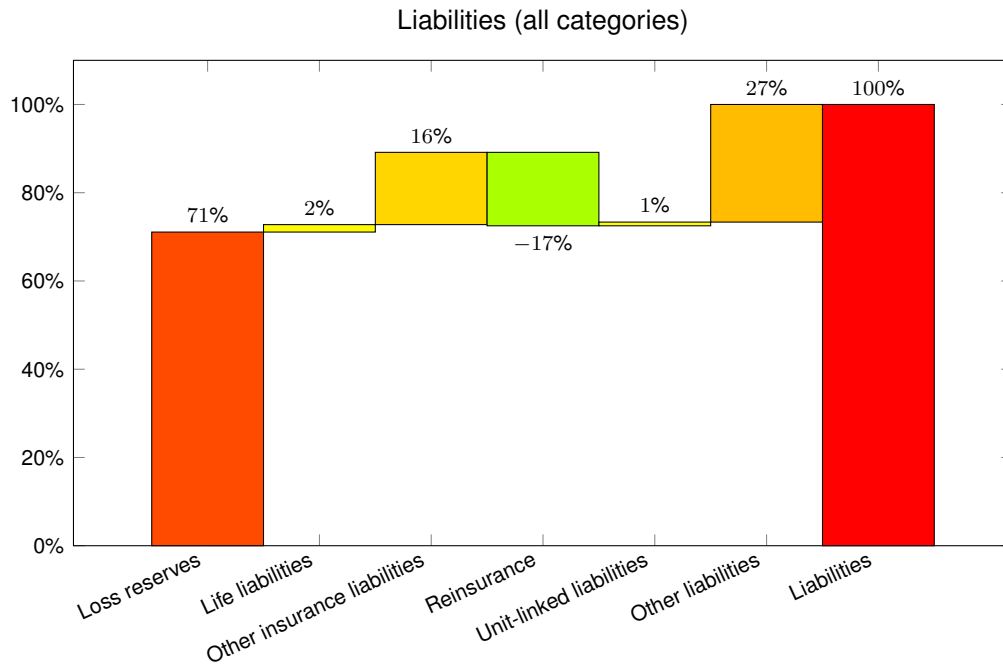


Figure 10a: General insurance (mean values by sector)

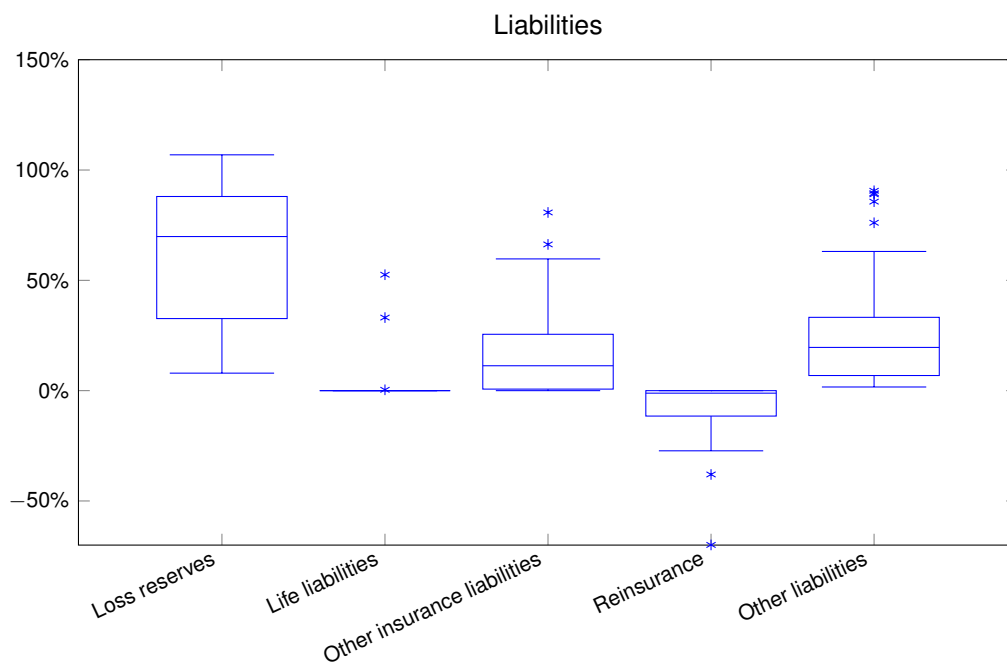


Figure 10b: General insurance (distribution as box-plot)

4.5 Best estimate of liability and target capital in relation to the balance sheet total

Best estimate of liability and target capital in relation to the balance sheet total (all categories)

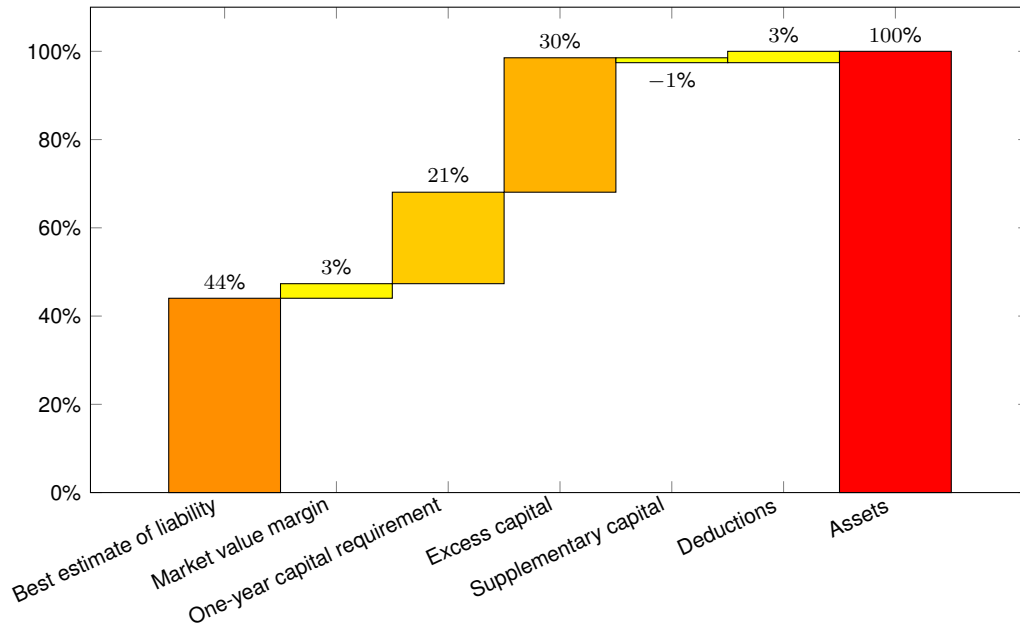


Figure 11a: General insurance (mean values by sector)

Best estimate of liability and target capital in relation to the balance sheet total

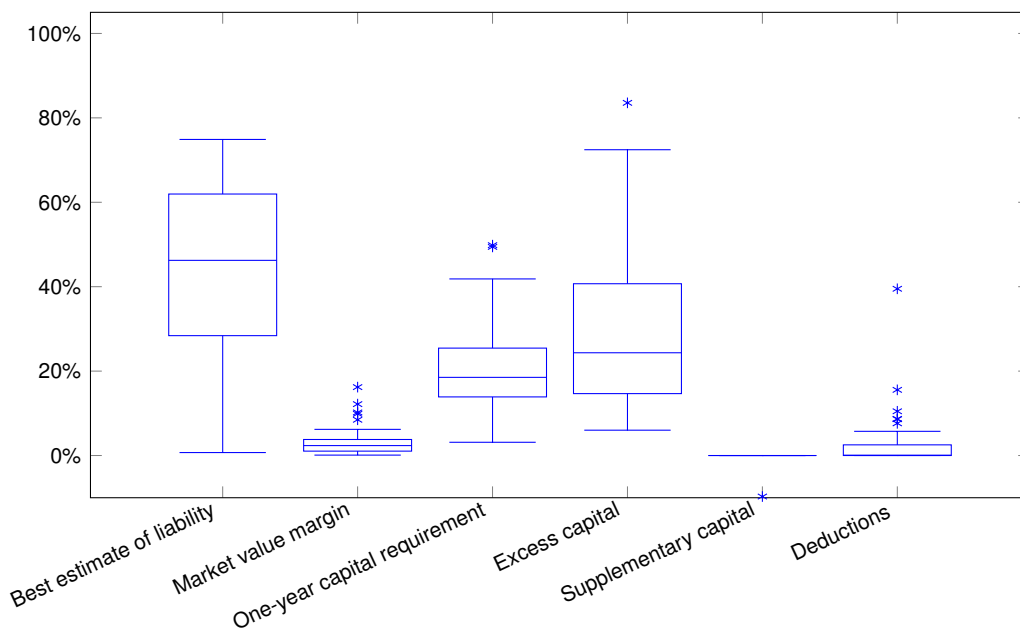


Figure 11b: General insurance (distribution as box-plot)

4.6 Target capital decomposition

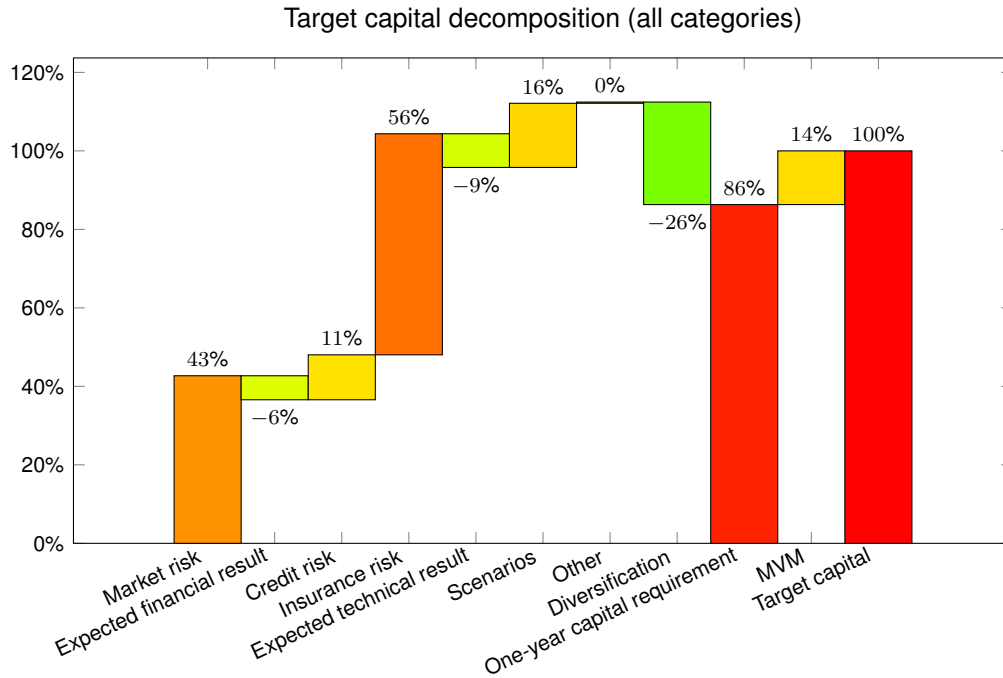


Figure 12a: General insurance (mean values by sector)

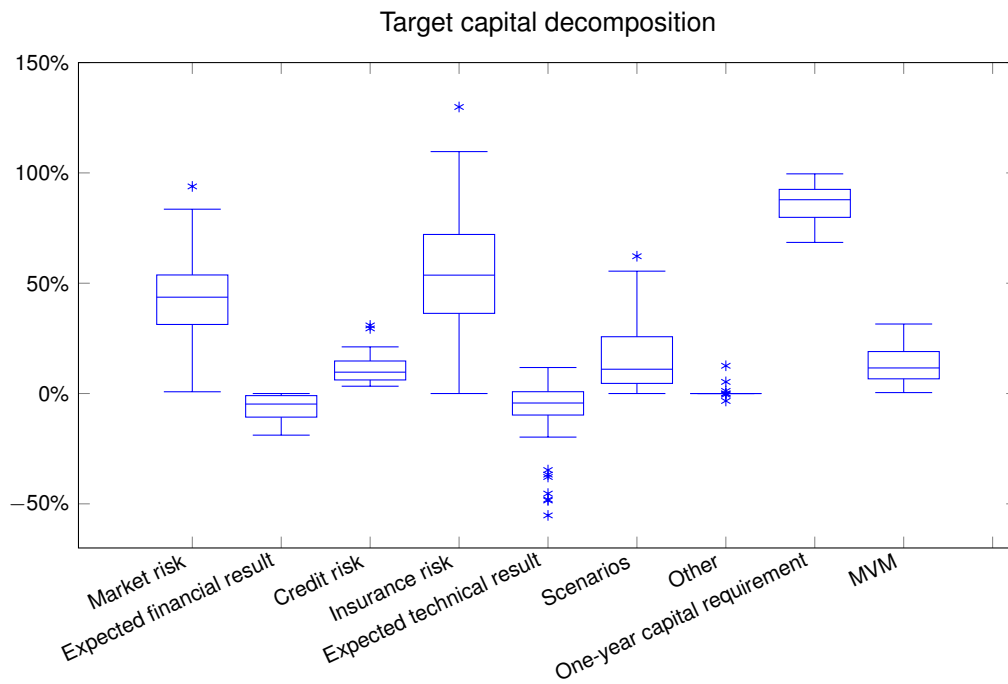


Figure 12b: General insurance (distribution as box-plot)

4.7 Market risk analysis

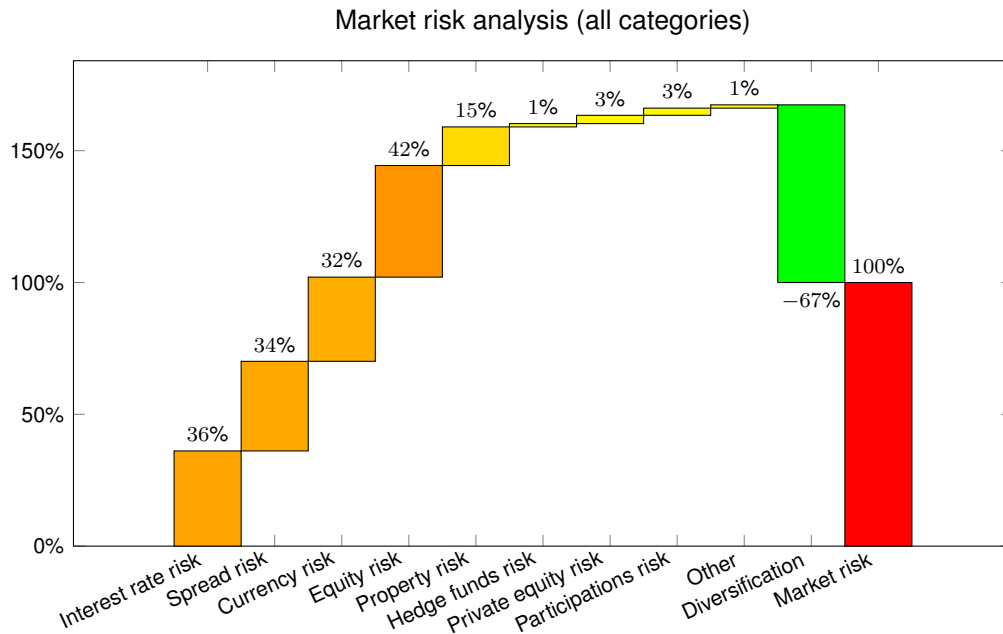


Figure 13a: General insurance (mean values by sector)

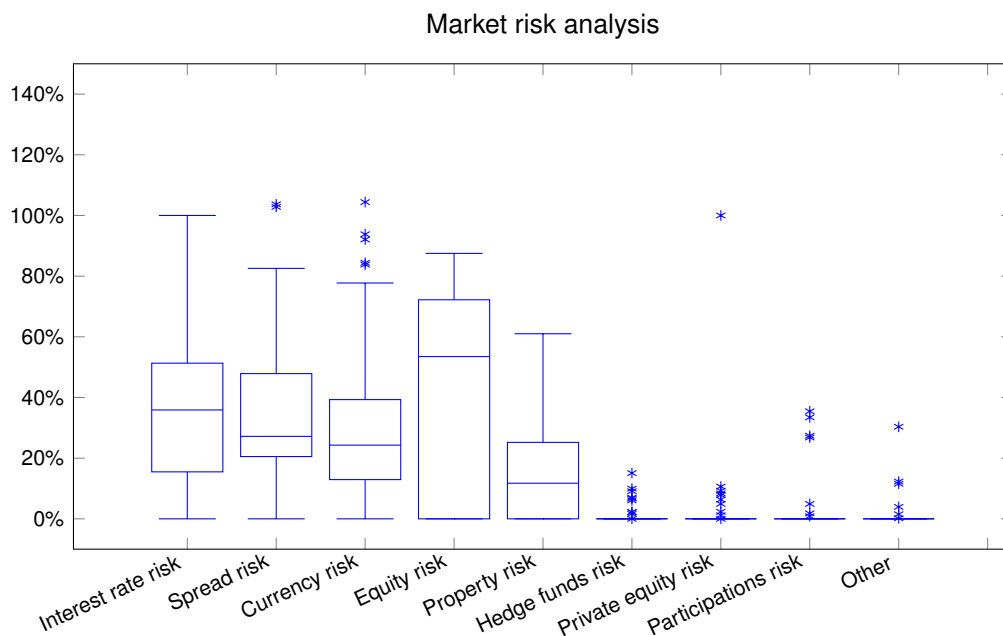


Figure 13b: General insurance (distribution as box-plot)

4.8 Interest rate analysis

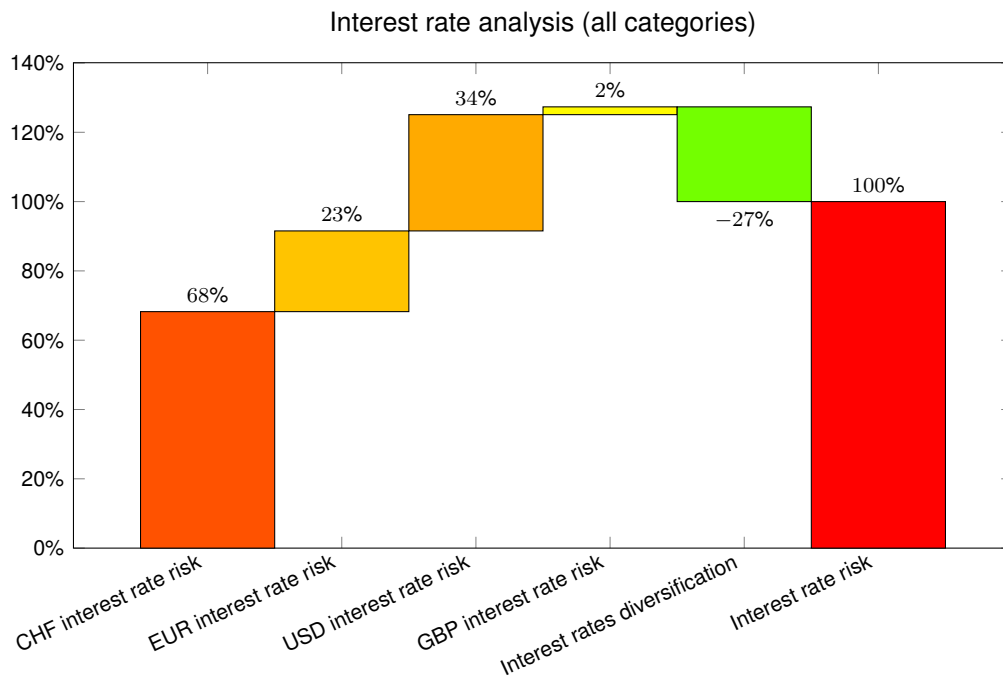


Figure 14a: General insurance (mean values by sector)

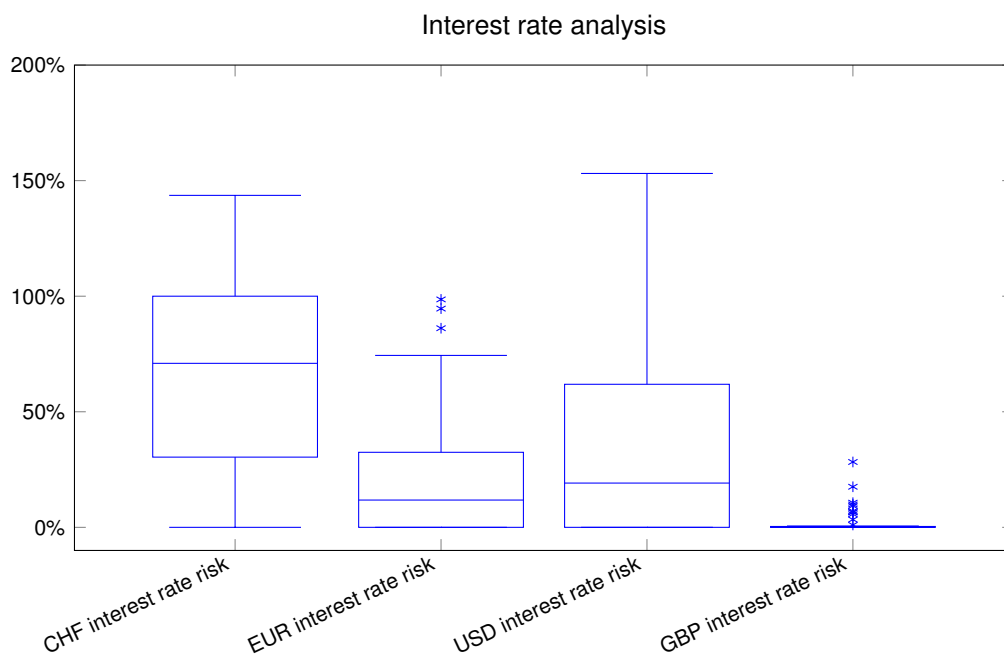


Figure 14b: General insurance (distribution as box-plot)

4.9 General insurance risk analysis

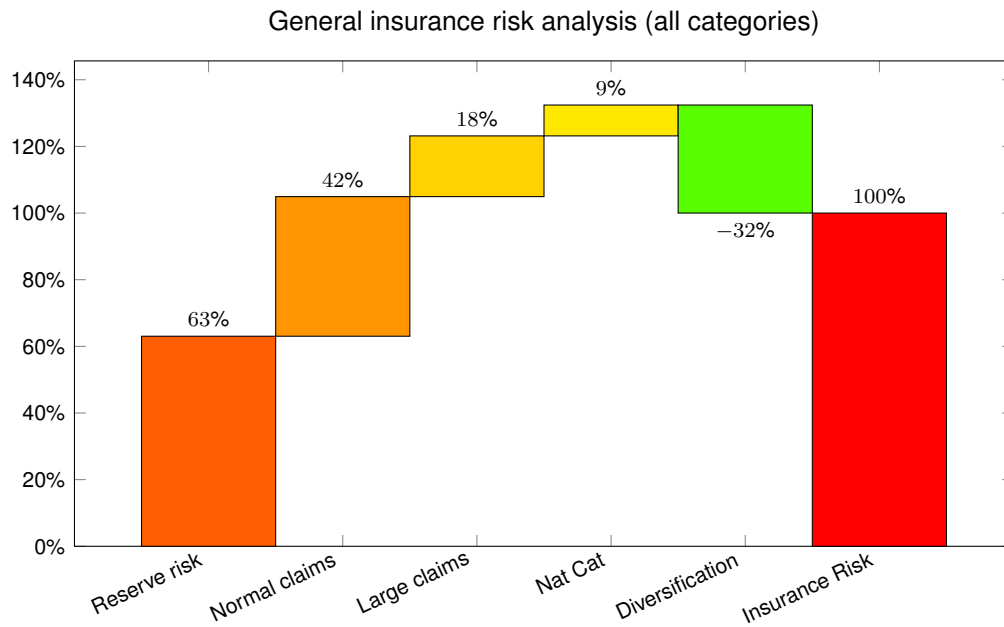


Figure 15a: General insurance (mean values by sector)

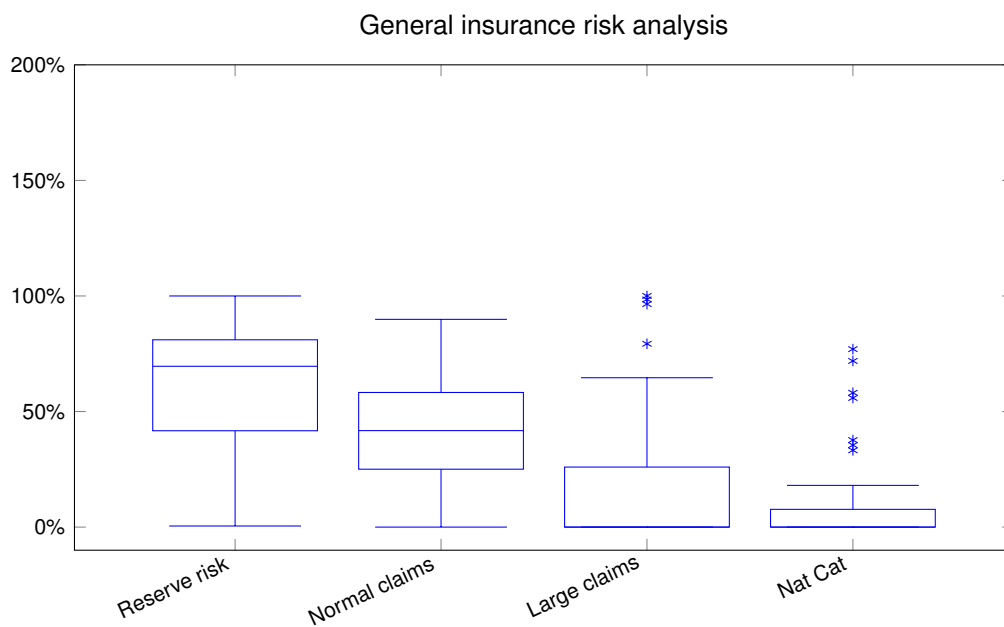


Figure 15b: General insurance (distribution as box-plot)

4.10 Market and credit risk scenarios

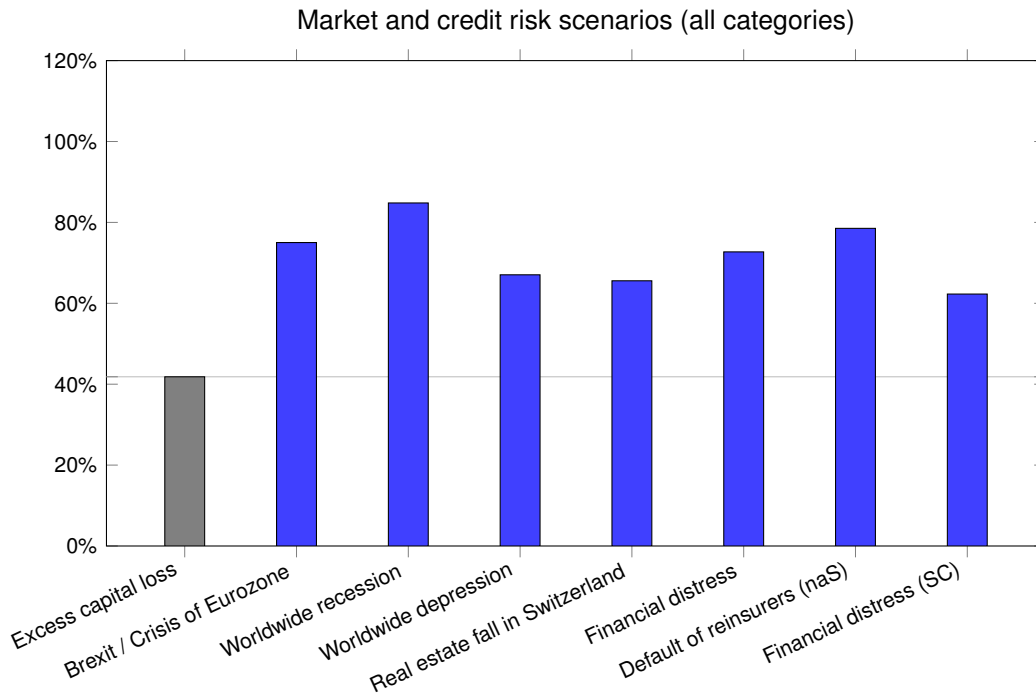


Figure 16a: General insurance (mean values by sector)

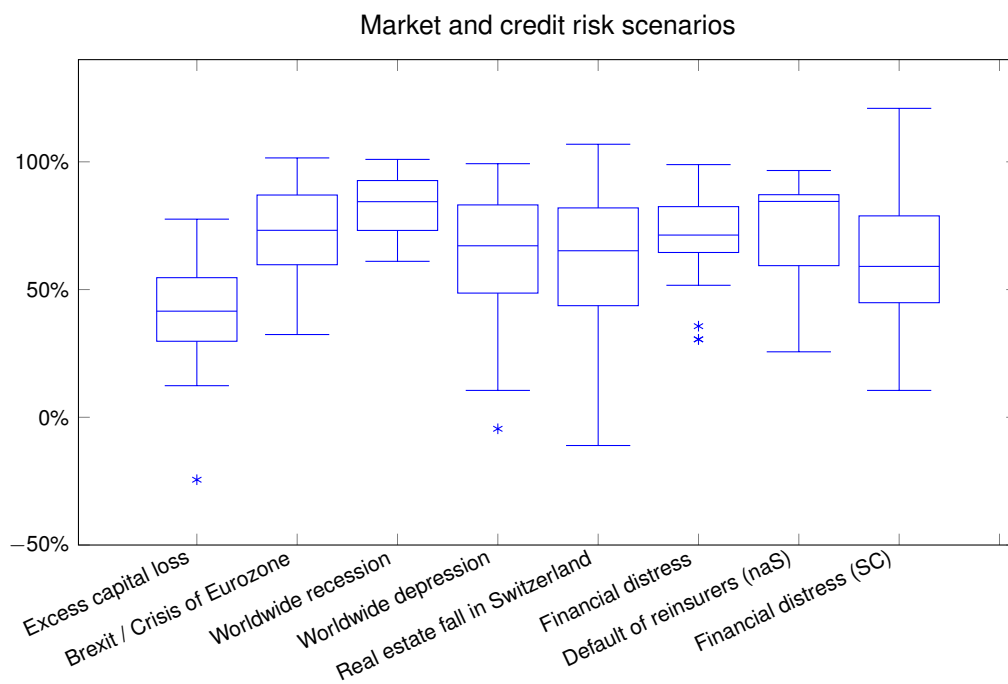


Figure 16b: General insurance (distribution as box-plot)

4.11 Insurance risk and global scenarios

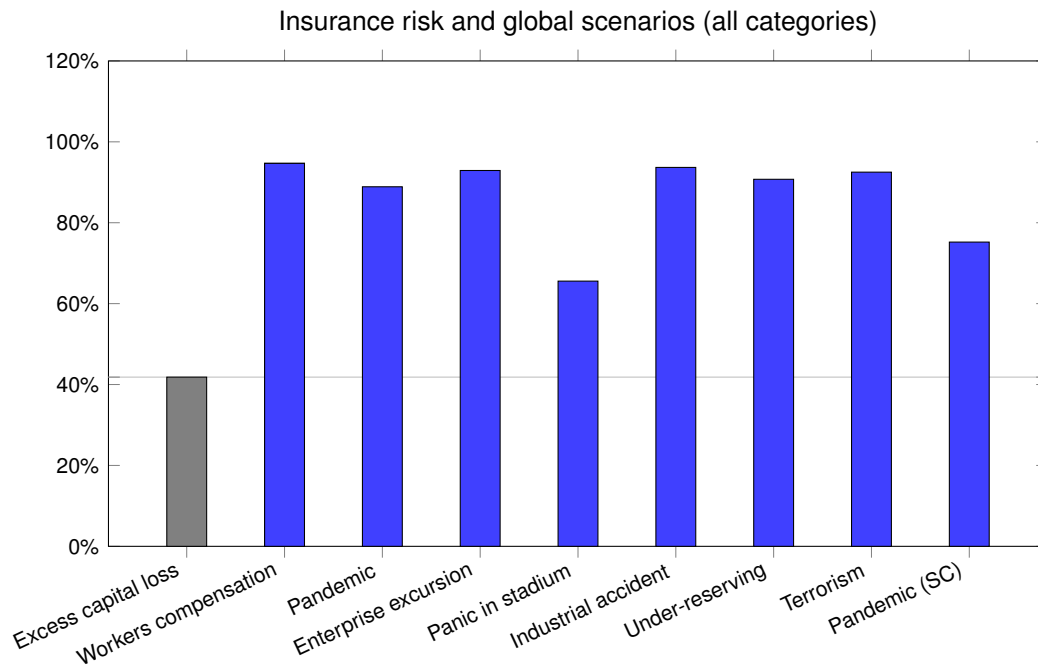


Figure 17a: General insurance (mean values by sector)

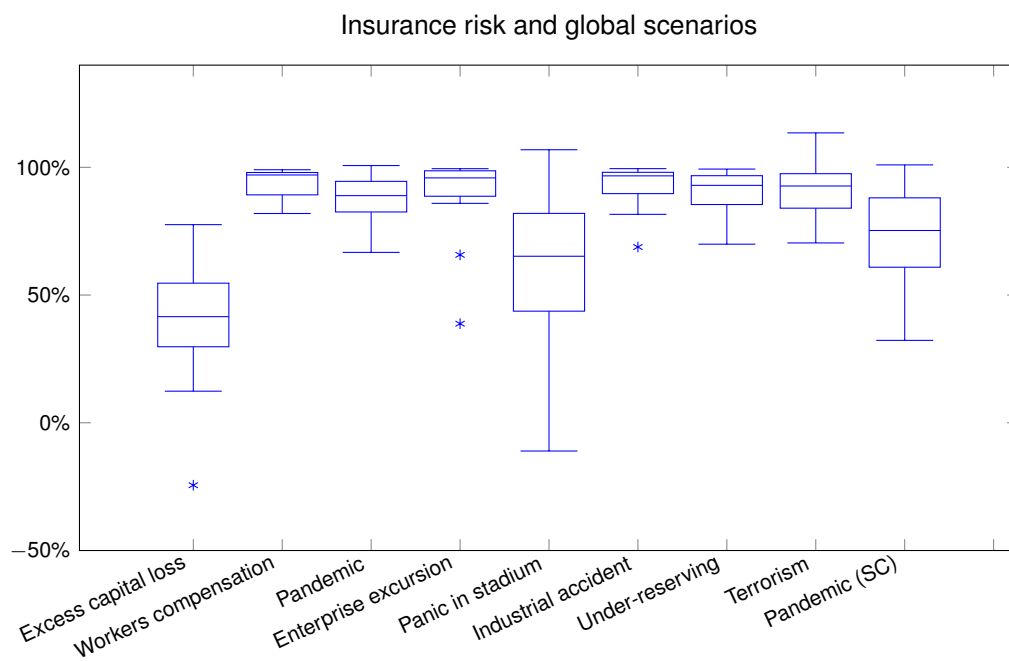


Figure 17b: General insurance (distribution as box-plot)

5 Health

5.1 Goals of the analyses

The analyses presented in this section give a deeper insight into:

- investment structure;
- liability structure;
- best estimate of liabilities and target capital in relation to the total assets;
- split of target capital into its components, e.g. market, credit and insurance risk;
- split of market risk into interest rate risk, equity risk, etc.;
- split of interest rate risk into different currencies;
- scenarios and their impact on risk-bearing capital; indication of whether the SST capital requirements after scenario impacts are still met.

Two types of graph are shown:

- waterfall diagrams;
- box plots providing information on data dispersion.

To avoid conclusions that can be drawn about an insurer's individual risk profile, the data are pooled by insurance sector. The graphs illustrate a breakdown of the indicators into their components. Any component based on less than five insurers is not included in the graph.

Assets

The total assets in the market-consistent balance sheet are shown as the sum of the different asset types (e.g. bonds, real estate, shares, etc.).

Liabilities

The total liabilities in the market-consistent balance sheet are split according to liability type.

Best estimate of liabilities and target capital in relation to the balance sheet total

The market value of assets (MV(A)) is decomposed into:

- best estimate of liabilities (BEL);
- market value margin (MVM);
- one-year capital requirement (SCR), which is computed as the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are linked through

$$TC = SCR + MVM \quad (1)$$

- excess capital (EC), which is defined as the difference between the risk-bearing capital (RBC) and the target capital (TC), which gives

$$RBC = TC + EC \quad (2)$$

- supplementary capital (SC);
- deductions (D).

More precisely:

$$MV(A) = BEL + MVM + SCR + EC - SC + D.$$

To show this, note that the core capital (CC) and the risk-bearing capital (RBC) are related through

$$RBC = CC + SC. \quad (3)$$

For the purpose of this analysis, the temporary adjustment term, where relevant, has been included in the supplementary capital. CC can now be expressed as:

$$CC = MV(A) - BEL - D,$$

from which the following relation is derived by means of (3):

$$MV(A) = BEL + RBC - SC + D.$$

By means of (1) and (2) we conclude that

$$\begin{aligned} MV(A) &= BEL + EC + TC - SC + D \\ &= BEL + MVM + SCR + EC - SC + D. \end{aligned}$$

Target capital decomposition

Target capital is the sum of the one-year capital requirement (SCR) and the market value margin (MVM). In turn, the SCR key components are market risk, credit risk, insurance risk and effect of the scenarios and diversification.

Market risk analysis

Market risk plays a dominant role in an economic, risk-based solvency regime. A number of risk factors, such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to market risk. Waterfall and box plot diagrams are used to present the most important market risk factors.

Interest rate risk analysis

Insurers with assets and liabilities denominated in different currencies are exposed to currency risk and generally also to interest rate risk. In such cases, the total interest rate risk comprises the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into four currencies CHF, EUR, USD and GBP, including the effect of diversification.

Scenarios

For each scenario, we computed the impact ratio, which is defined as the sum of risk-bearing capital (RBC) and the scenario impact (c), divided by the RBC:

$$\text{Impact ratio} = \frac{\text{RBC} + c}{\text{RBC}}.$$

Typically, a scenario impact c with a negative value represents a loss. To concentrate only on relevant scenarios, scenarios with no impact (i.e. $c = 0$) are ignored.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario is the *excess capital* (EC), i.e. $c = -\text{EC}$. This loss is understood as the maximum loss an insurer can endure and still remain solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). To obtain the corresponding impact ratio, we used relation (2), i.e. $\text{RBC} = \text{TC} + \text{EC}$;

$$\text{Impact ratio} = \frac{\text{RBC} - \text{EC}}{\text{RBC}} = \frac{\text{TC}}{\text{RBC}}.$$

To facilitate the comparison of general scenarios with this reference scenario, the latter is illustrated in a different colour.

Scenarios exempted from the target capital aggregation are labelled (naS) for “non-aggregated Scenarios”.

5.2 Comments on results

The overall SST ratio decreased by 6 percentage points from 256% in 2016 to 250% in 2017. The risk bearing capital increased slightly by 1.9% to CHF 9,672 million, while target capital went up by 8.0% to CHF 4,002 million.

This is mainly due to lower interest rates and the resulting increase of the market risk. Additionally, the effect of the scenarios (for companies writing exclusively health business) was replaced by a factor of 1.5, which led to a slightly higher target capital. In Figure 21a “Target capital decomposition” the impact of this factor is shown as “Capital Add-On (Health)”. That this add-on just neutralizes the diversification effect is coincidental.

The introduction of a new definition of the SST ratio had very little impact, as the current standard model for health insurers does not require the calculation of an MVM.

5.3 Assets

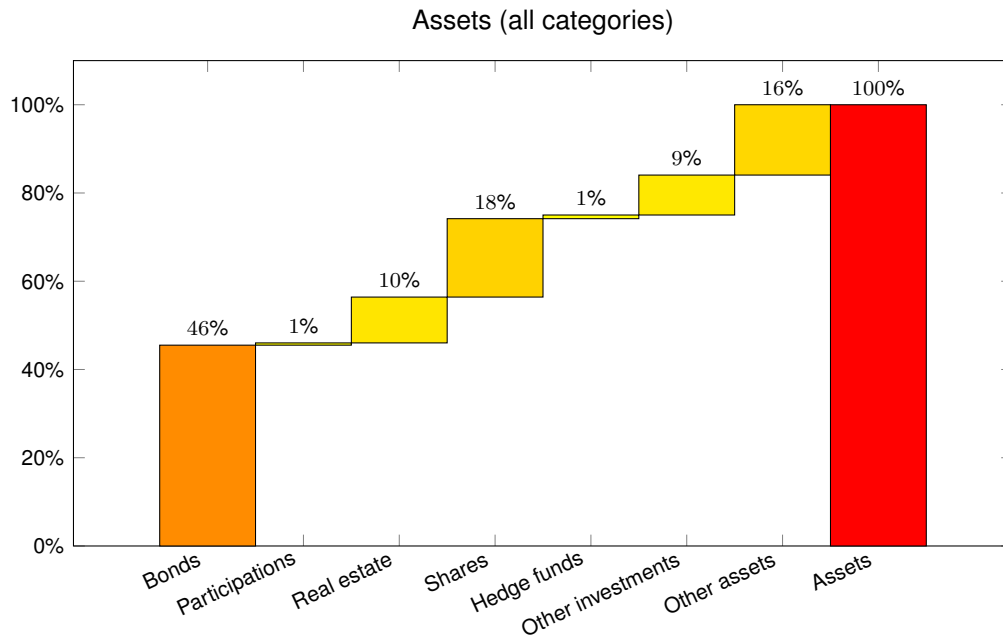


Figure 18a: Health (mean values by sector)

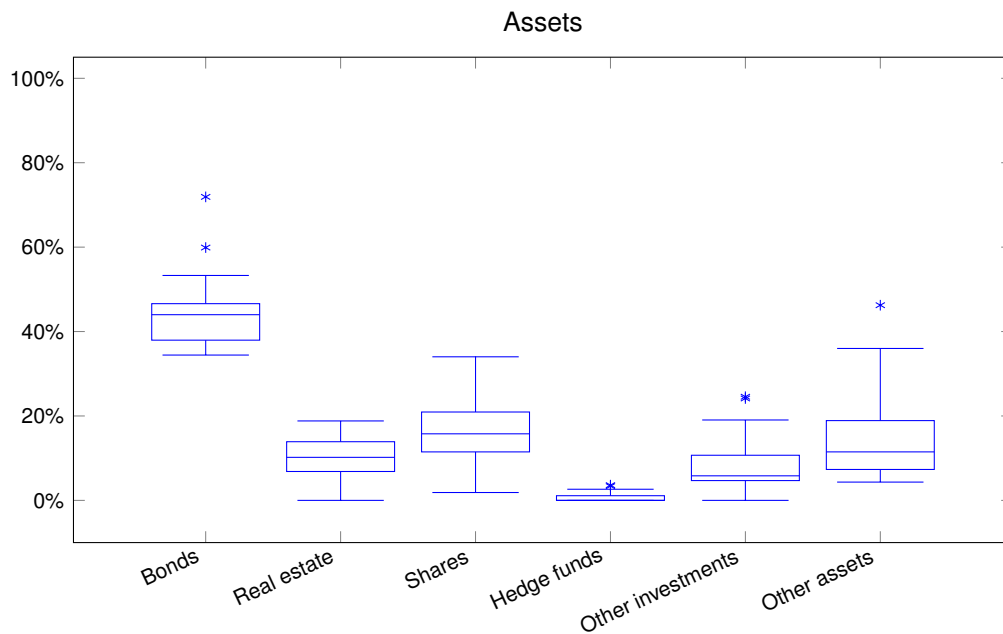


Figure 18b: Health (distribution as box-plot)

5.4 Liabilities

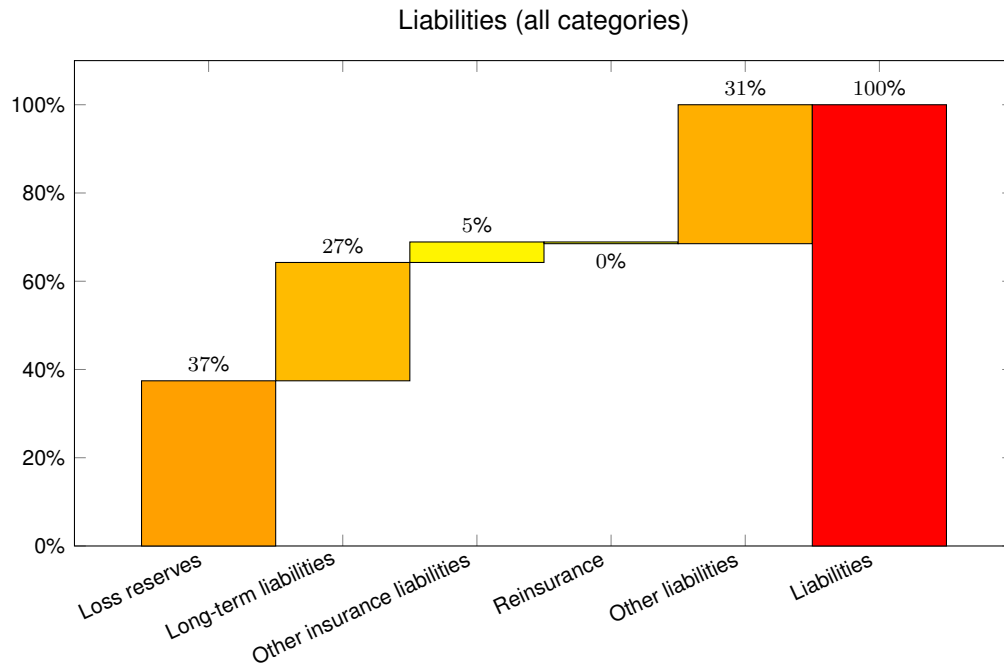


Figure 19a: Health (mean values by sector)

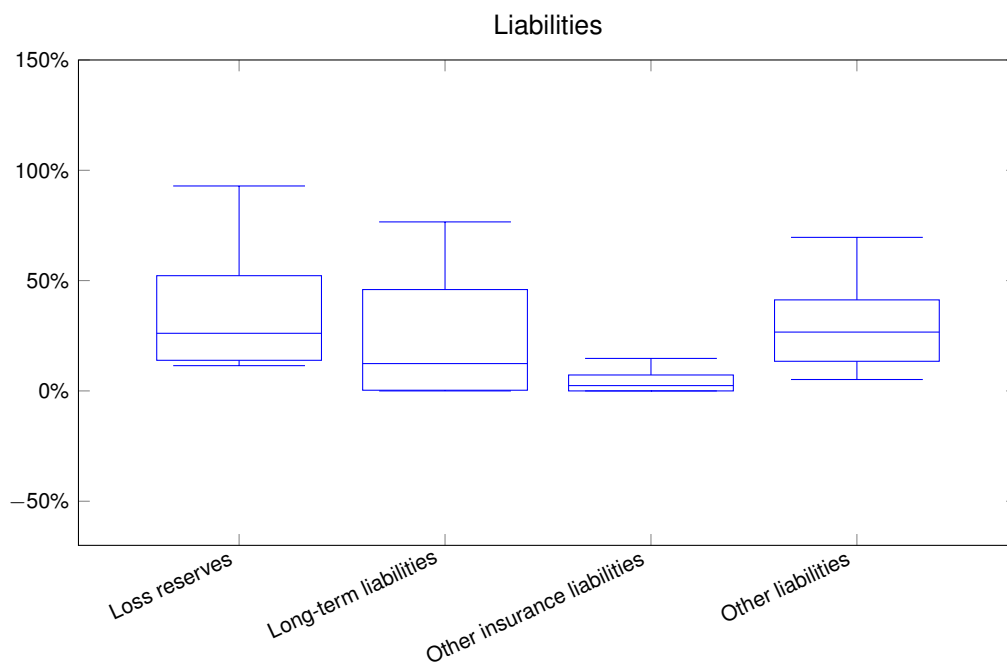


Figure 19b: Health (distribution as box-plot)

5.5 Best estimate of liability and target capital in relation to the balance sheet total

Best estimate of liability and target capital in relation to the balance sheet total (all categories)

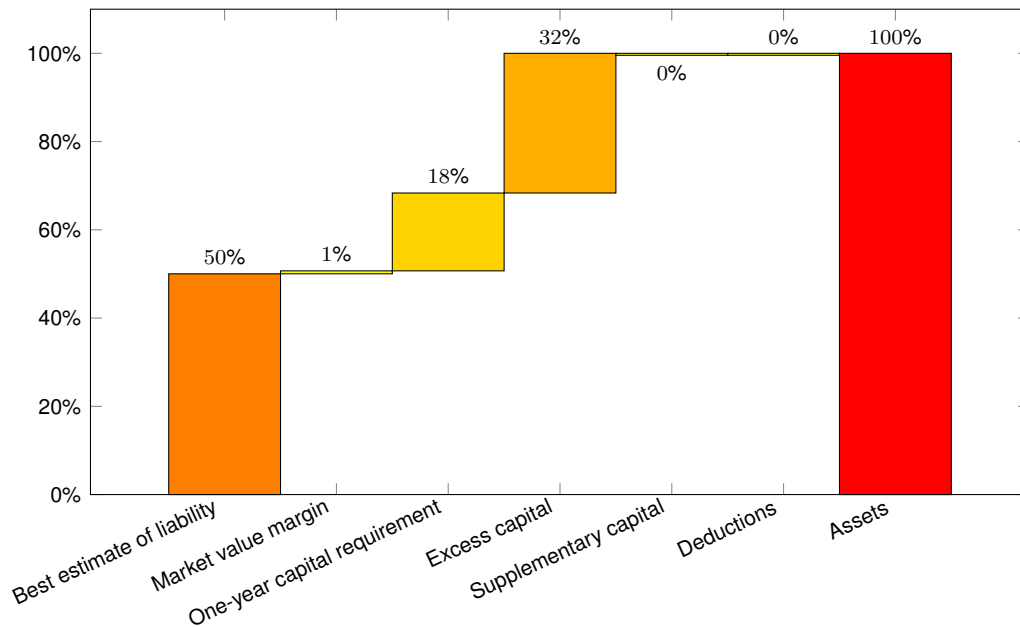


Figure 20a: Health (mean values by sector)

Best estimate of liability and target capital in relation to the balance sheet total

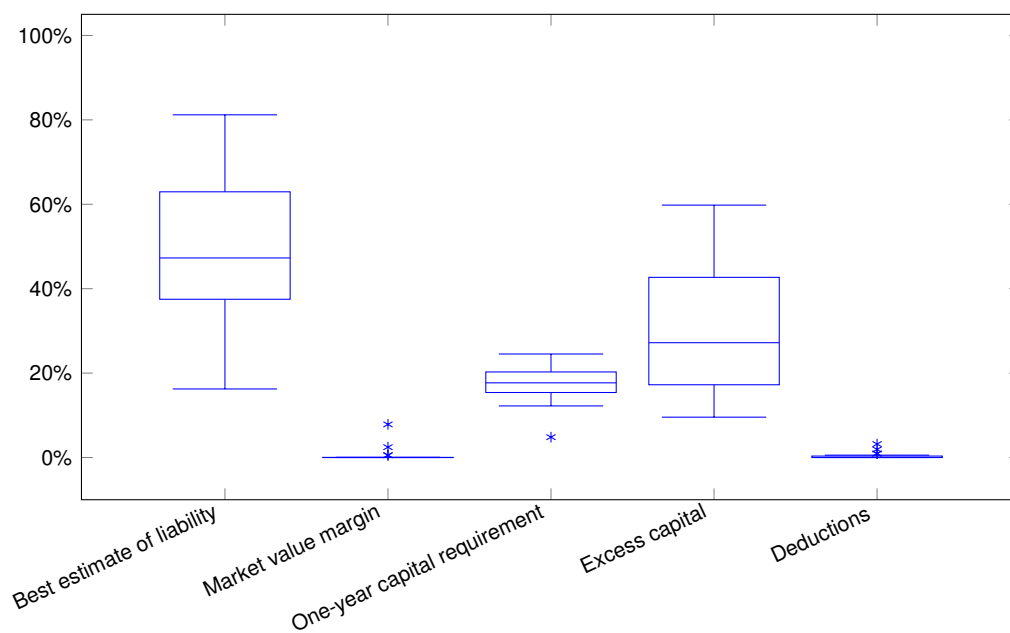


Figure 20b: Health (distribution as box-plot)

5.6 Target capital decomposition

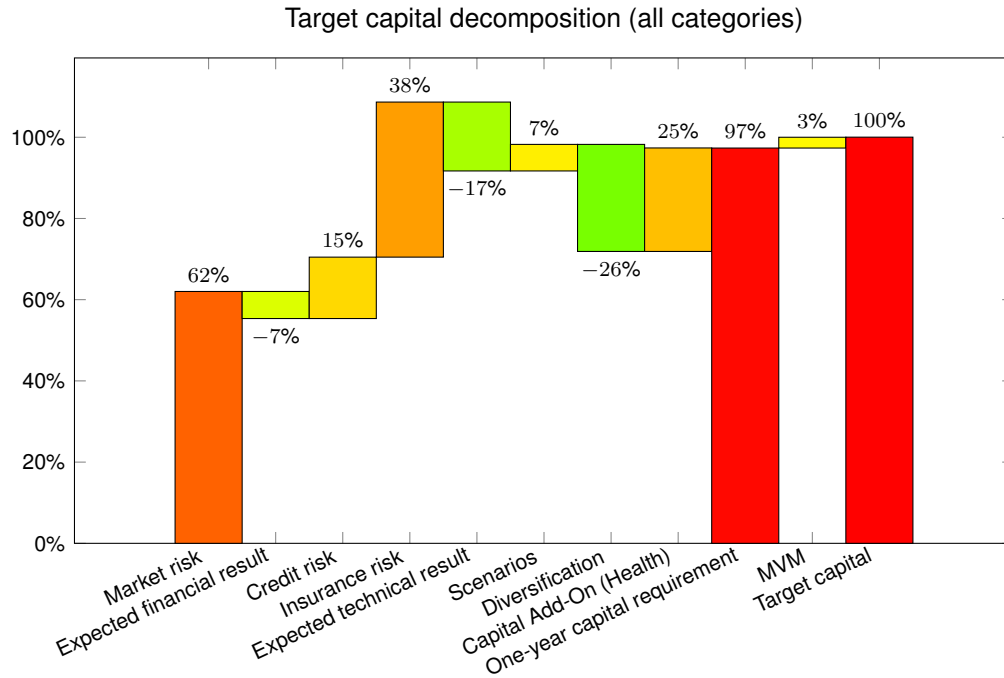


Figure 21a: Health (mean values by sector)

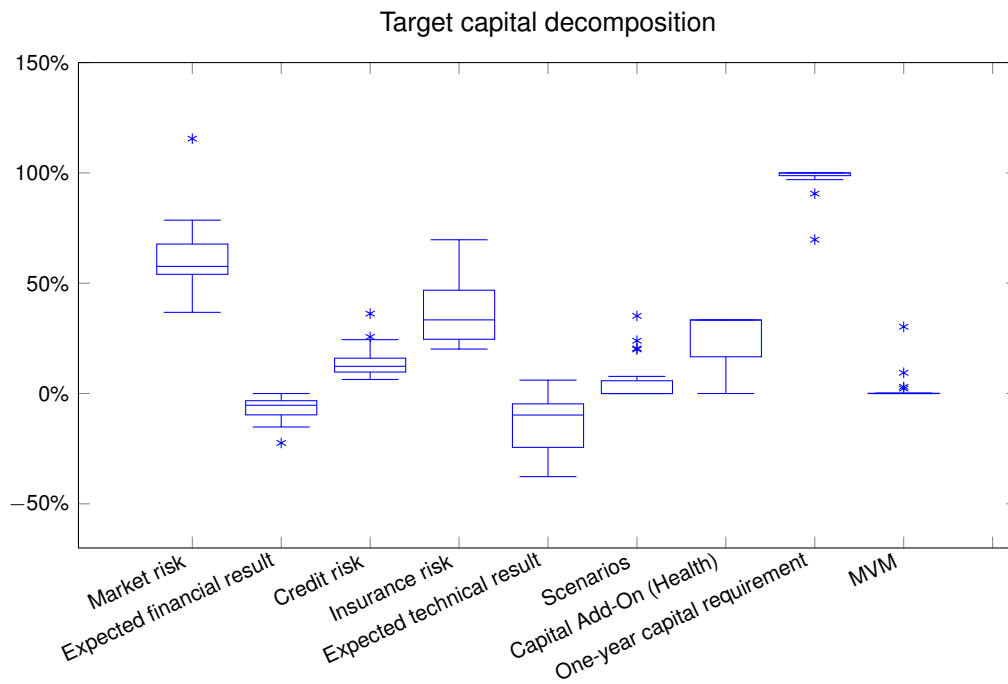


Figure 21b: Health (distribution as box-plot)

5.7 Market risk analysis

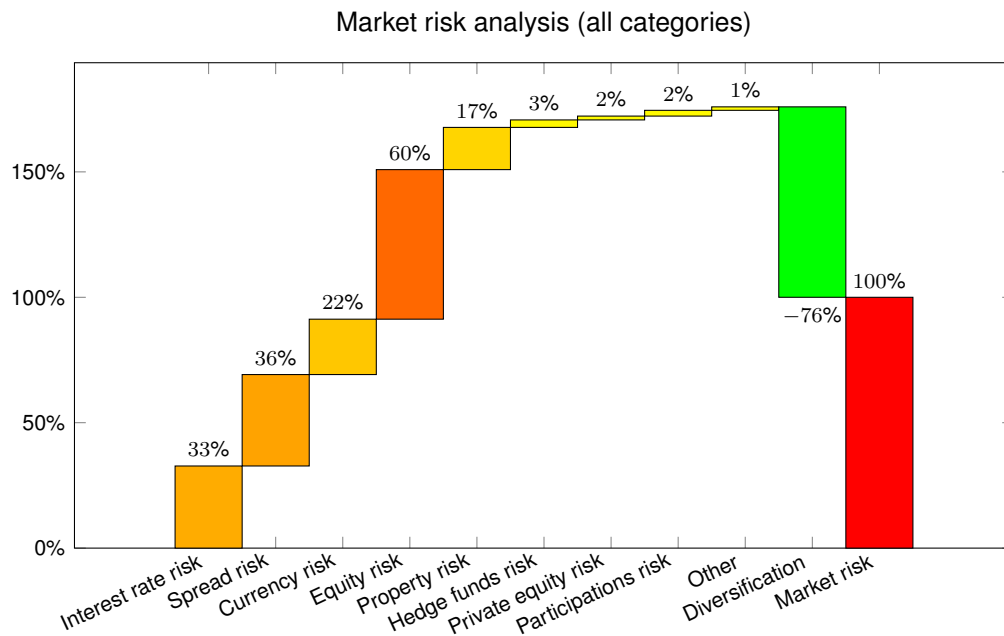


Figure 22a: Health (mean values by sector)

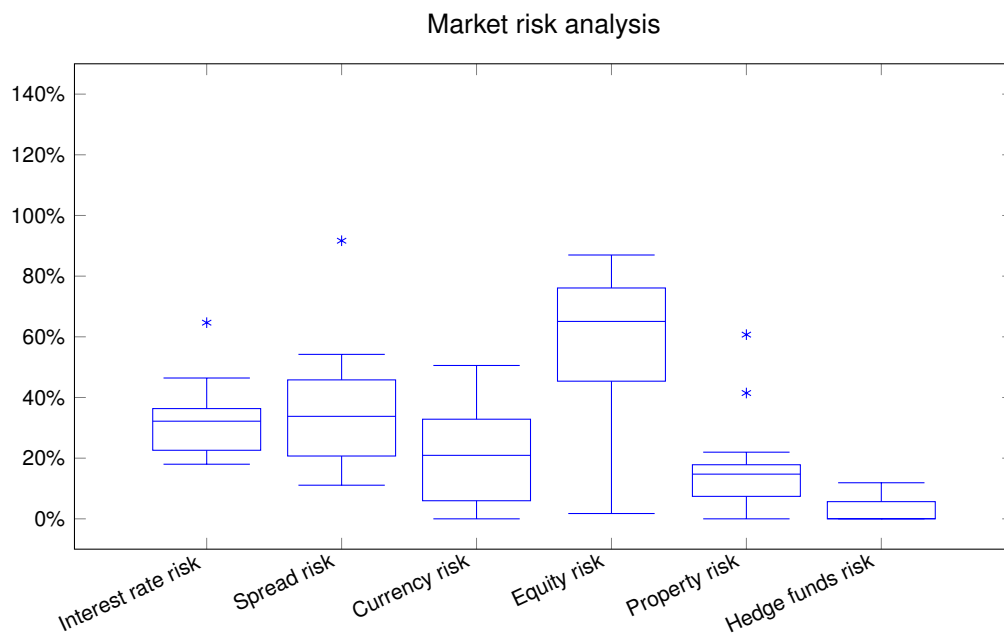


Figure 22b: Health (distribution as box-plot)

5.8 Interest rate analysis

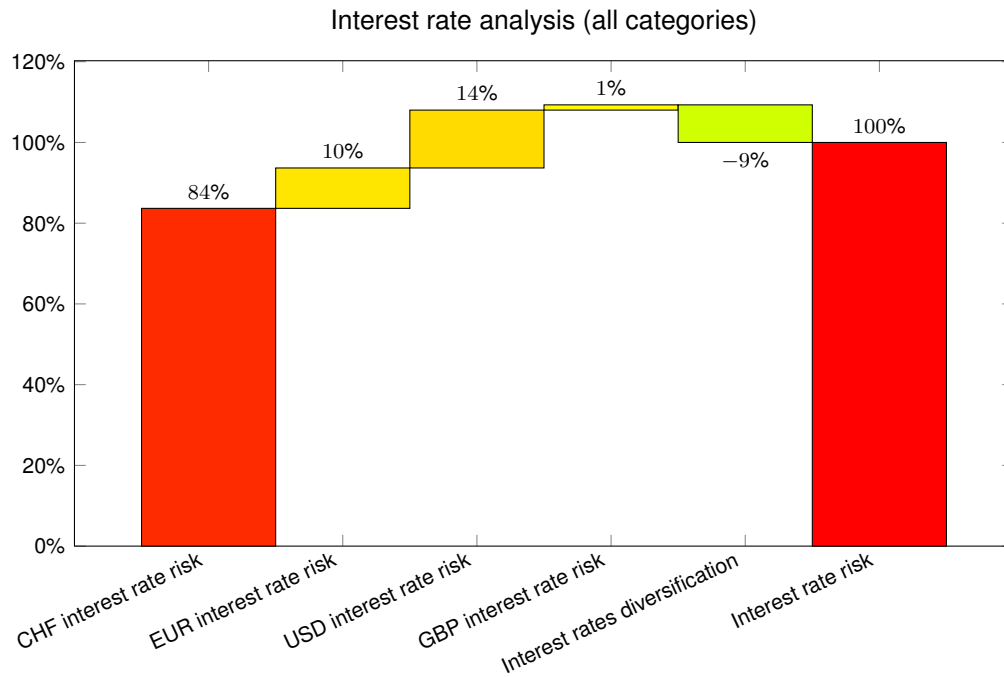


Figure 23a: Health (mean values by sector)

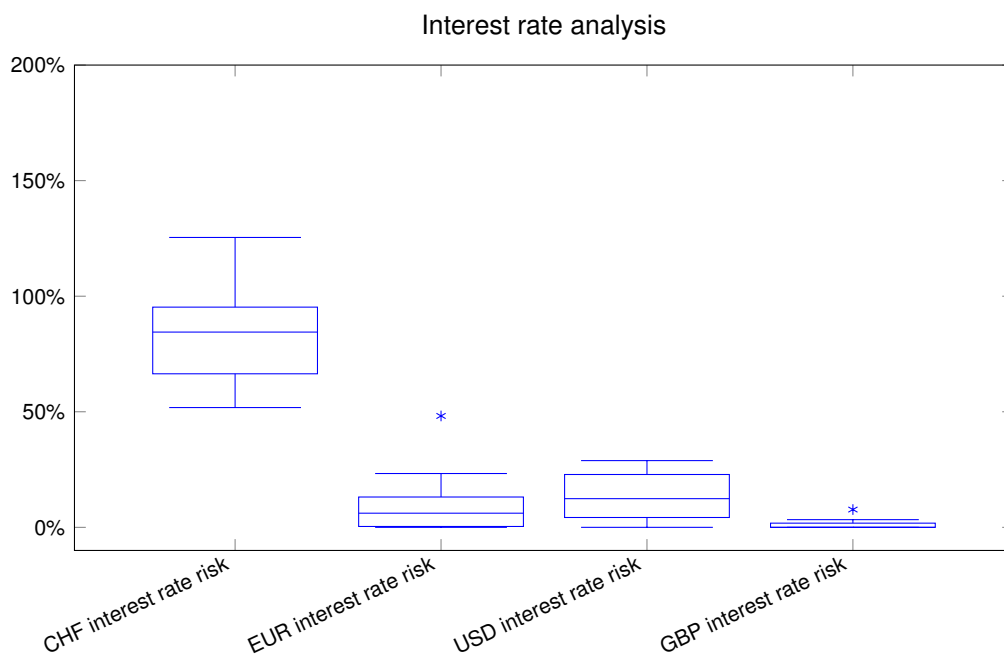


Figure 23b: Health (distribution as box-plot)

5.9 Market and credit risk scenarios

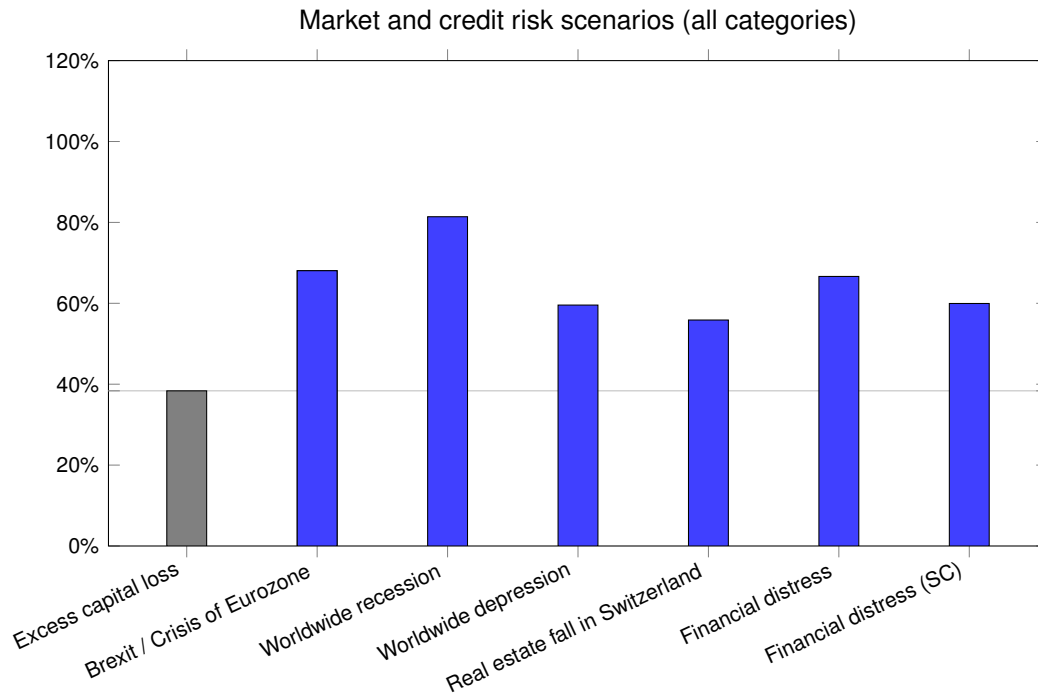


Figure 24a: Health (mean values by sector)

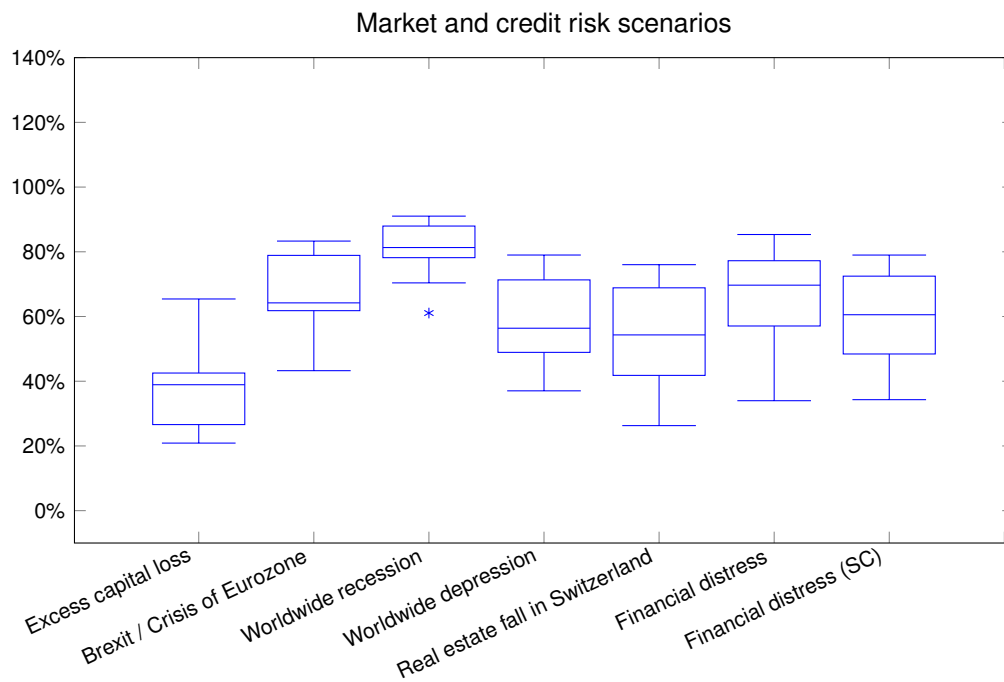


Figure 24b: Health (distribution as box-plot)

5.10 Insurance risk and global scenarios

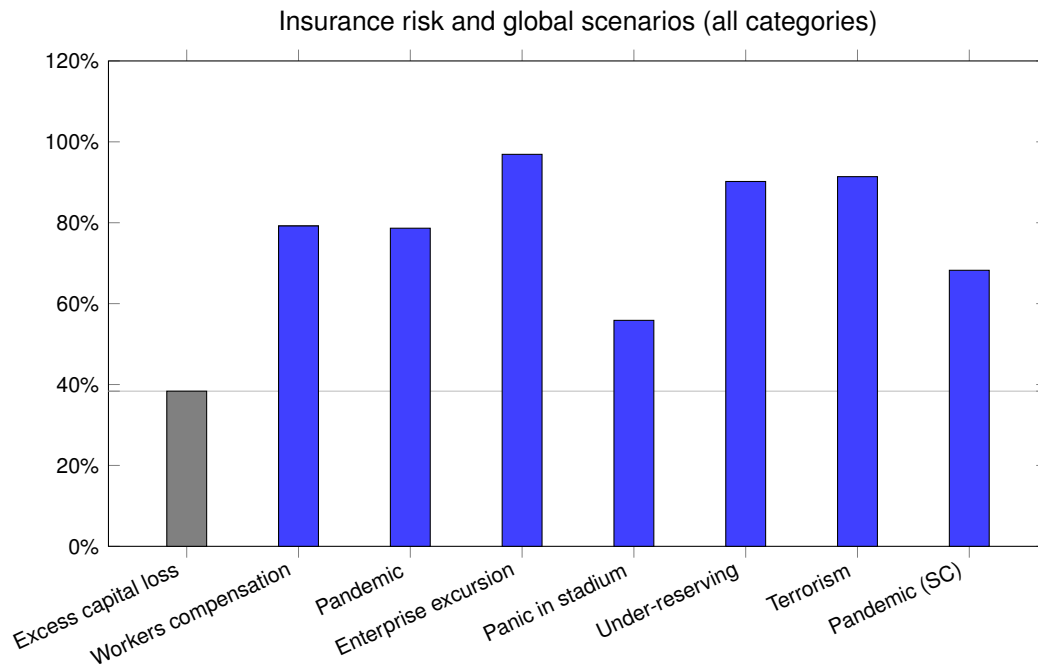


Figure 25a: Health (mean values by sector)

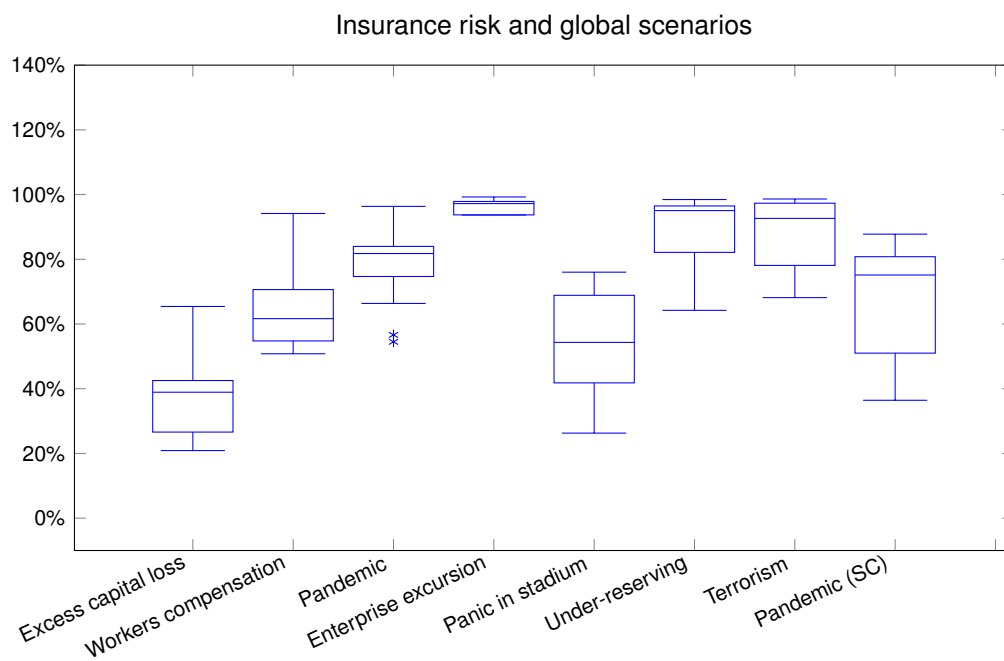


Figure 25b: Health (distribution as box-plot)

6 Reinsurance

6.1 Goals of the analyses

The analyses presented in this section give a deeper insight into:

- investment structure;
- liability structure;
- best estimate of liabilities and target capital in relation to the total assets;
- split of target capital into its components, e.g. market, credit and insurance risk;
- split of market risk into interest rate risk, equity risk, etc.;
- split of interest rate risk into different currencies;
- scenarios and their impact on risk-bearing capital; indication of whether the SST capital requirements after scenario impacts are still met.

Two types of graph are shown:

- waterfall diagrams;
- box plots providing information on data dispersion.

To avoid conclusions that can be drawn about an insurer's individual risk profile, the data are pooled by insurance sector. The graphs illustrate a breakdown of the indicators into their components. Any component based on less than five insurers is not included in the graph.

Assets

The total assets in the market-consistent balance sheet are shown as the sum of the different asset types (e.g. bonds, real estate, shares, etc.).

Liabilities

The total liabilities in the market-consistent balance sheet are split according to liability type.

Best estimate of liabilities and target capital in relation to the balance sheet total

The market value of assets ($MV(A)$) is decomposed into:

- best estimate of liabilities (BEL);
- market value margin (MVM);
- one-year capital requirement (SCR), which is computed as the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are linked through

$$TC = SCR + MVM \quad (1)$$

- excess capital (EC), which is defined as the difference between the risk-bearing capital (RBC) and the target capital (TC), which gives

$$\text{RBC} = \text{TC} + \text{EC} \quad (2)$$

- supplementary capital (SC);
- deductions (D).

More precisely:

$$\text{MV(A)} = \text{BEL} + \text{MVM} + \text{SCR} + \text{EC} - \text{SC} + \text{D}.$$

To show this, note that the core capital (CC) and the risk-bearing capital (RBC) are related through

$$\text{RBC} = \text{CC} + \text{SC}. \quad (3)$$

For the purpose of this analysis, the temporary adjustment term, where relevant, has been included in the supplementary capital. CC can now be expressed as:

$$\text{CC} = \text{MV(A)} - \text{BEL} - \text{D},$$

from which the following relation is derived by means of (3):

$$\text{MV(A)} = \text{BEL} + \text{RBC} - \text{SC} + \text{D}.$$

By means of (1) and (2) we conclude that

$$\begin{aligned} \text{MV(A)} &= \text{BEL} + \text{EC} + \text{TC} - \text{SC} + \text{D} \\ &= \text{BEL} + \text{MVM} + \text{SCR} + \text{EC} - \text{SC} + \text{D}. \end{aligned}$$

Target capital decomposition

Target capital is the sum of the one-year capital requirement (SCR) and the market value margin (MVM). In turn, the SCR key components are market risk, credit risk, insurance risk and effect of the scenarios and diversification.

Market risk analysis

Market risk plays a dominant role in an economic, risk-based solvency regime. A number of risk factors, such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to market risk. Waterfall and box plot diagrams are used to present the most important market risk factors.

Interest rate risk analysis

Insurers with assets and liabilities denominated in different currencies are exposed to currency risk and generally also to interest rate risk. In such cases, the total interest rate risk comprises the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into four currencies CHF, EUR, USD and GBP, including the effect of diversification.

Scenarios

For each scenario, we computed the impact ratio, which is defined as the sum of risk-bearing capital (RBC) and the scenario impact (c), divided by the RBC:

$$\text{Impact ratio} = \frac{\text{RBC} + c}{\text{RBC}}.$$

Typically, a scenario impact c with a negative value represents a loss. To concentrate only on relevant scenarios, scenarios with no impact (i.e. $c = 0$) are ignored.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario is the *excess capital* (EC), i.e. $c = -\text{EC}$. This loss is understood as the maximum loss an insurer can endure and still remain solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). To obtain the corresponding impact ratio, we used relation (2), i.e. $\text{RBC} = \text{TC} + \text{EC}$;

$$\text{Impact ratio} = \frac{\text{RBC} - \text{EC}}{\text{RBC}} = \frac{\text{TC}}{\text{RBC}}.$$

To facilitate the comparison of general scenarios with this reference scenario, the latter is illustrated in a different colour.

Scenarios exempted from the target capital aggregation are labelled (naS) for “non-aggregated Scenarios”.

6.2 Comments on results

The overall SST ratio is 223%. The risk bearing capital increased by 5.8% to CHF 60,157 million. The target capital increased by 4.7% to CHF 29,659 million. As the contribution of the 24 reinsurance captives to both TC and RBC is less than 2.5% in each case, their effect on the overall SST ratio can be considered to be marginal. In a restatement of the SST 2016 numbers, the new definition of the SST ratio led to an absolute improvement of about 18%.

Regarding the target capital decomposition the main risk driver was the insurance risk (69%) followed by the market risk (29%), the credit risk (16%) and the contribution of the scenarios (8%). The diversification effect was -14%.

6.3 Assets

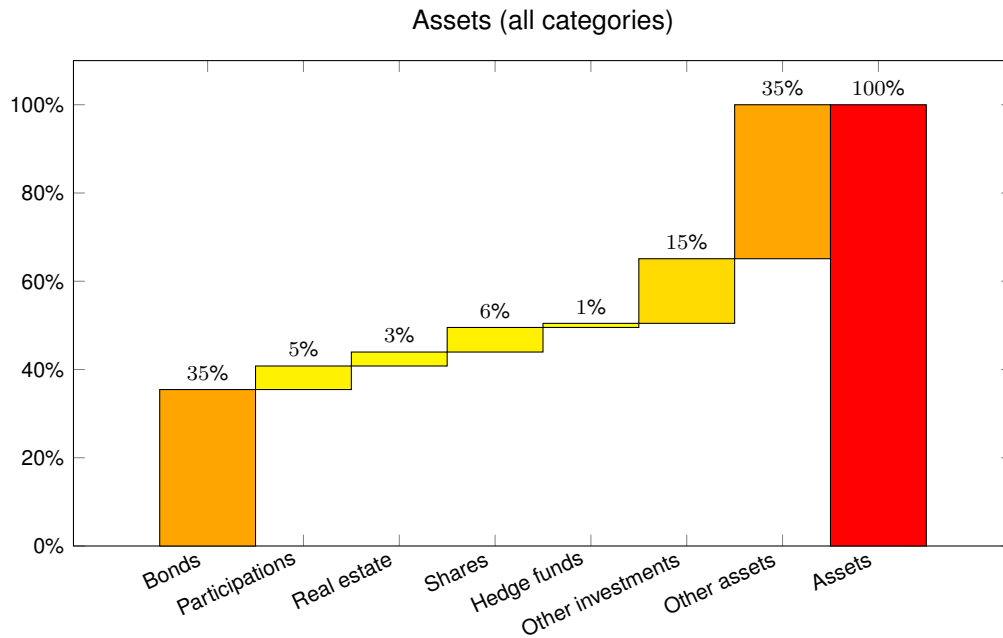


Figure 26a: Reinsurance (mean values by sector)

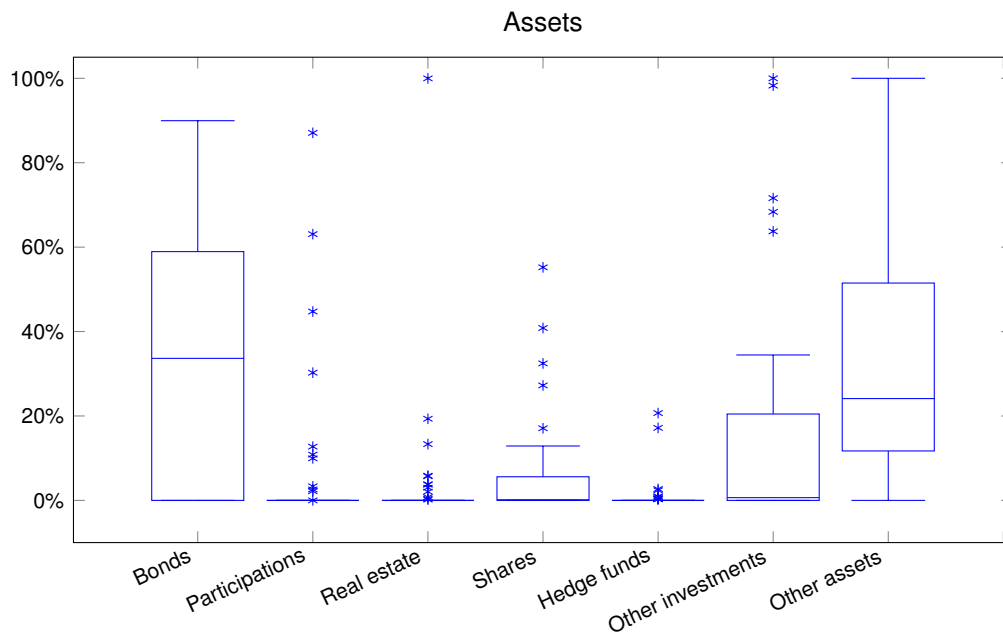


Figure 26b: Reinsurance (distribution as box-plot)

6.4 Liabilities

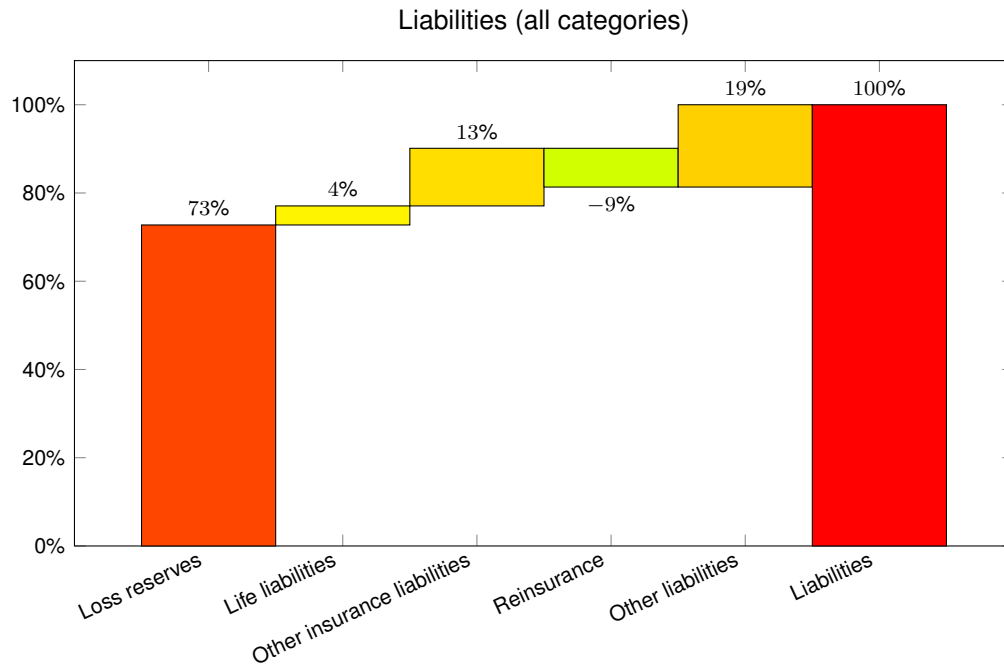


Figure 27a: Reinsurance (mean values by sector)

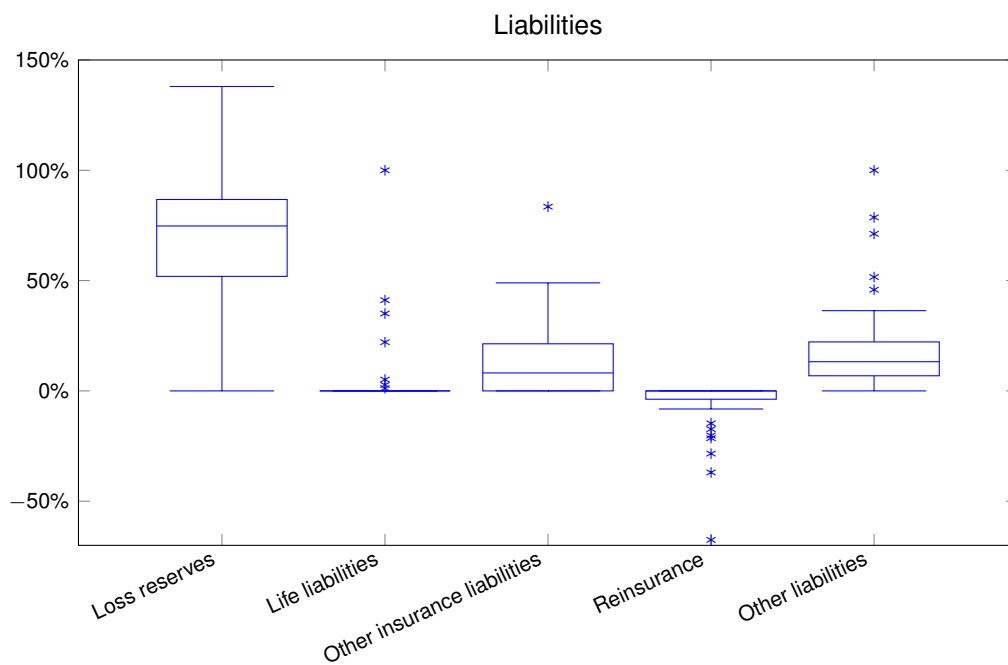


Figure 27b: Reinsurance (distribution as box-plot)

6.5 Best estimate of liability and target capital in relation to the balance sheet total

Best estimate of liability and target capital in relation to the balance sheet total (all categories)

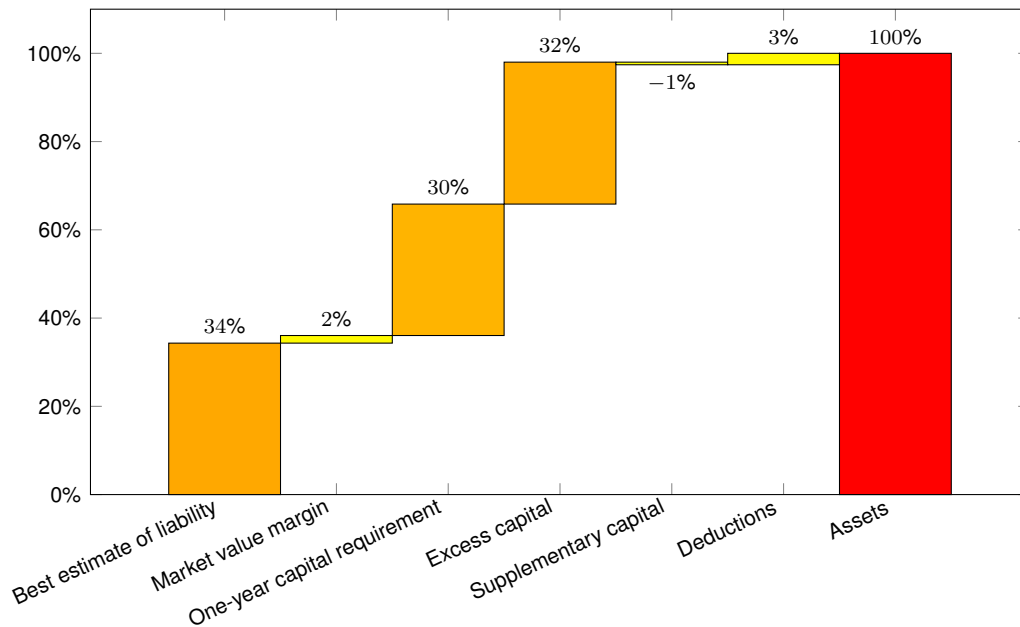


Figure 28a: Reinsurance (mean values by sector)

Best estimate of liability and target capital in relation to the balance sheet total

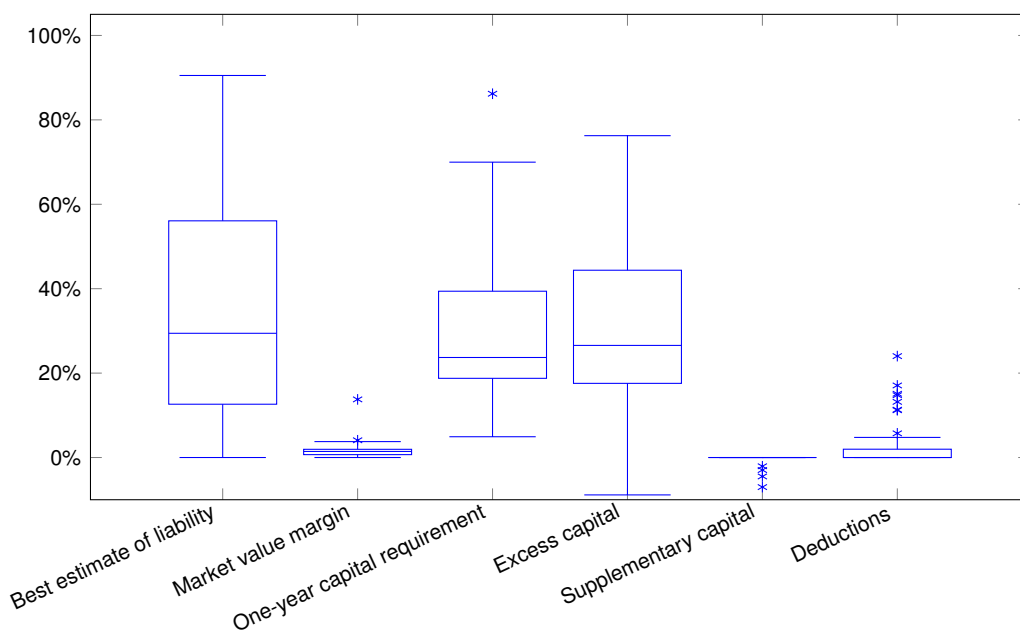


Figure 28b: Reinsurance (distribution as box-plot)

6.6 Target capital decomposition

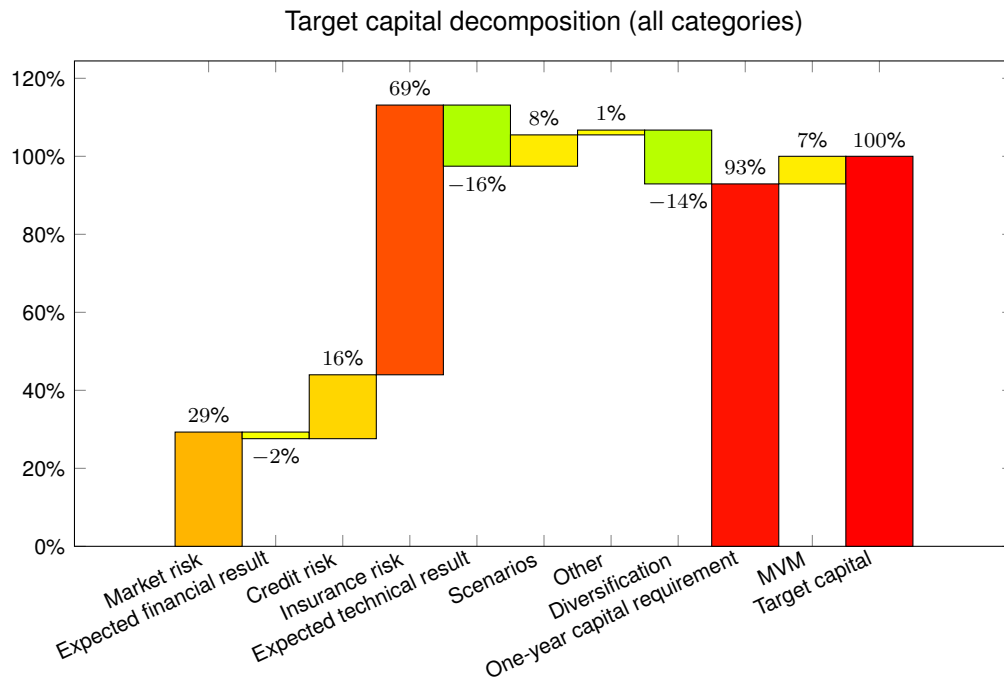


Figure 29a: Reinsurance (mean values by sector)

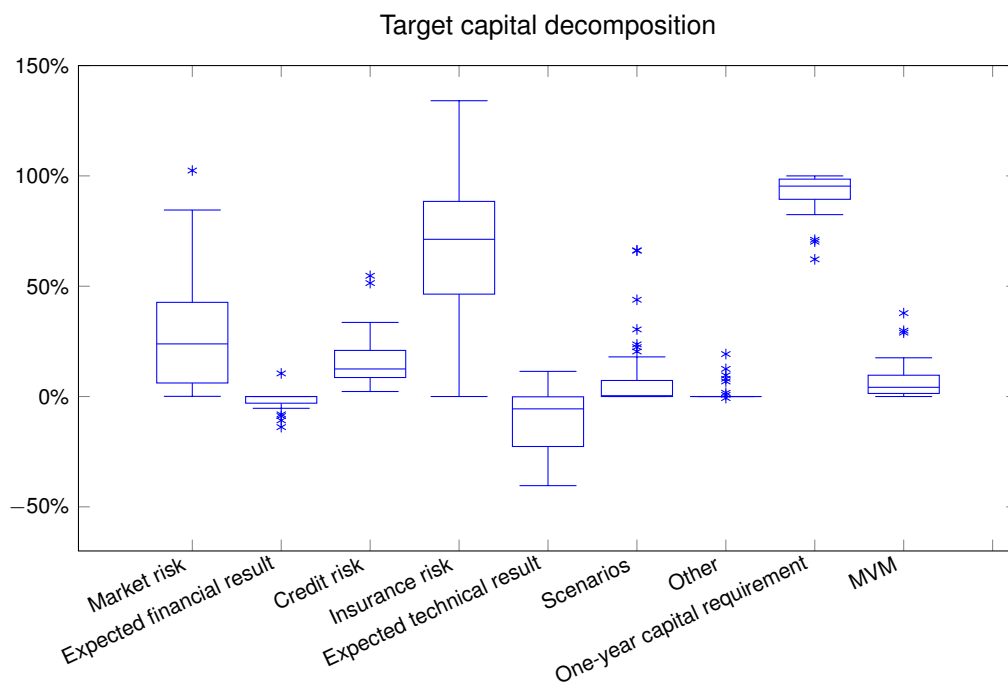


Figure 29b: Reinsurance (distribution as box-plot)

6.7 Market risk analysis

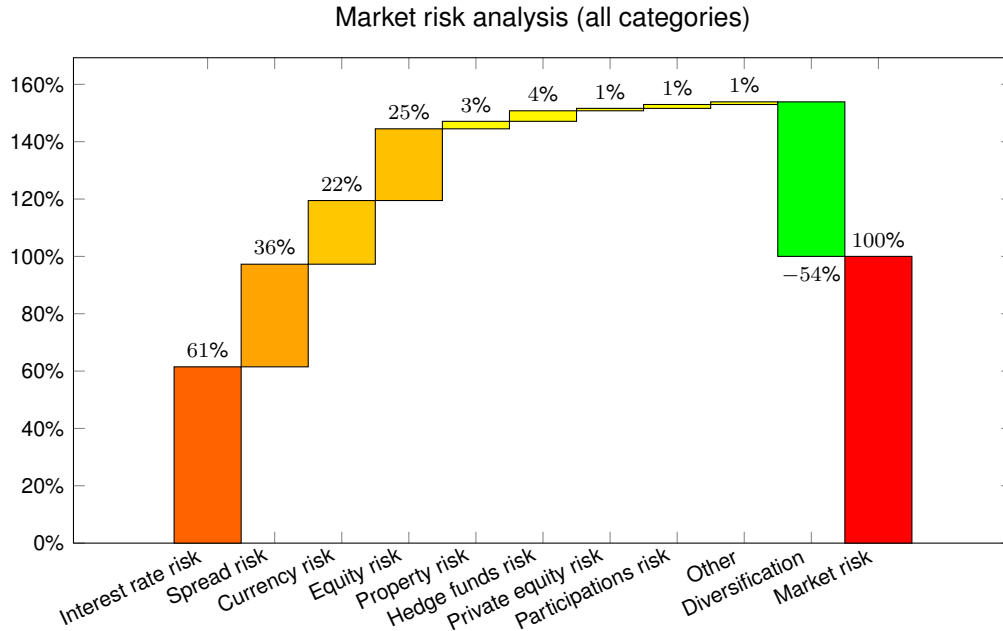


Figure 30a: Reinsurance (mean values by sector)

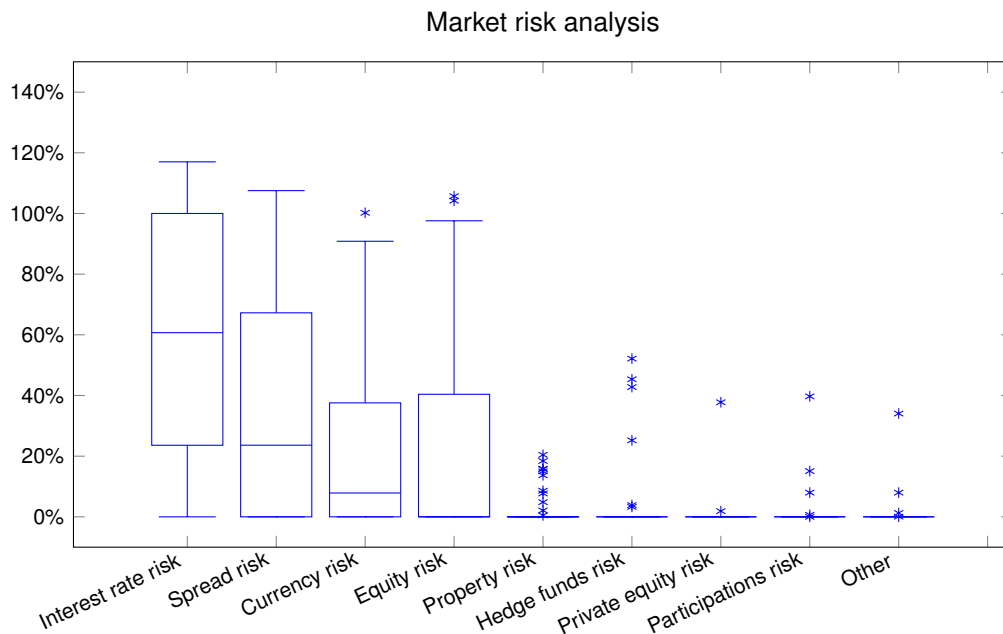


Figure 30b: Reinsurance (distribution as box-plot)

6.8 Interest rate analysis

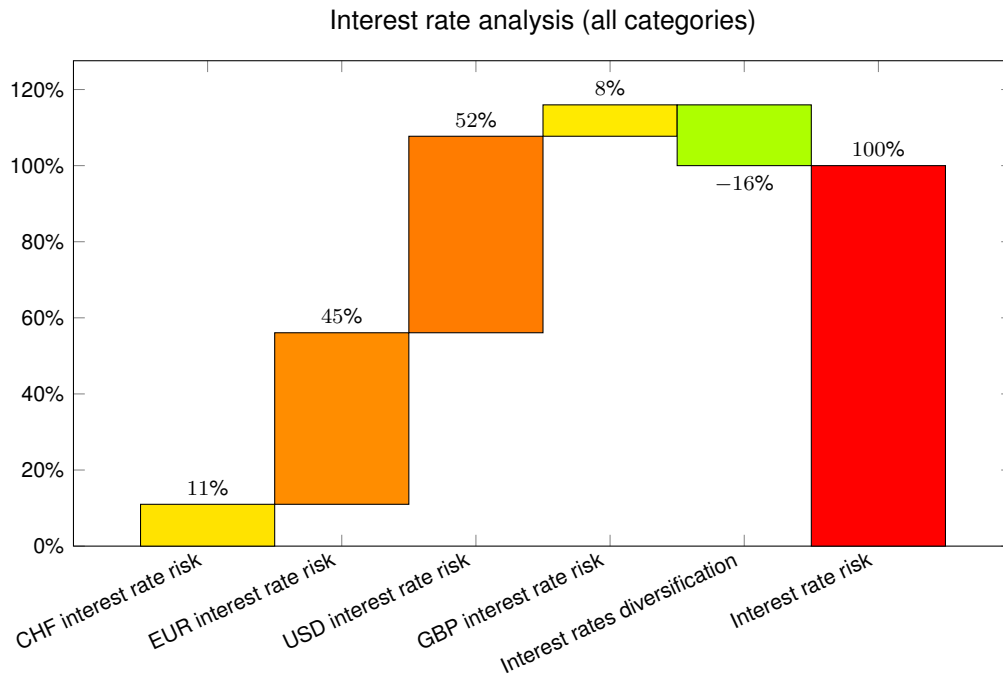


Figure 31a: Reinsurance (mean values by sector)

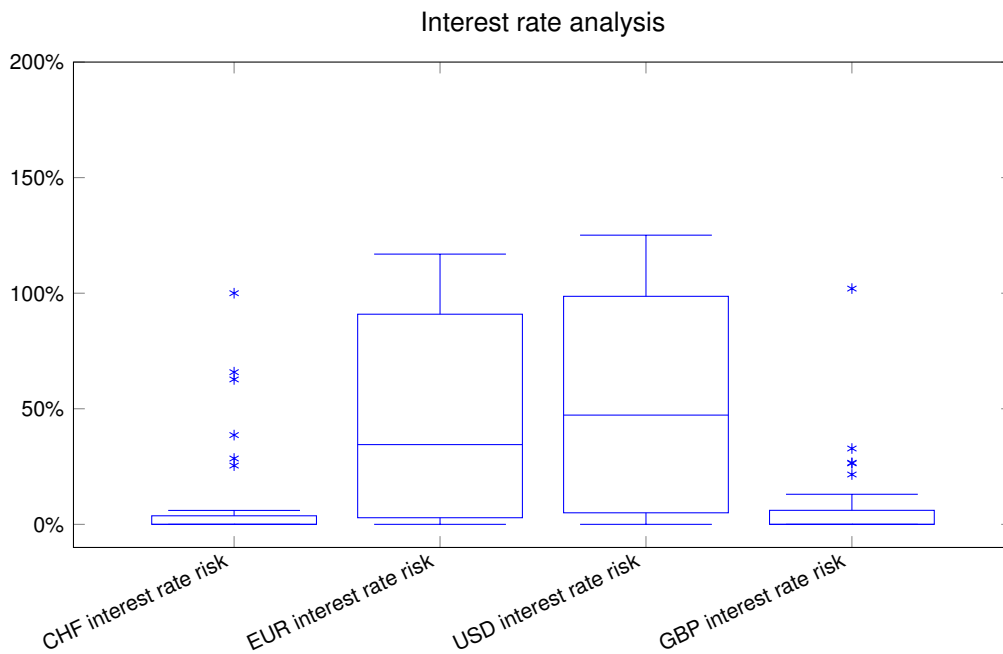


Figure 31b: Reinsurance (distribution as box-plot)

6.9 Market and credit risk scenarios

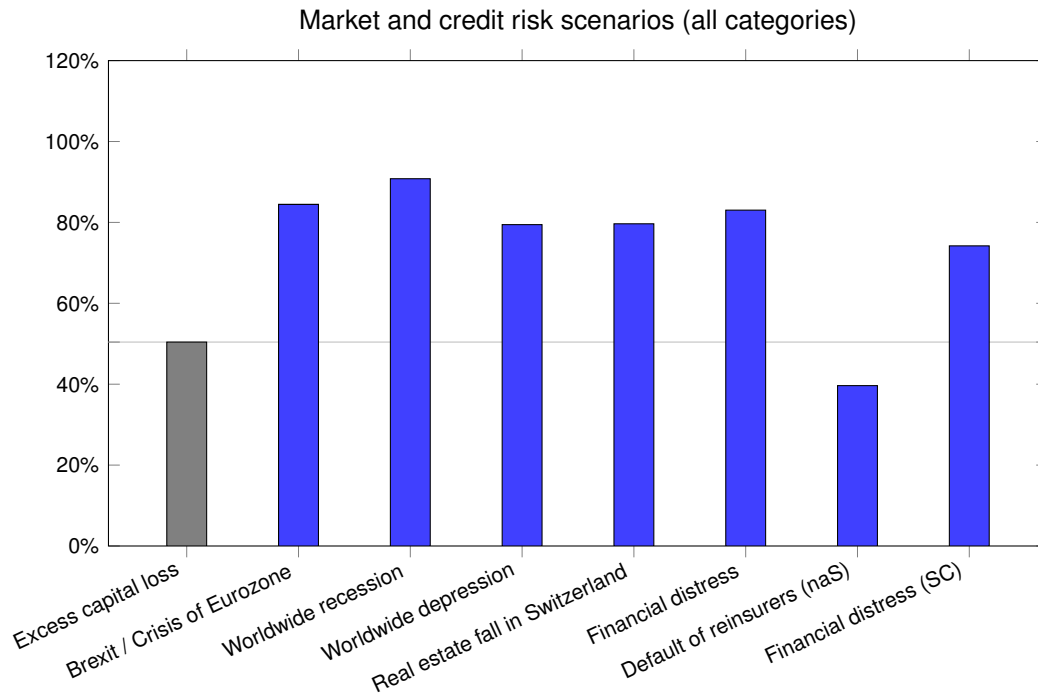


Figure 32a: Reinsurance (mean values by sector)

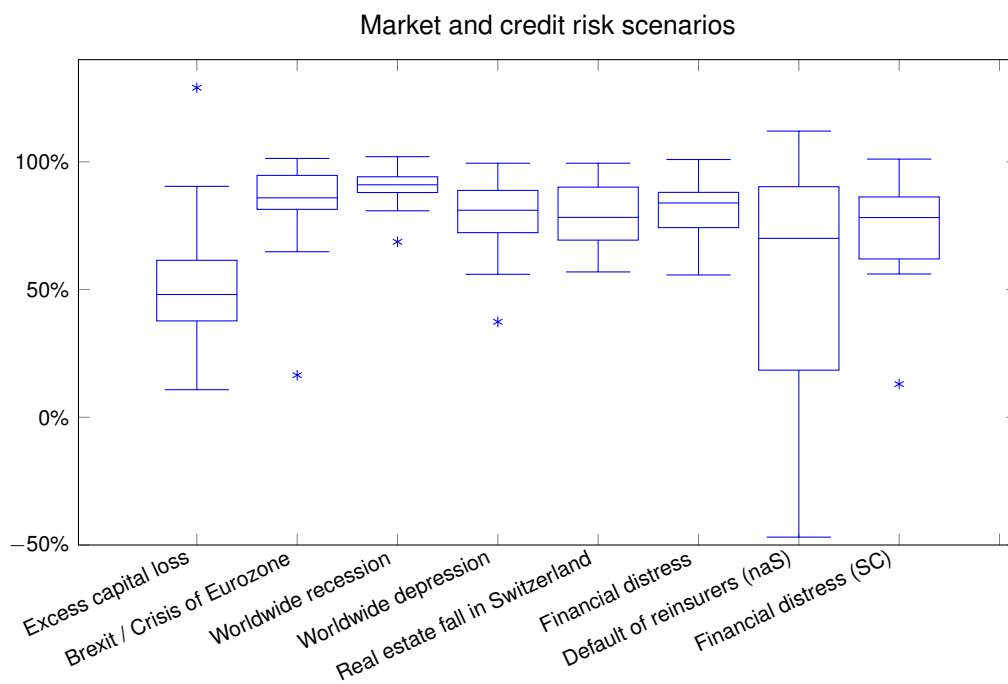


Figure 32b: Reinsurance (distribution as box-plot)

6.10 Insurance risk and global scenarios

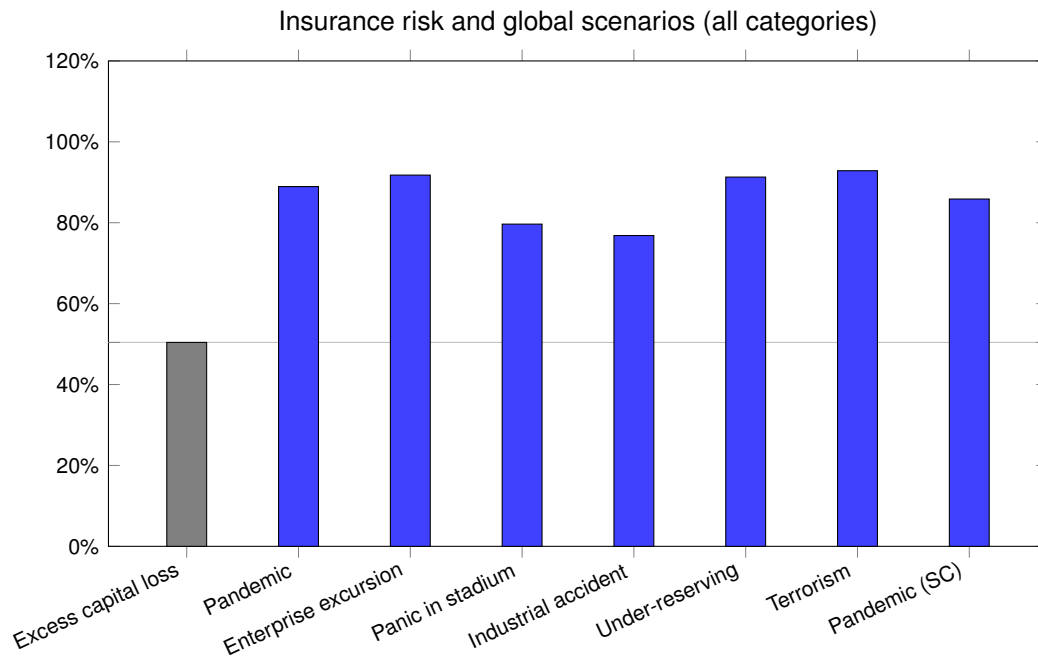


Figure 33a: Reinsurance (mean values by sector)

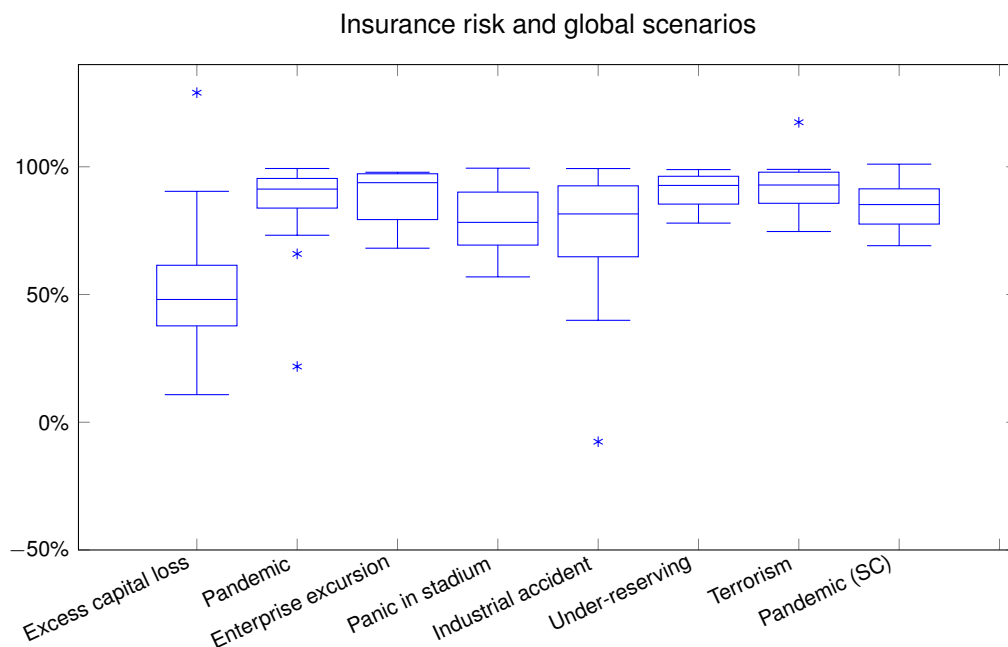


Figure 33b: Reinsurance (distribution as box-plot)

A Glossary for figures

In the following Appendix, the risk is measured by the 99% expected shortfall.

A.1 Assets

Bonds	Bonds and bonds from open-end funds.
Participations	Participations in enterprises which are not admitted for official quotation.
Real estate	Residential and commercial real estate.
Shares	Shares and own shares.
Hedge funds	Hedge funds and private equity.
Unit-linked life insurance	Assets covering unit-linked life insurance products.
Other investments	Other invested assets.
Other assets	Remaining assets, e.g. liquid assets, various claims, etc.

A.2 Liabilities

Loss reserves	Best estimate of liabilities, gross of reinsurance, for claims in general insurance or treatments in health insurance which happened prior to the reference date of the balance sheet.
Life liabilities	Best estimate of liabilities, gross of reinsurance, for life insurance contracts, excluding unit-linked liabilities.
Long-term liabilities	Best estimate of liabilities, gross of reinsurance, for health insurers owing to the fact that the insurer is obliged to renew the health insurance contract until the death of the insured.
Other insurance liabilities	Best estimate of other insurance liabilities, gross of reinsurance.
Reinsurance	Share of the insurance liabilities assumed by reinsurance contracts.
Unit-linked liabilities	Best estimate of liabilities, net of reinsurance, for unit-linked insurance contracts.
Other liabilities	Remaining liabilities, e.g. surplus funds, bonds/loans, various obligations, etc.

A.3 Best estimate of liabilities and target capital in relation to the balance sheet total

Best estimate of liabilities	Best estimate value of liabilities at the reference date of the SST.
Market value margin	Expected cost of the risk-bearing capital to be held for the settlement of the insurance liabilities over their lifetime.
One-year capital requirement	Risk arising from the one-year change in risk-bearing capital. The sum of the one-year capital requirement plus the market value margin equals the target capital.
Excess capital	Commonly used to refer to that part of the risk-bearing capital that is held by an insurer in excess of the target capital, i.e. risk-bearing capital minus target capital.
Supplementary capital	Additional capital eligible to cover an insurer's target capital such as hybrid capital or subordinated debt.
Deductions	Regulatory adjustments for determining an insurer's core capital. Deductions include, among others, own shares, goodwill and other intangibles, planned dividend payments or repayments of debt.

A.4 Target capital decomposition

Market risk	Standalone risk from financial market risk factors.
Expected financial result	Negative of the expected financial result on the assets in excess of the risk-free rate.
Credit risk	Standalone credit risk (default and migration).
Insurance risk	Standalone insurance risk.
Expected technical result	Negative of the expected result on the new insurance business, excluding the financial result.
Scenarios	Impact of the scenarios (prescribed and company-specific) on the target capital.
Other	Impact on the target capital of risks not included elsewhere (e.g. guarantee).
One-year capital requirement	Risk arising from the one-year change in risk-bearing capital. The sum of the one-year capital requirement and the discounted market value margin is equal to the target capital.

Market value margin	Expected cost of the risk-bearing capital to be held for the settlement of the insurance liabilities over their lifetime.
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A.5 Market risk analysis

Spread risk	Risk arising from corporate and governmental spreads over the risk-free rate.
Currency risk	Risk arising from the foreign exchange market.
Equity risk	Risk arising from quoted shares and share funds.
Property risk	Risk arising from real estate investments and real estate funds.
Hedge funds risk	Risk arising from hedge funds.
Private equity risk	Risk arising from private equity investments.
Participations risk	Risk arising from participations in enterprises not recognised for official quotation that is not private equity.
Other	Risk arising from market risk but not covered by above categories.

A.6 Interest rates analysis

CHF interest rate risk	Risk arising from Swiss risk-free interest rates.
EUR interest rate risk	Risk arising from euro risk-free interest rates.
USD interest rate risk	Risk arising from US risk-free interest rates.
GBP interest rate risk	Risk arising from British risk-free interest rates.

A.7 General insurance risk analysis

Reserve risk	Risk that ultimate costs relating to incurred claims (existing claims) vary from those assumed when the liabilities were estimated. Reserve risk arises from claim sizes being greater than expected or differences in timing of claims payments from expected.
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Normal claims	<p>Risk from claims with loss amounts below a certain threshold value, typically characterized by high frequencies and low severities.</p> <p>Related terms: frequency claims, small claims, attritional claims</p>
Large claims	<p>Risk from claims with loss amounts above a certain threshold value, typically characterized by low frequencies and high severities.</p>
Nat Cat	<p>Risk from claims triggered by a single event, or a series of events (natural hazards such as earthquake, flood, hail, storm, etc.), of major magnitude, usually over a short period (often 72 hours) that lead to a significant deviation in actual claims from the total expected claims.</p>

B Global glossary

Core capital	<p>Core measure of an insurer's strength from a regulatory perspective. Core capital equals the market-consistent value of assets minus the market-consistent value of liabilities minus deductions plus the market value margin.</p> <p>Related terms: market-consistent valuation, market value margin, deductions</p>
Cost of capital charge	<p>Cost rate used to determine the costs expected for all future one-year capital requirements until run-off.</p>
Economic balance sheet	<p>Balance sheet statement based on market-consistent values for all assets and liabilities relating to in-force business, including off-balance sheet items.</p> <p>Related terms: market-consistent valuation, total balance sheet approach</p>
Expected shortfall	<p>A coherent risk measure. For a given confidence level of $1 - \alpha$, it measures the average losses over the threshold defined (typically set as the value-at-risk for a percentile given), i.e. the conditional mean value, given that the loss exceeds the $1 - \alpha$ percentile.</p> <p>Related term: value-at-risk</p>
Fundamental data sheet	<p>Form to report figures for the annual SST reporting process. It needs to be filled in by all insurers, regardless of whether they use an internal model or the SST standard model.</p>
Market-consistent valuation	<p>The practice of valuing assets and liabilities on market values, where observable, with a given quality (mark-to-market); where not, on market-consistent valuation techniques (mark-to-model).</p>

<p>Premium risk</p>	<p>Risk that ultimate costs relating to <i>future</i> claims vary from those assumed when the obligations were estimated. Premium risk arises from claim sizes being greater than expected or differences in claims frequency from those expected. Premium risk is composed of frequency claims, large claims and catastrophe claims.</p> <p>Synonyms: current year risks, underwriting risks, pricing risk</p> <p>Related terms: reserve risk</p>
<p>Risk-bearing capital</p>	<p>Capital which may be taken into account when determining the insurer's available capital for SST purposes. Risk-bearing capital is defined as the sum of the core capital with the supplementary capital.</p> <p>Related terms: core capital, supplementary capital</p>
<p>Risk-free interest rate</p>	<p>Risk-free interest rate is the theoretical rate of return of an investment with no risk of financial loss.</p> <p>Related term: risk-free yield curve</p>
<p>Risk-free yield curve</p>	<p>Curve that shows the relation between the risk-free interest rate (or cost of borrowing) and the time to maturity (the term) of the debt for a given borrower in a given currency. The yield curves corresponding to the bonds issued by governments in their own currency are called the government bond yield curves and considered as risk-free in the context of the SST.</p> <p>Related terms: risk-free interest rate, risky yield curve, adjusted yield curve</p>
<p>Risky yield curve</p>	<p>Curve that shows the relation between the interest rate (or cost of borrowing) and the time to maturity (the term) of the debt for a given borrower in a given currency. Risky yield curves are typically higher than risk-free yield curves as they reflect the creditworthiness of the different institutions that borrow money from each other. Banks with high credit ratings (Aa/AA or above) borrow money from each other at the LIBOR rates. The corresponding yield curves are known as the LIBOR curve or the swap curve. The risky yield curve within the SST context is based on the swap curve.</p> <p>Related term: risk-free yield curve</p> <p>Reference: FINMA Circular 2013/2 "Temporary Adjustments to the Swiss Solvency Test (SST)"</p>

Supervisory category	<p>System of six risk categories to which each supervised institution is assigned. Categorisation is based on the risks posed to creditors, investors and policyholders, as well as to the entire system, and to Switzerland's reputation as a financial centre. Supervised institutions in category 1 are characterised by their size and global relevance, and the associated significant risks posed at various levels. In the other categories, the institutions' risk potential decreases incrementally to category 5, while those in category 6 are not subject to prudential supervision.</p> <p>Reference: FINMA Newsletter 19 (2011) "Overhaul of FINMA's supervisory approach"</p>
Supplementary capital	<p>Additional capital eligible to cover an insurer's target capital. Supplementary capital is split between lower supplementary capital and upper supplementary capital, depending on how well the capital can absorb losses. Supplementary capital includes instruments with risk-absorbing properties such as hybrid capital or subordinated debt. For instance, perpetual subordinated loans qualify as upper supplementary capital, whereas subordinated bonds with a fixed maturity date qualify as lower supplementary capital.</p> <p>Related terms: risk-bearing capital, target capital</p>
Target capital	<p>The amount of capital to be held by an insurer to meet the quantitative requirements under the SST. The target capital equals the sum of the one-year capital requirement plus the market value margin.</p> <p>Related terms: one-year capital requirement, market value margin</p>
Total balance sheet approach	<p>Principle which states that the determination of the amount of capital an insurer has available and needs for solvency purposes should be based upon all assets and liabilities, as measured in the insurer's regulatory balance sheet (e.g. market-consistently), and how they interact.</p> <p>Related terms: economic balance sheet, market-consistent valuation</p>
Value-at-risk	<p>Value-at-risk is a percentile of a distribution and is used as a (non-coherent) risk measure.</p> <p>Related term: expected shortfall</p>