

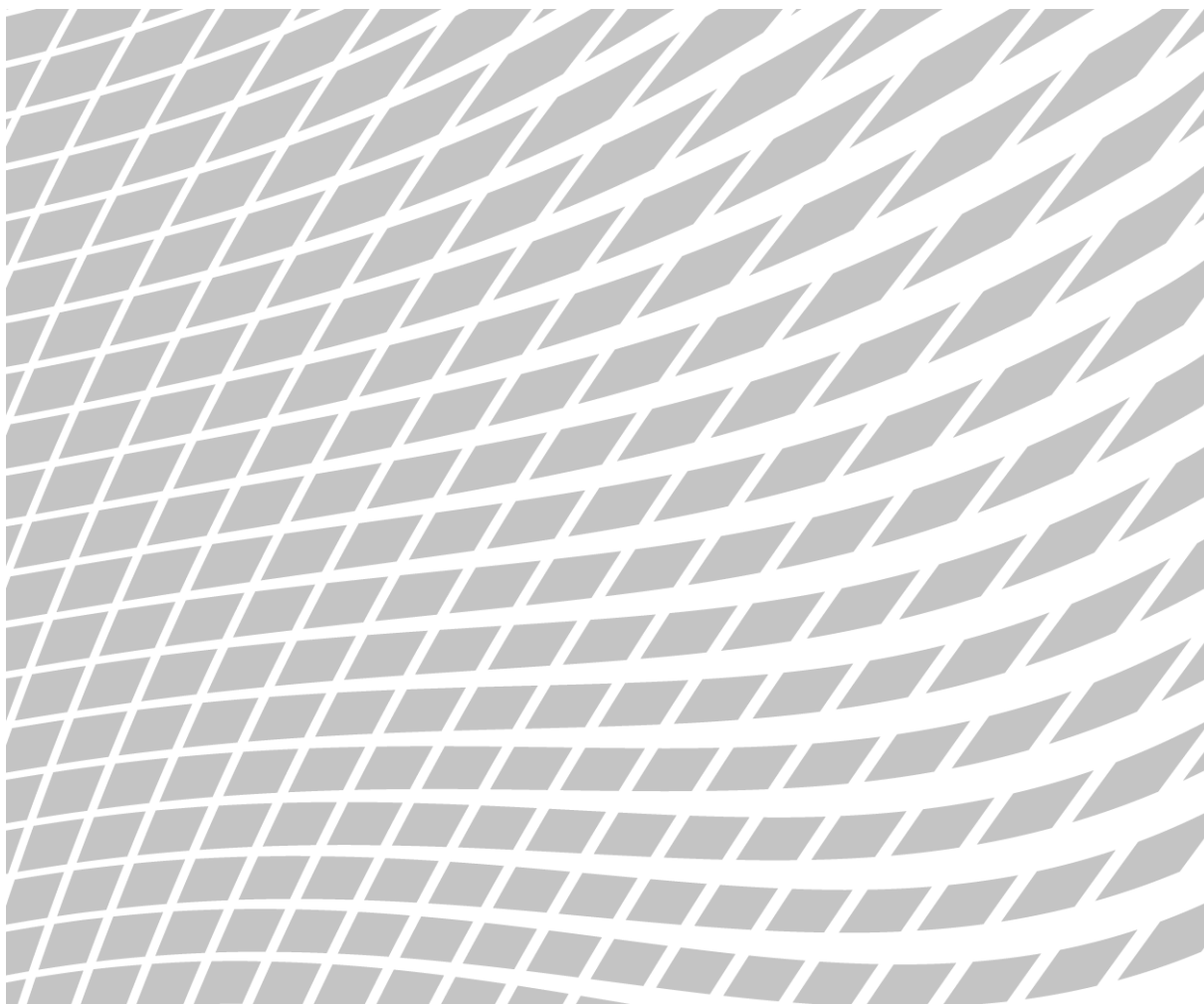
11 December 2015

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## **SST 2015 Survey**

# **FINMA Report on the Swiss Insurance Market**

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## 1 Introduction

This report shows the 2015 SST results and is based on the data of 126 insurers (17 life insurers, 22 health insurers, 56 general insurers and 31 reinsurers); insurance groups were not included. Unless otherwise stated, data actualisation of the 2014 and 2015 SST figures is Q3 2014 and 2015 respectively.

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

Quality and completeness checks for each key indicator were carried out and enhanced in 2015. Where a company's figures did not meet the quality and completeness requirements, the corresponding data were excluded from the analysis. For instance, if the market risk diversification effect was positive, the insurer's market risk figures were excluded from the analysis. Therefore, approximately 5% of the datasets per graph could not be used.

Although FINMA's preliminary checks aim to exclude those datasets with obvious deficiencies, the data that passed this pre-examination test may still be erroneous. Unless otherwise stated, corrections resulting from thorough FINMA reviews were not included in this report.

With effect from 1 January 2013, FINMA decided to introduce temporary adjustments to the SST for the years 2013 to 2015; see FINMA Circular 2013/2 "Temporary Adjustments to the Swiss Solvency Test (SST)". The most important adjustment concerned the yield curve for valuing liabilities. Insurers could opt for a yield curve based on swap rates minus 10 bps as a reference yield curve. This adjustment impacted risk-bearing capital which had increased by the adjustment term. The latter equals the difference between the liabilities valued by means of the risk-free yield curve and those valued by means of the swap-based reference curve (risky yield curve). These adjustments applied solely to the valuation of insurance liabilities (back book); calculation of the target capital remained unaffected. The analyses presented in this report refer to risk-bearing capital which may or may not include the adjustment term, depending on whether an insurer decided to use it or not.

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.

To make the survey meaningful, companies of comparable size were grouped together. For this purpose, the supervisory categories set out in FINMA Newsletter 19 (2011) "Overhaul of FINMA's supervisory approach" were used. All supervised insurers are assigned to categories 2 to 5; categories 1 and 6 are not relevant for insurers.

## 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	17
Health	22	22
General insurance	55	56
Reinsurance	29	31
Total	122	126

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

This report is structured around four sectors: life, health, general insurance and reinsurance. Because the Swiss insurance market is rather heterogeneous, the categories defined in FINMA Newsletter 19 (2011) were used to prevent the high number of smaller companies outweighing the few larger ones, which could lead to a distortion of survey results. Table 2 shows the breakdown of the 126 insurers into sector and category.

	Category 2	Category 3	Category 4	Category 5	Total
Life	2	11	4	0	17
Health	0	6	11	5	22
General insurance	2	9	16	29	56
Reinsurance	1	12	14	4	31
Total	5	38	45	38	126

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

Where necessary, the data of two neighbouring categories were pooled to avoid conclusions being drawn about an insurer's individual risk profile. The figures presented in Table 3 show the aggregated 2015 SST results of all participants. Compared to 2014 SST results in Table 4, the overall solvency situation worsened slightly. For life insurers in particular, adverse effects such as risk-free interest rates were partly offset by other balance sheet positions, e.g. shares and real estate. In total, 20 insurers opted for temporary adjustments (13 life and 7 general insurers).

	Excluding adjustments			Including adjustments		
	RBC	TC	SST ratio	RBC	TC	SST ratio
Life	48,366	33,639	144%	50,173	33,639	149%
Health	9,297	3,484	267%	9,297	3,484	267%
General insurance	76,934	41,749	184%	77,014	41,749	184%
Reinsurance	60,349	27,791	217%	60,349	27,791	217%
Total	194,946	106,663	183%	196,833	106,663	185%

Table 3: Risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2015, broken down by sector.

	Excluding adjustments			Including adjustments		
	RBC	TC	SST ratio	RBC	TC	SST ratio
Life	46,939	32,979	142%	50,440	32,979	153%
Health	9,696	2,867	338%	9,710	2,867	339%
General insurance	72,589	37,799	192%	72,904	37,799	193%
Reinsurance	56,131	24,623	228%	56,131	24,623	228%
Total	185,355	98,267	189%	189,185	98,267	193%

Table 4: Risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2014, broken down by sector.

The 2014 and 2015 SST figures, including FINMA's corrections, are restated in Q4 and Q3 of the corresponding year in Tables 6 and 5. Any changes result from FINMA's corrections and from delayed or updated data delivery.

	Excluding adjustments			Including adjustments		
	RBC	TC	SST ratio	RBC	TC	SST ratio
Life	48,358	34,226	141%	50,165	34,226	147%
Health	9,297	3,484	267%	9,297	3,484	267%
General insurance	76,934	41,883	184%	77,014	41,883	184%
Reinsurance	60,349	27,800	217%	60,349	27,800	217%
Total	194,939	107,393	182%	196,825	107,393	183%

Table 5: Restated risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2015, broken down by sector (including FINMA's corrections).

	Excluding adjustments			Including adjustments		
	RBC	TC	SST ratio	RBC	TC	SST ratio
Life	45,810	34,653	132%	49,315	34,653	142%
Health	9,695	2,868	338%	9,708	2,868	338%
General insurance	73,442	39,651	185%	73,759	39,651	186%
Reinsurance	55,863	24,528	228%	55,863	24,528	228%
Total	184,809	101,701	182%	188,645	101,701	185%

Table 6: Restated risk-bearing capital (RBC, in CHF million), target capital (TC, in CHF million) and SST ratios as of 1 January 2014, broken down by sector (including FINMA's corrections).



## 3 Life

### 3.1 Goals of the analyses

The analyses presented in this section aim to give insight into the following:

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

Two types of graphs are shown:

- waterfall diagrams
- boxplots providing information on the dispersion of the data

To avoid conclusions that can be drawn regarding the individual risk profile of an insurer, the data of two neighbouring categories (e.g. categories 2 and 3 or categories 4 and 5) are pooled. This in case an individual category includes the data of less than five insurer.

#### Assets

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

#### Liabilities

The total liabilities of the market consistent balance sheet are shown as the sum of the different liability types.

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

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

- best estimate liability (BEL)
- market value margin (MVM)
- one-year capital requirement (SCR), which is reached by calculating the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are related 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, we have the following decomposing of assets:

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

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, when relevant, has been included in the supplementary capital. Now CC can be expressed in the following form

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

from which we derive by means of (1) the relation

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

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

### Market risk analysis

Market risk plays a dominant role in an economic, risk-oriented solvency regime. A number of risk factors such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to the market risk. Waterfall and boxplot 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 a case, the total interest rate risk consists of the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into its components arising from the four currencies CHF, EUR, USD and GBP, including diversification.

## Scenarios

For each scenario, we have computed the impact ratio, which is given by the sum of the 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  $c$  will have a negative value, representing a loss.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario equals the *excess capital* (EC), i.e.  $c = -\text{EC}$ . This loss is the maximum loss an insurer can endure while remaining solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). We have used the relation  $\text{RBC} = \text{TC} + \text{EC}$  to obtain the corresponding impact ratio:

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

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

Scenarios exempted from the target capital aggregation are called stress tests and are labelled (ST).

Note that there are scenarios which are relevant only for some, but not all sectors. For instance, the scenario “Default of UVG pool” may be relevant for general insurers, health and reinsurers. If not, the scenario will not be displayed.

## 3.2 Comments on results

Life insurers’ risk-bearing capital remained steady at CHF 50,173 million (-0.5%), while target capital went up slightly to CHF 33,639 million (+2%), resulting in an SST solvency ratio of 149% (down four basis points). It should be pointed out that the individual solvency situation has worsened, as is shown by the decrease in the median of the SST solvency ratios. Adverse effects such as risk-free interest rates were partly offset by other balance sheet positions (e.g. shares and real estate). Life insurers benefited from the adjustment to the interest curve, which added five basis points to the solvency ratio. There was a sharp decline in the adjustment impact (down six basis points on 2014). 2015 is the last year in which insurers can use the temporary adjustments granted for the period 2013-2015.

Capital requirements are largely influenced by market risks (52% of target capital), which are dominated by interest rates and spread risks. The financial crisis scenario demonstrates how susceptible life insurers are to market risks, as many of them would have SST solvency ratios below the threshold of 100%.



### 3.3 Assets

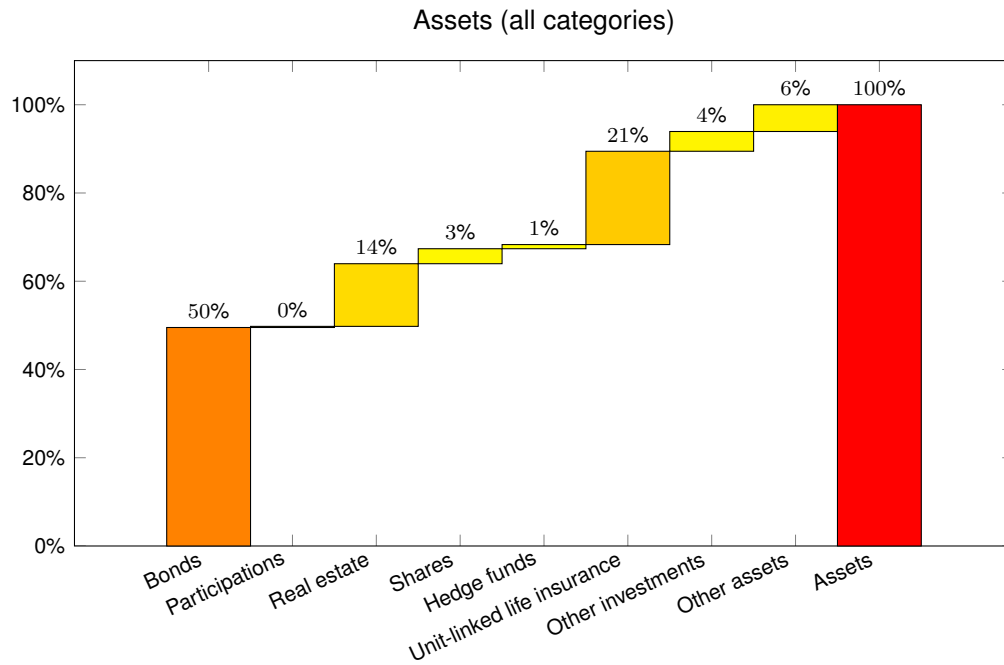


Figure 1a: Life (mean values)

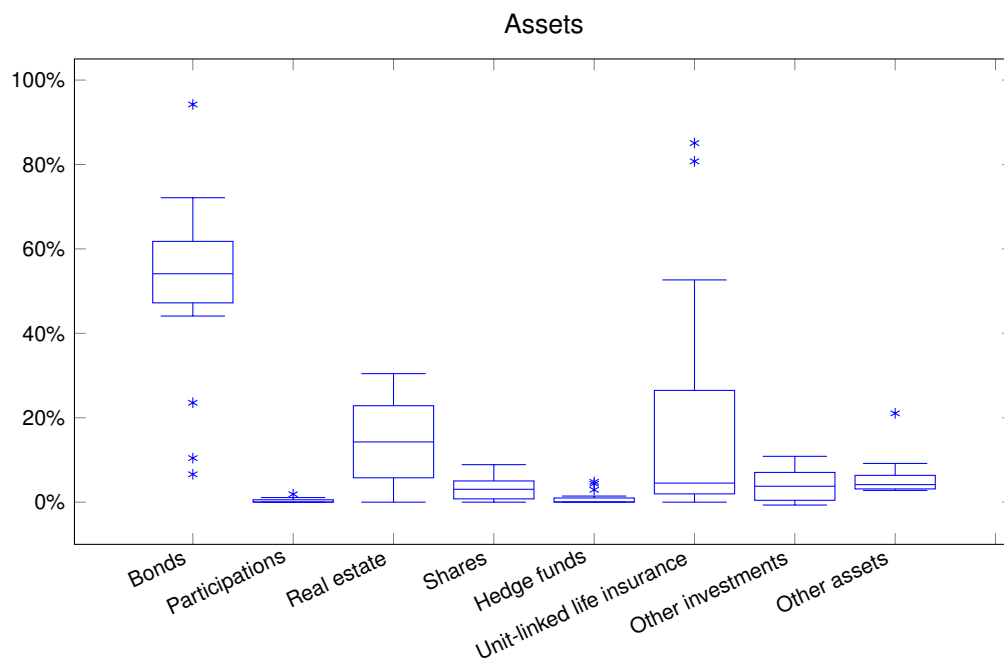


Figure 1b: Life (distribution)

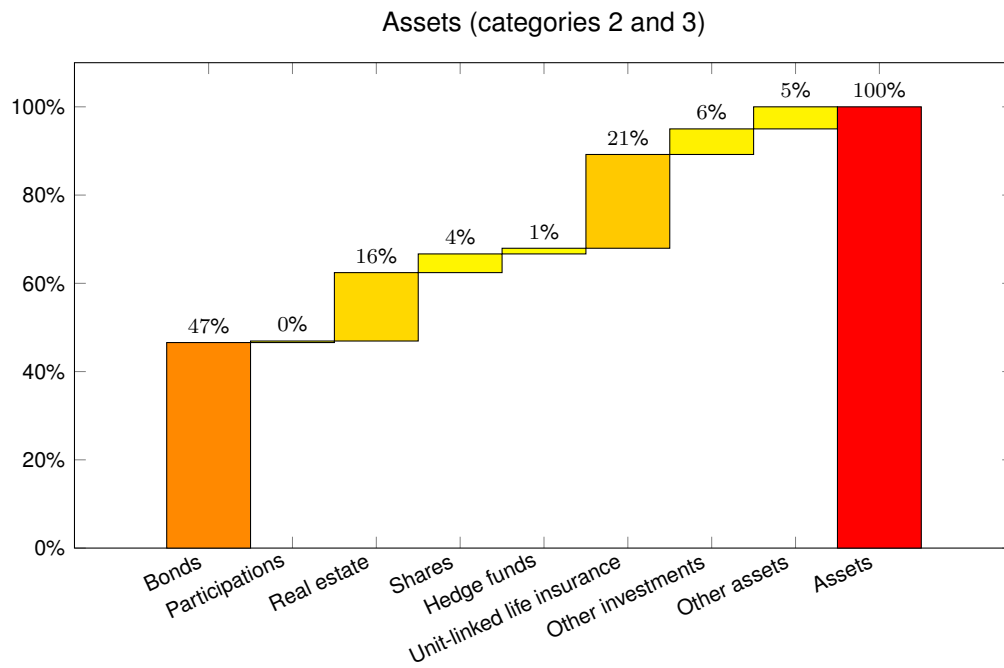


Figure 1c: Life (mean values)

### 3.4 Liabilities

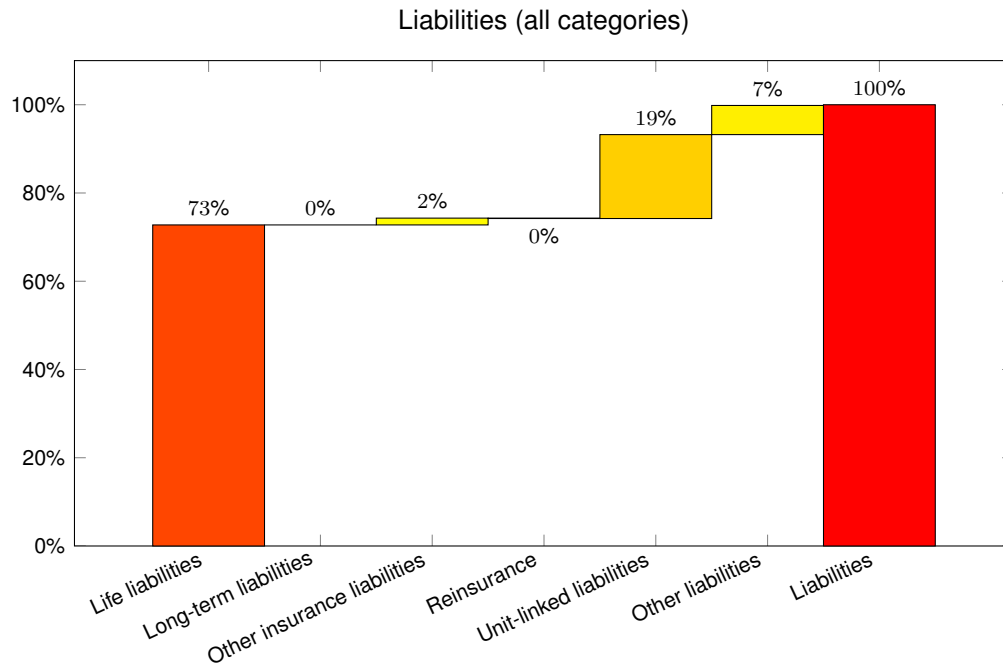


Figure 2a: Life (mean values)

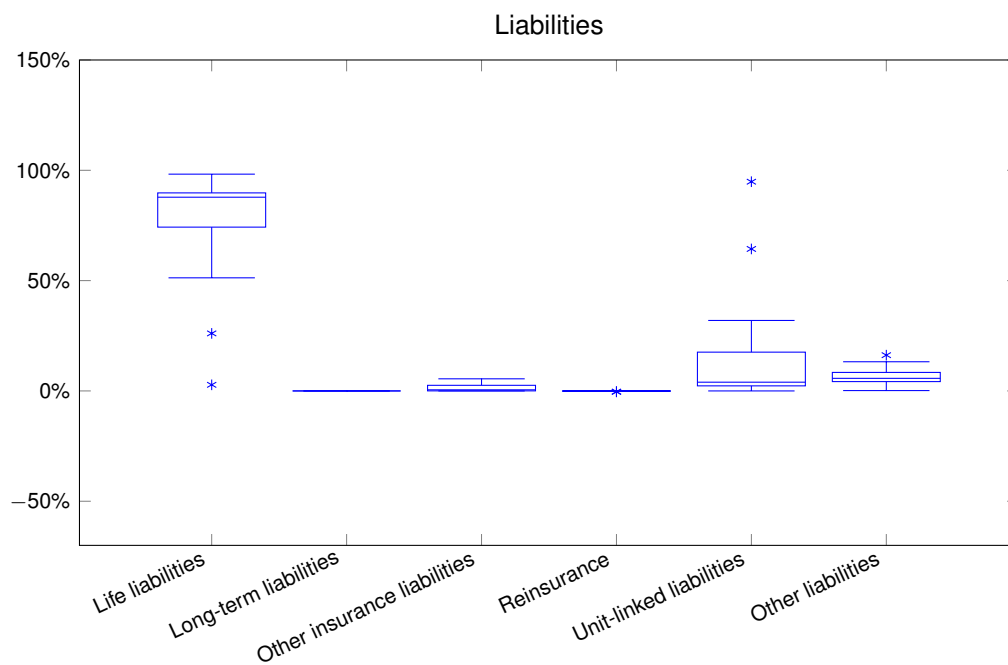


Figure 2b: Life (distribution)

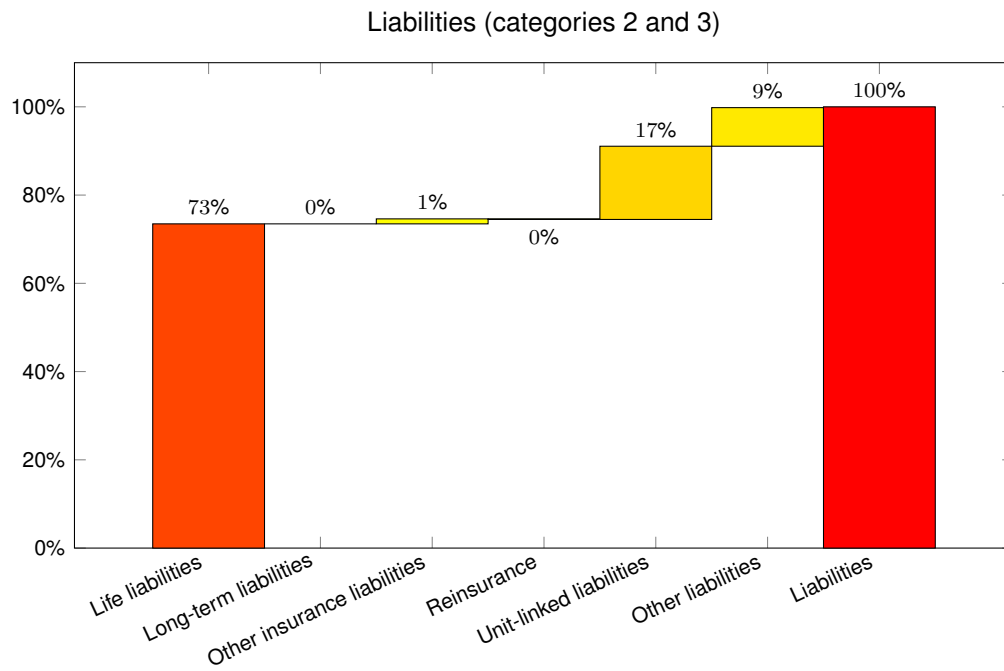


Figure 2c: Life (mean values)

### 3.5 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)

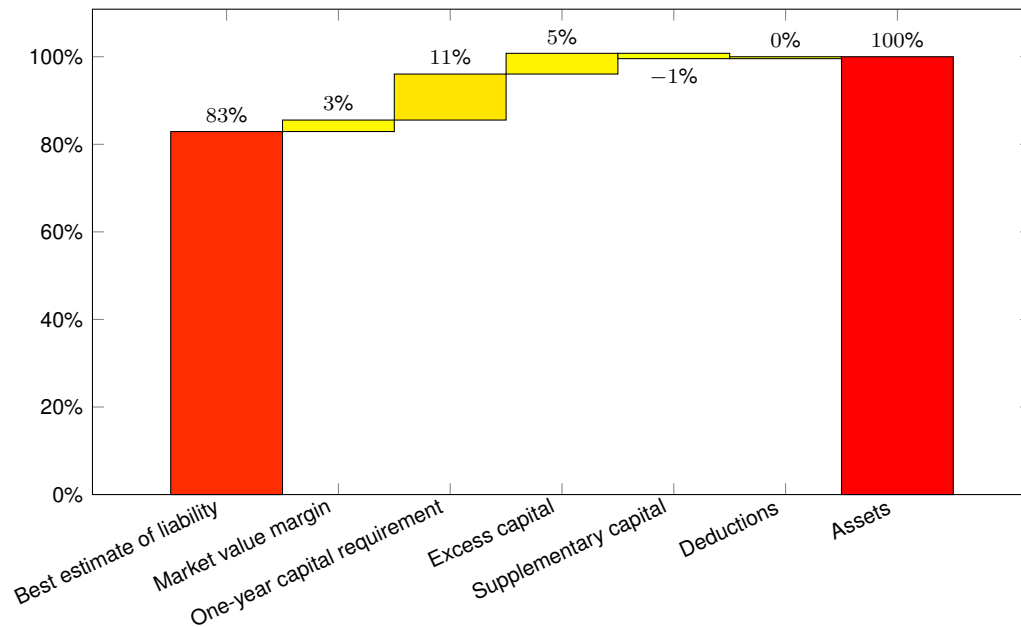


Figure 3a: Life (mean values)

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

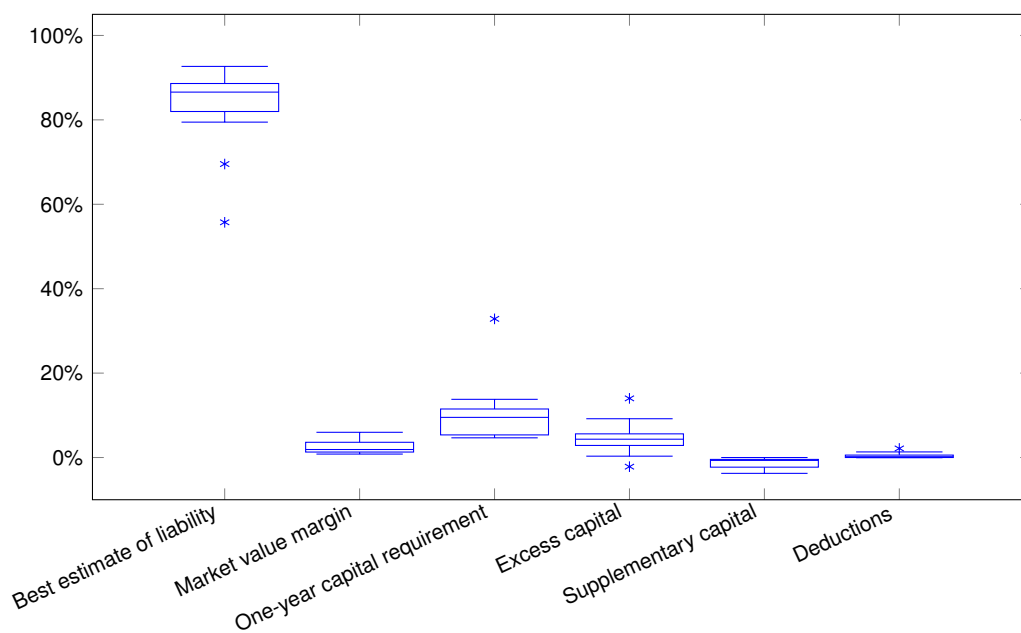


Figure 3b: Life (distribution)



Best estimate of liability and target capital in relation to the balance sheet total (categories 2 and 3)

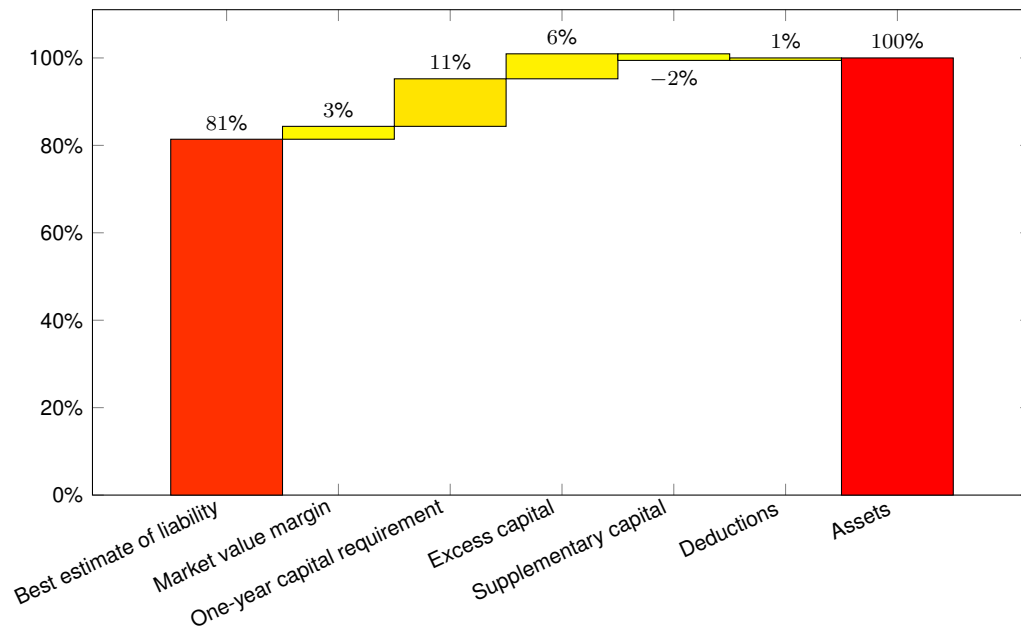


Figure 3c: Life (mean values)

### 3.6 Target capital decomposition

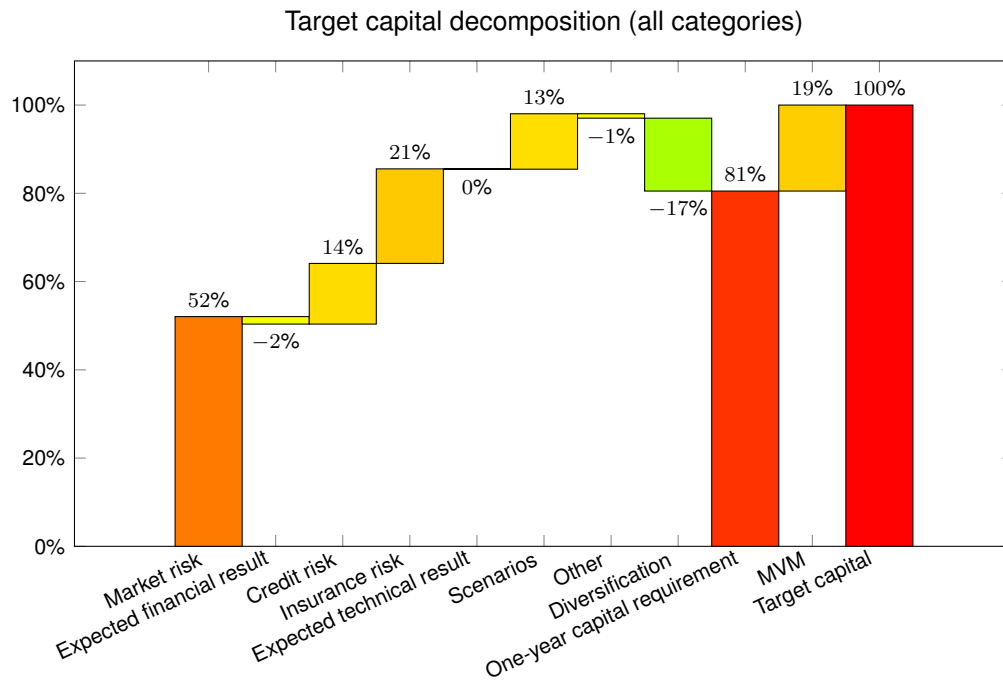


Figure 4a: Life (mean values)

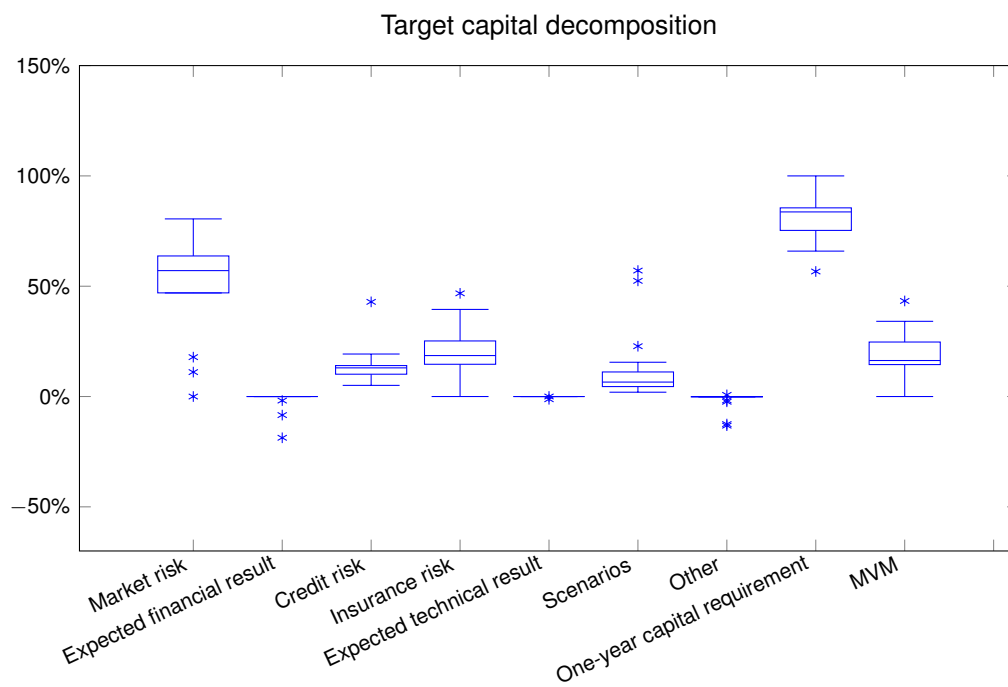


Figure 4b: Life (distribution)

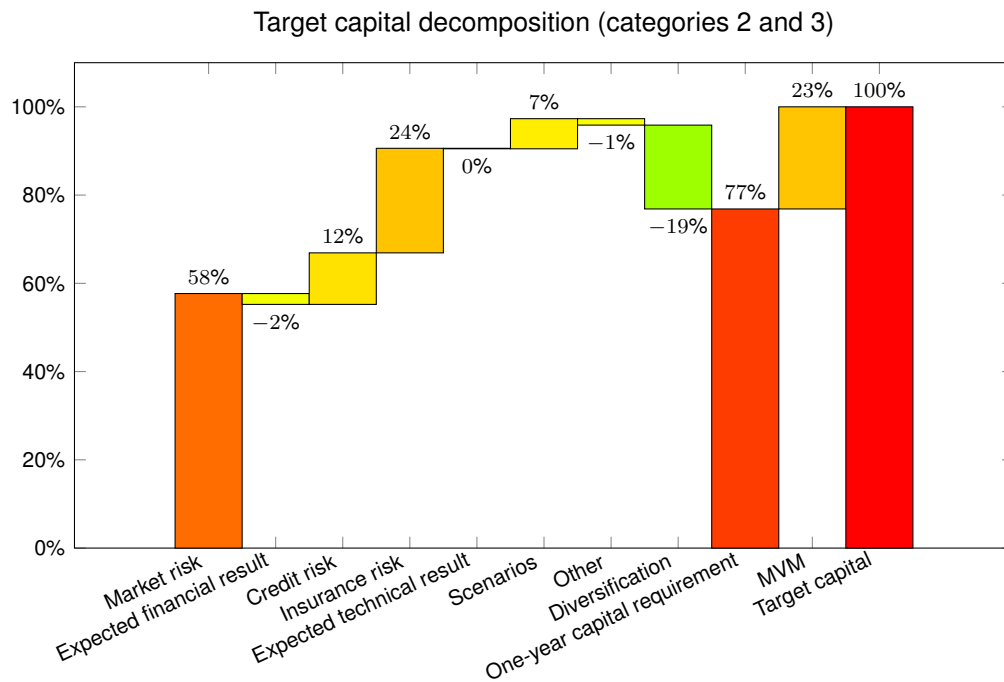


Figure 4c: Life (mean values)

### 3.7 Market risk analysis

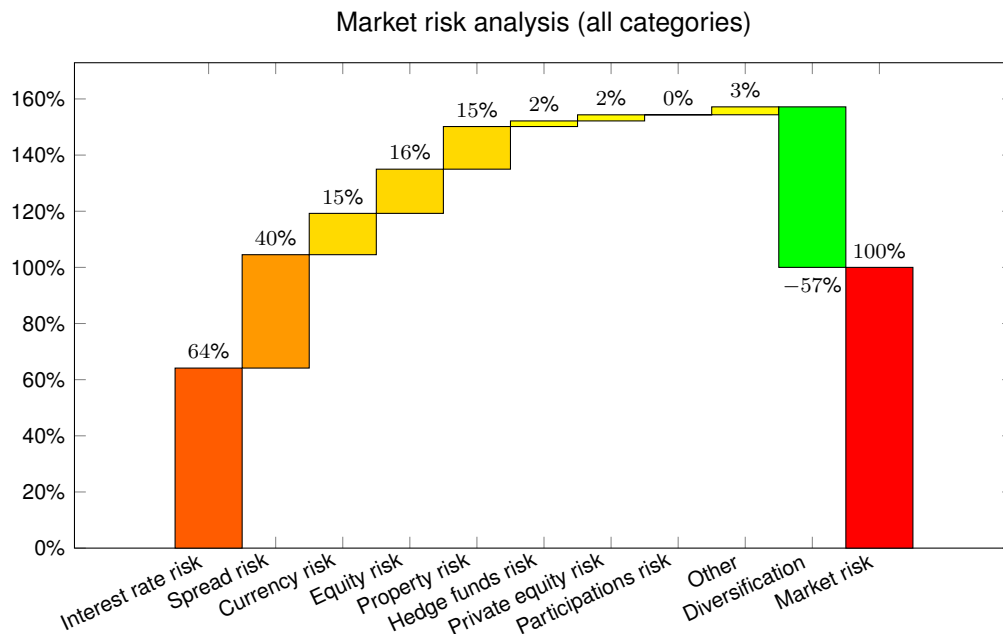


Figure 5a: Life (mean values)

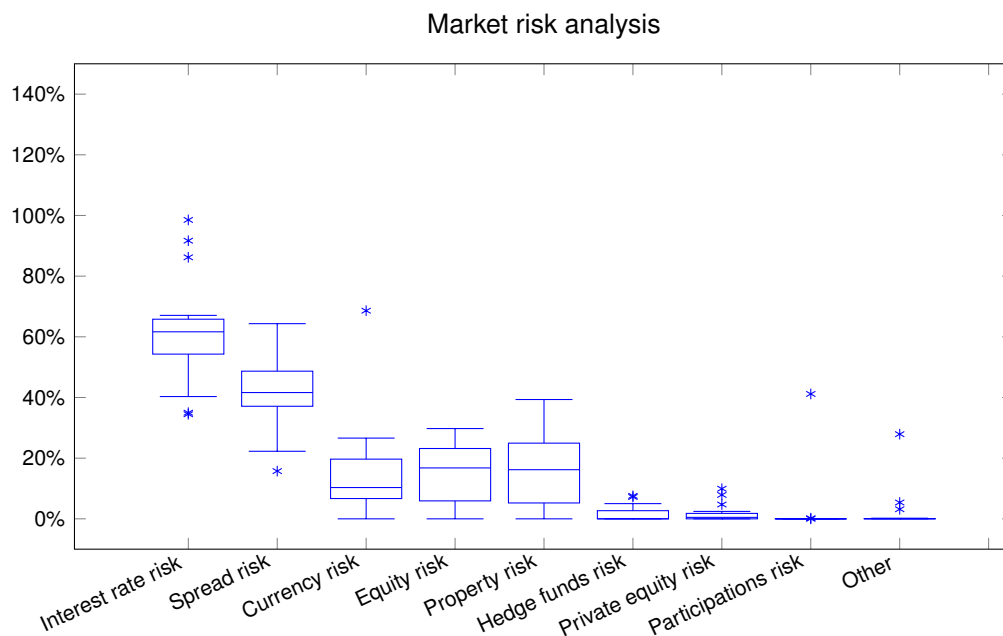


Figure 5b: Life (distribution)

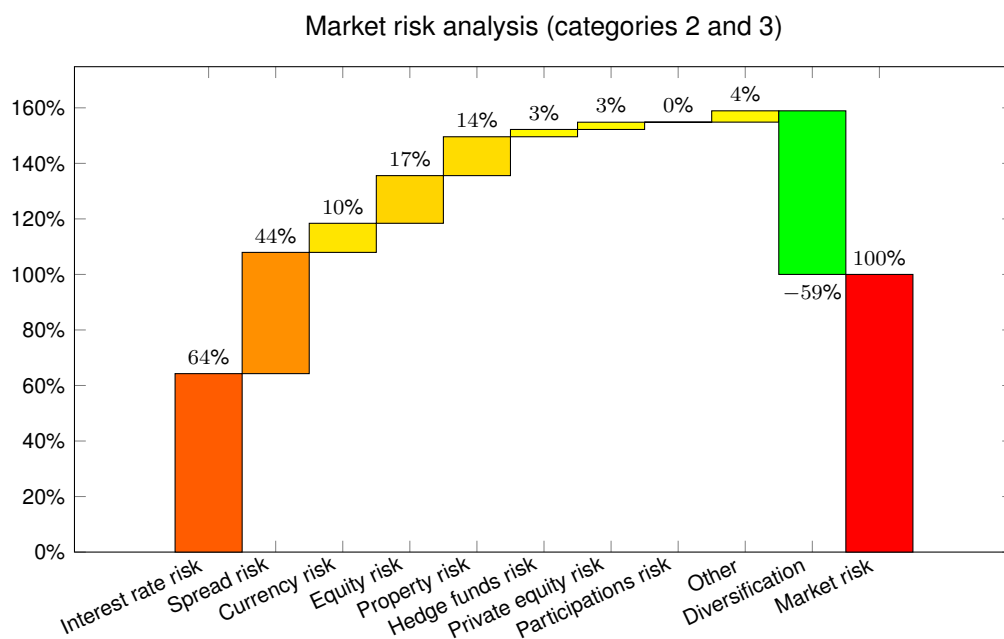


Figure 5c: Life (mean values)

### 3.8 Interest rate analysis

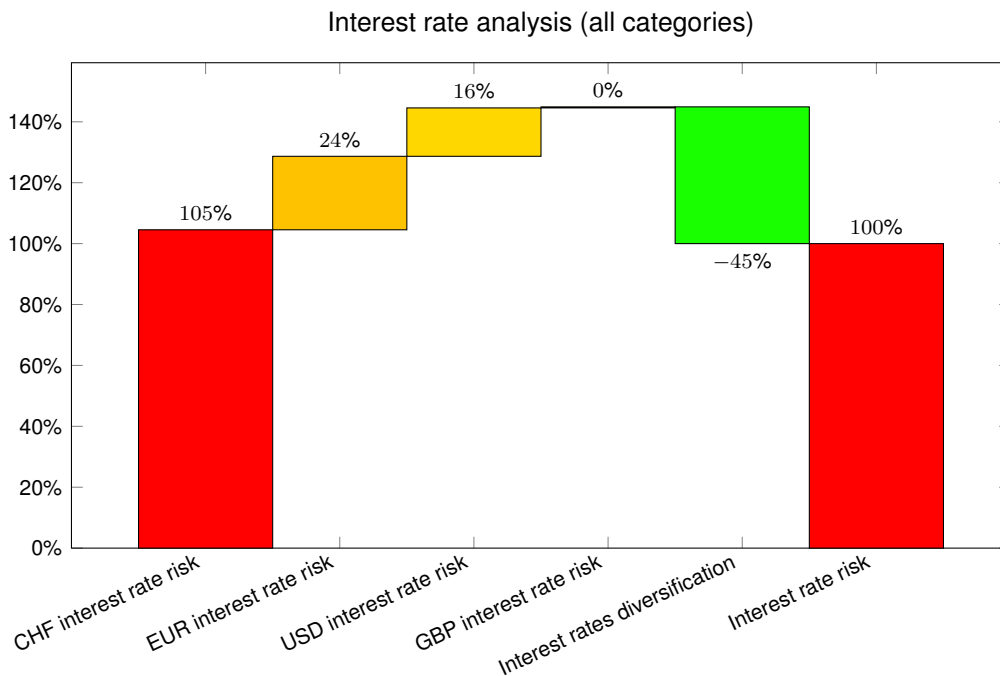


Figure 6a: Life (mean values)

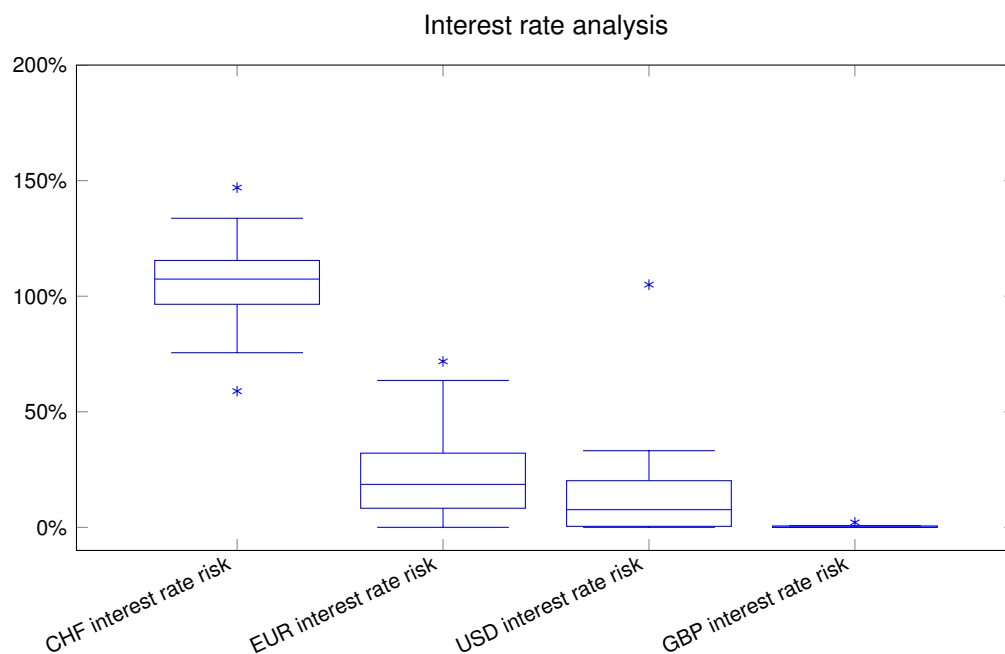


Figure 6b: Life (distribution)

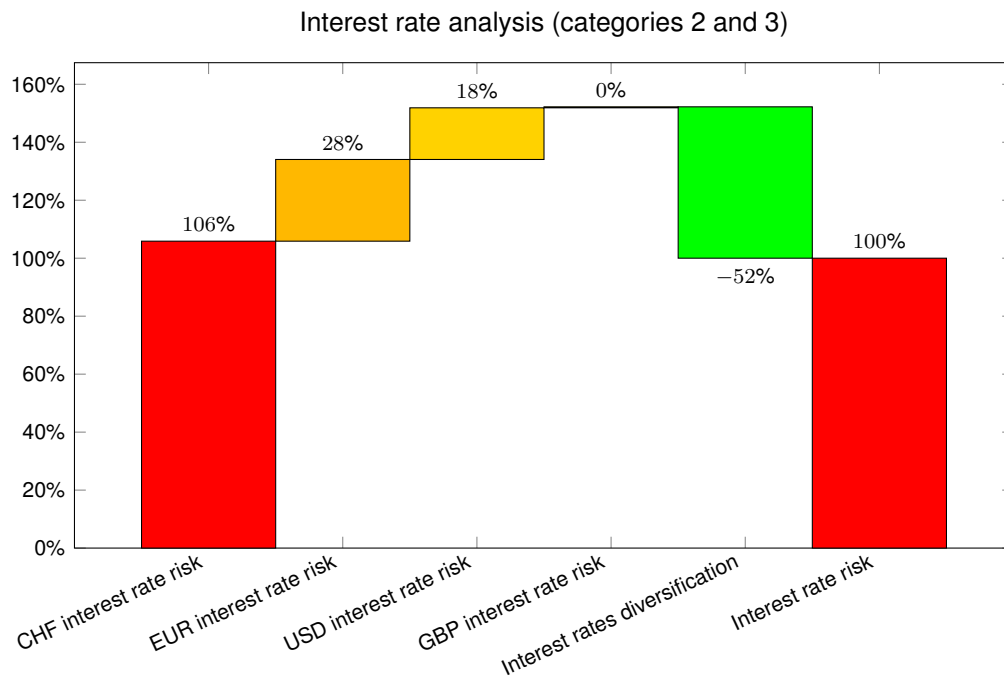


Figure 6c: Life (mean values)

### 3.9 Market and credit risk scenarios

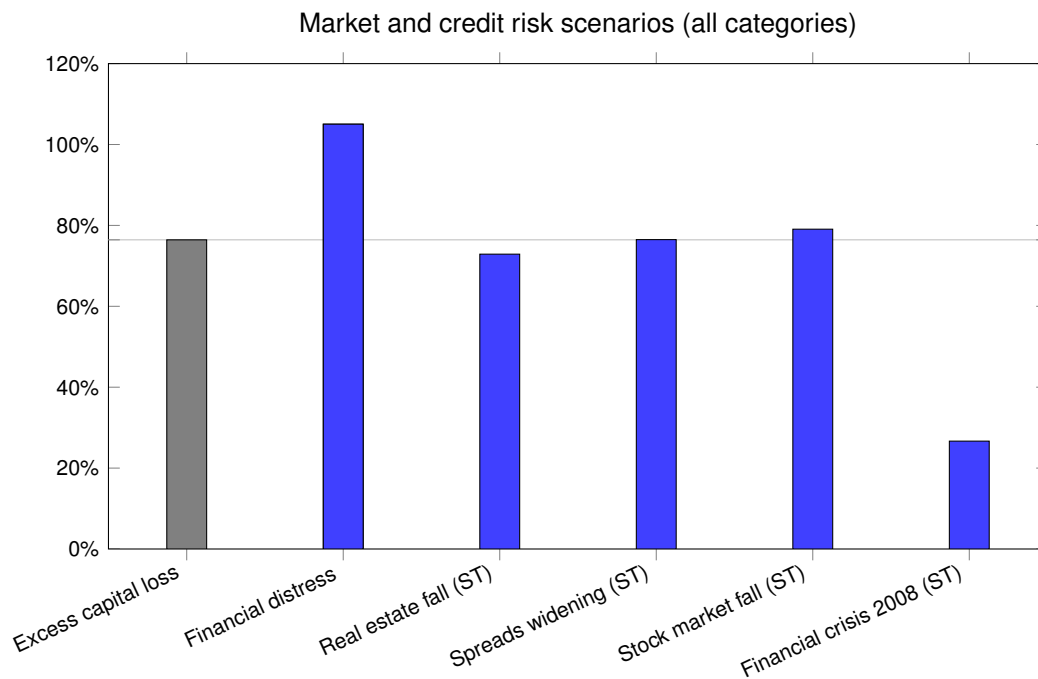


Figure 7a: Life (mean values)

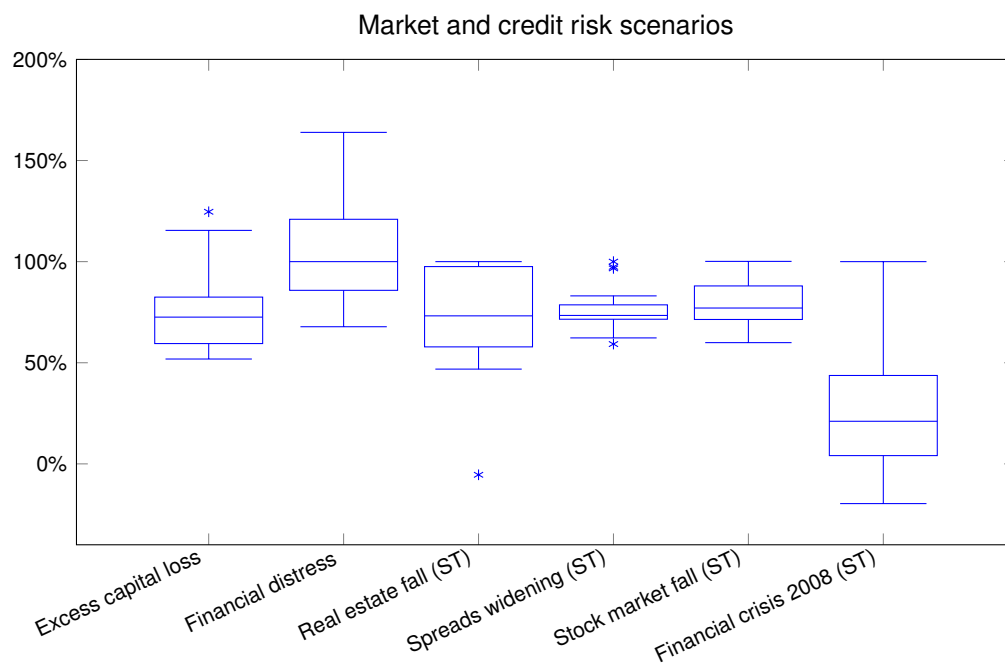


Figure 7b: Life (distribution)



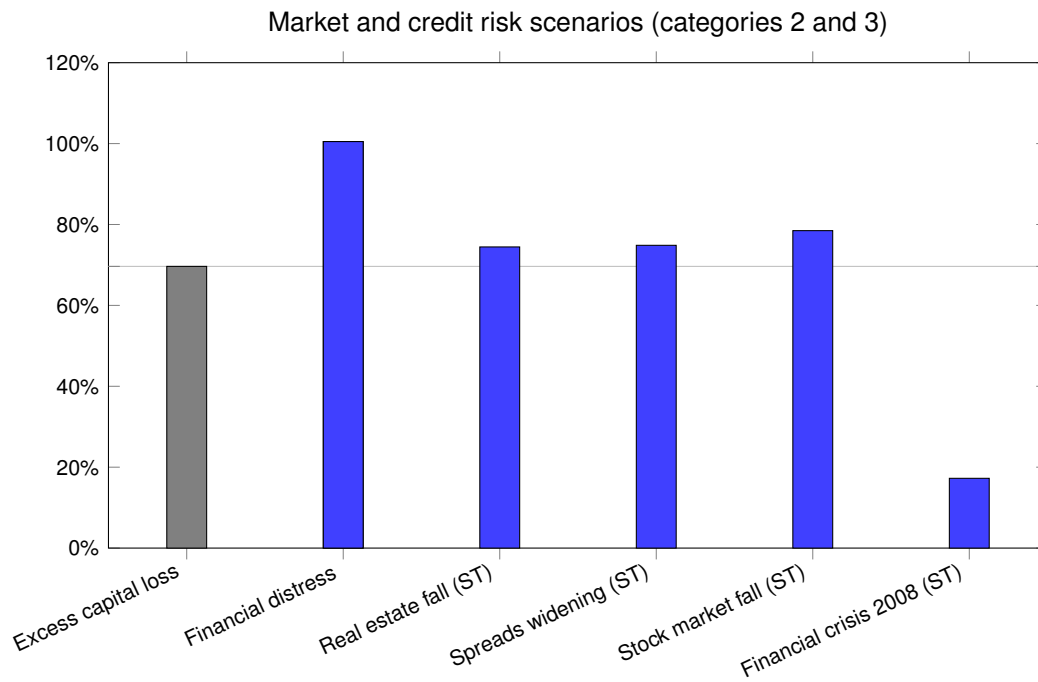


Figure 7c: Life (mean values)

### 3.10 Insurance risk and global scenarios

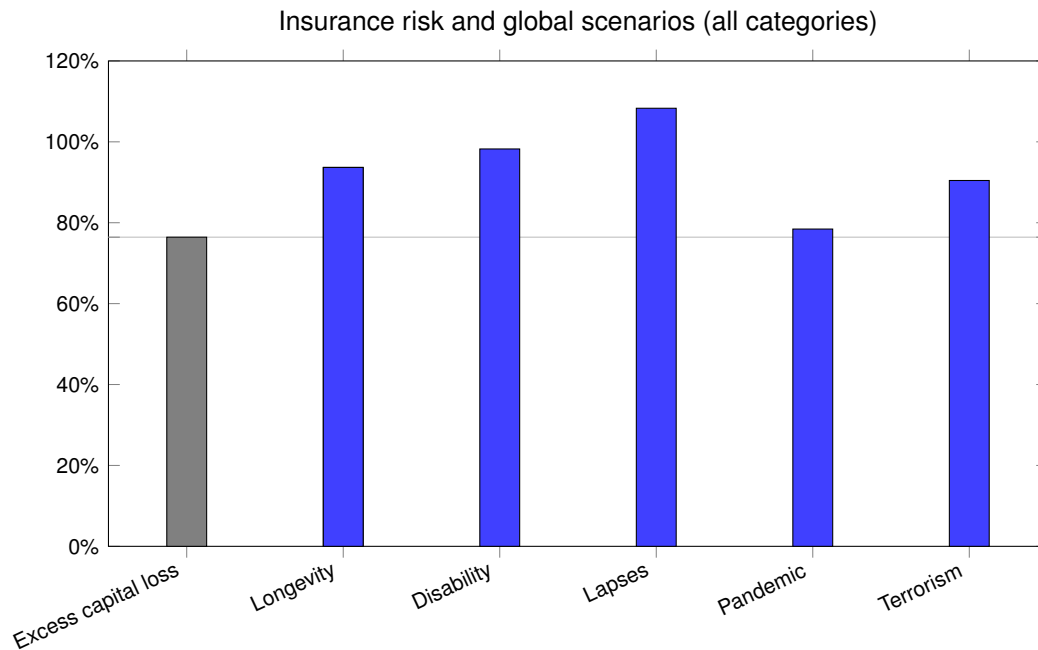


Figure 8a: Life (mean values)

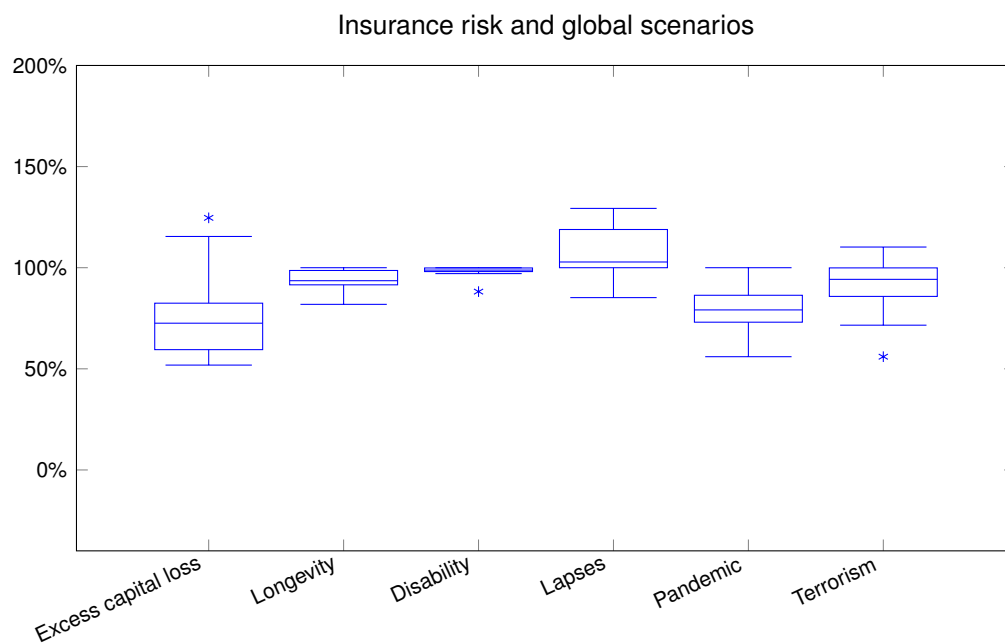


Figure 8b: Life (distribution)

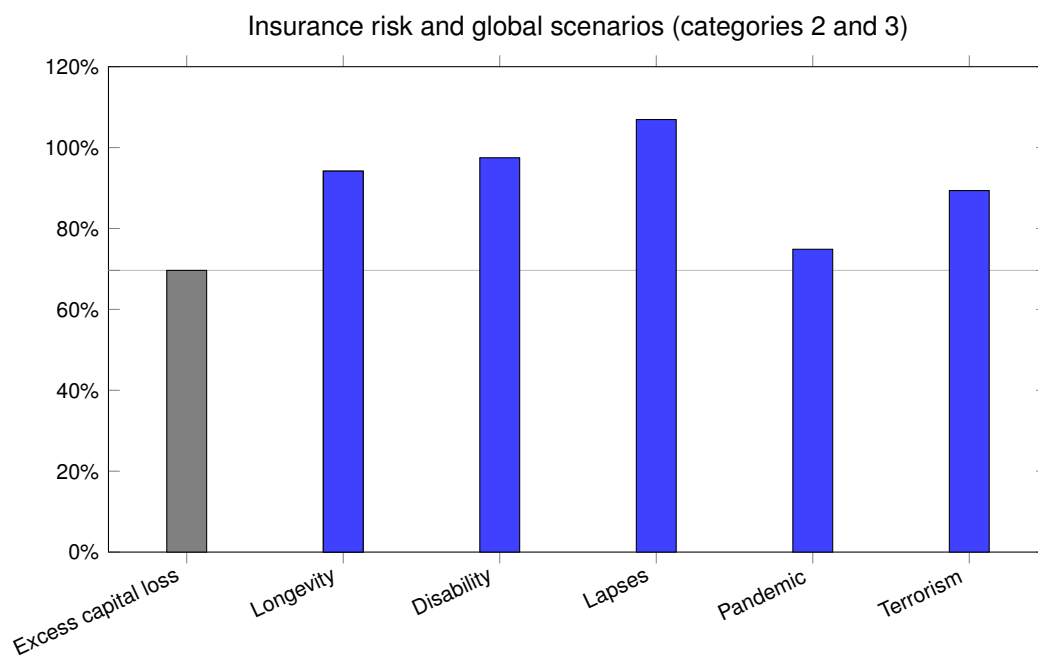


Figure 8c: Life (mean values)

## 4 Health

### 4.1 Goals of the analyses

The analyses presented in this section aim to give insight into the following:

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

Two types of graphs are shown:

- waterfall diagrams
- boxplots providing information on the dispersion of the data

To avoid conclusions that can be drawn regarding the individual risk profile of an insurer, the data of two neighbouring categories (e.g. categories 2 and 3 or categories 4 and 5) are pooled. This in case an individual category includes the data of less than five insurer.

#### Assets

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

#### Liabilities

The total liabilities of the market consistent balance sheet are shown as the sum of the different liability types.

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

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

- best estimate liability (BEL)
- market value margin (MVM)
- one-year capital requirement (SCR), which is reached by calculating the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are related 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, we have the following decomposing of assets:

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

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, when relevant, has been included in the supplementary capital. Now CC can be expressed in the following form

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

from which we derive by means of (1) the relation

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

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

### Market risk analysis

Market risk plays a dominant role in an economic, risk-oriented solvency regime. A number of risk factors such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to the market risk. Waterfall and boxplot 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 a case, the total interest rate risk consists of the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into its components arising from the four currencies CHF, EUR, USD and GBP, including diversification.

## Scenarios

For each scenario, we have computed the impact ratio, which is given by the sum of the 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  $c$  will have a negative value, representing a loss.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario equals the *excess capital* (EC), i.e.  $c = -\text{EC}$ . This loss is the maximum loss an insurer can endure while remaining solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). We have used the relation  $\text{RBC} = \text{TC} + \text{EC}$  to obtain the corresponding impact ratio:

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

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

Scenarios exempted from the target capital aggregation are called stress tests and are labelled (ST).

Note that there are scenarios which are relevant only for some, but not all sectors. For instance, the scenario “Default of UVG pool” may be relevant for general insurers, health and reinsurers. If not, the scenario will not be displayed.

## 4.2 Comments on results

Only some companies experienced a drop in risk-bearing capital, which nonetheless fell by 4.3% to CHF 9,297 million. Most companies experienced a substantial increase in target capital, which rose to CHF 3,484 million (up 21.5%). This rise is mainly due to higher risk-bearing capital for a number of companies, which increased the assets under risk, as well as to a decrease in the technical result expected for 2015.

Both the evolution of risk-bearing capital and that of target capital resulted in a significant decline in the SST ratio, which dropped to 267% (down 72 basis points).



### 4.3 Assets

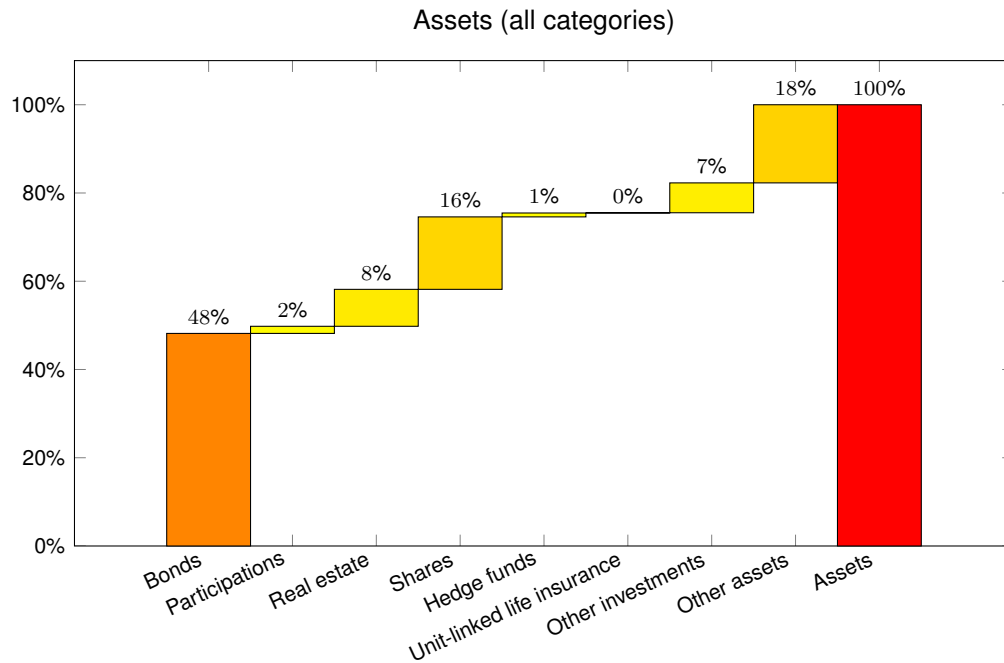


Figure 9a: Health (mean values)

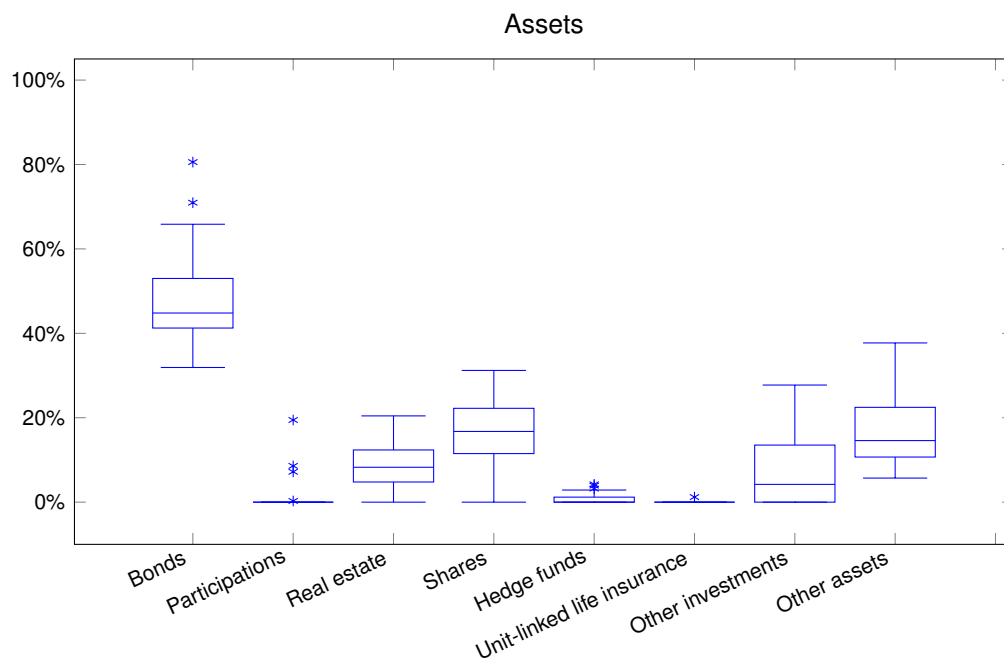


Figure 9b: Health (distribution)



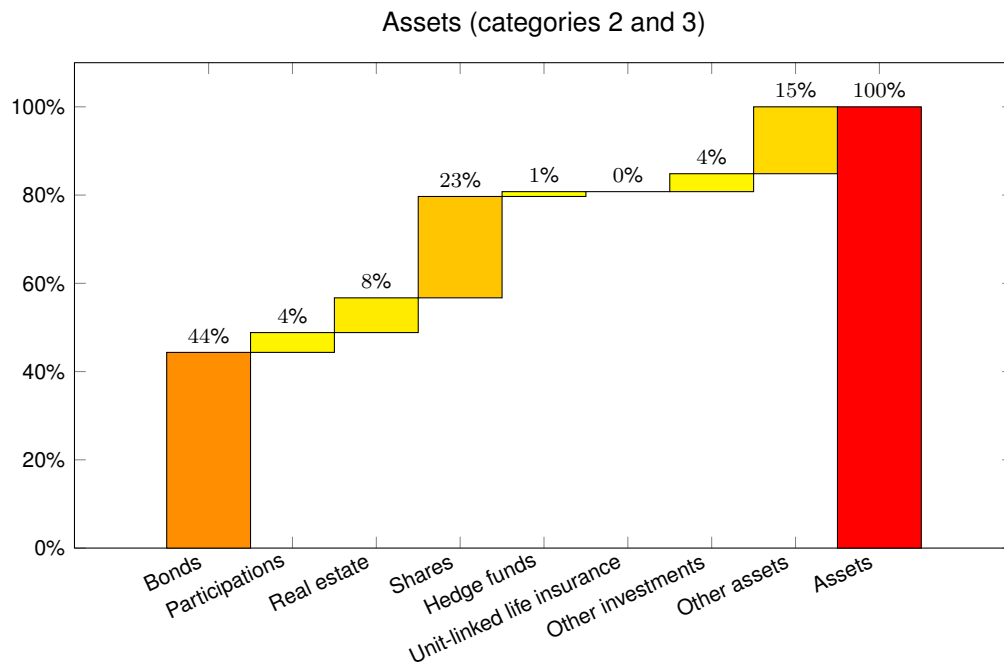


Figure 9c: Health (mean values)

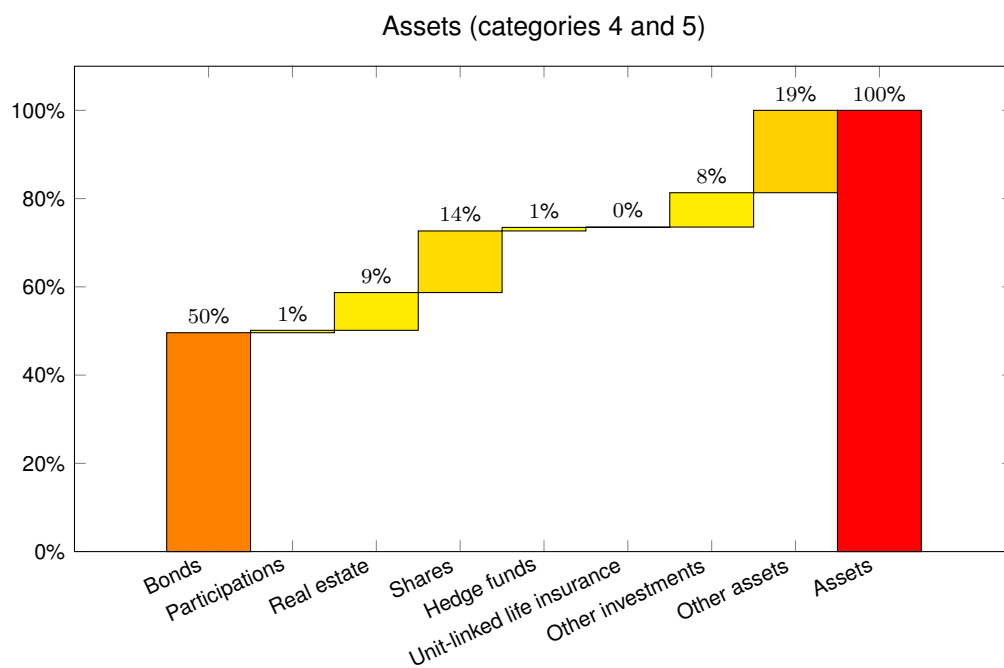


Figure 9d: Health (mean values)

## 4.4 Liabilities

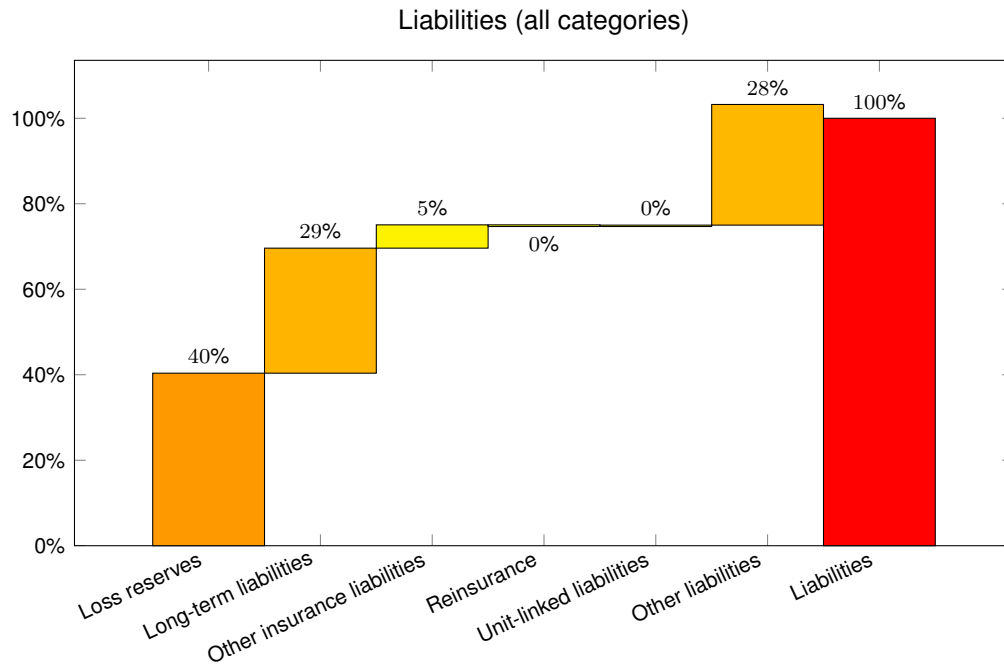


Figure 10a: Health (mean values)

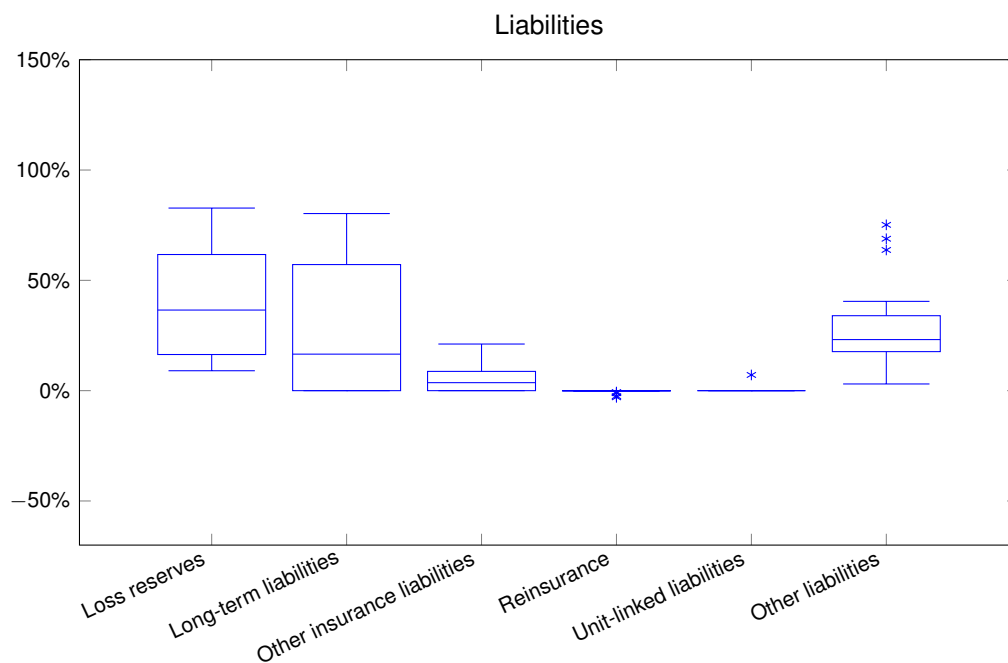


Figure 10b: Health (distribution)

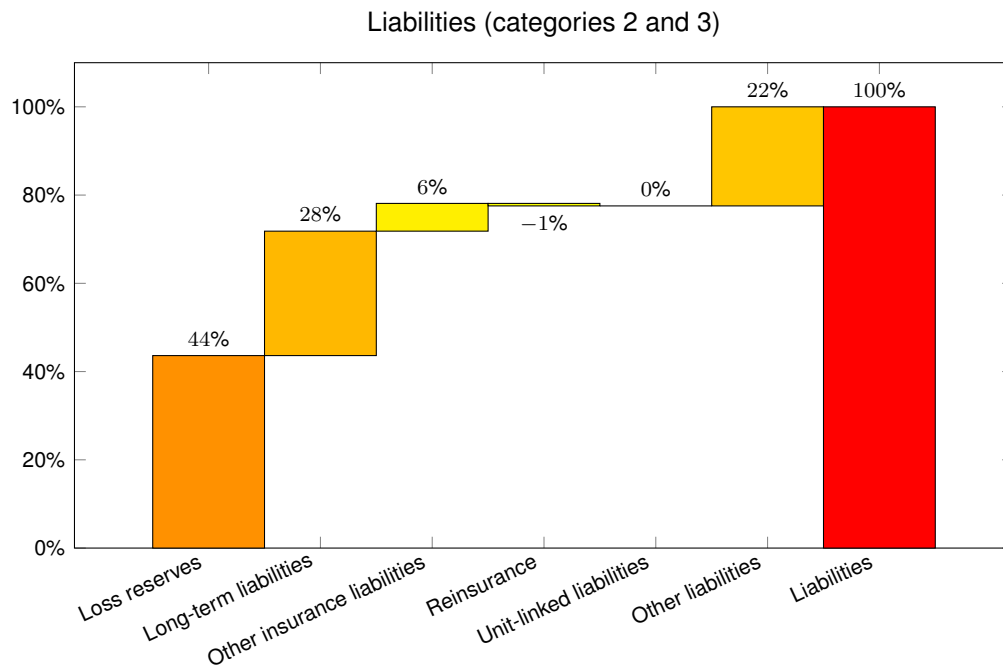


Figure 10c: Health (mean values)

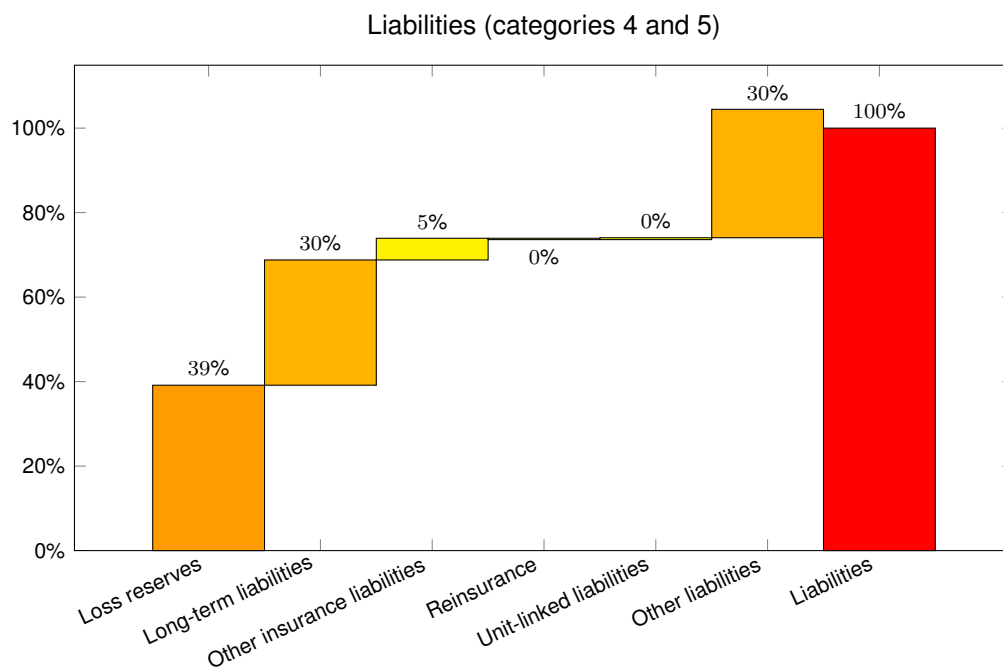


Figure 10d: Health (mean values)

## 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)

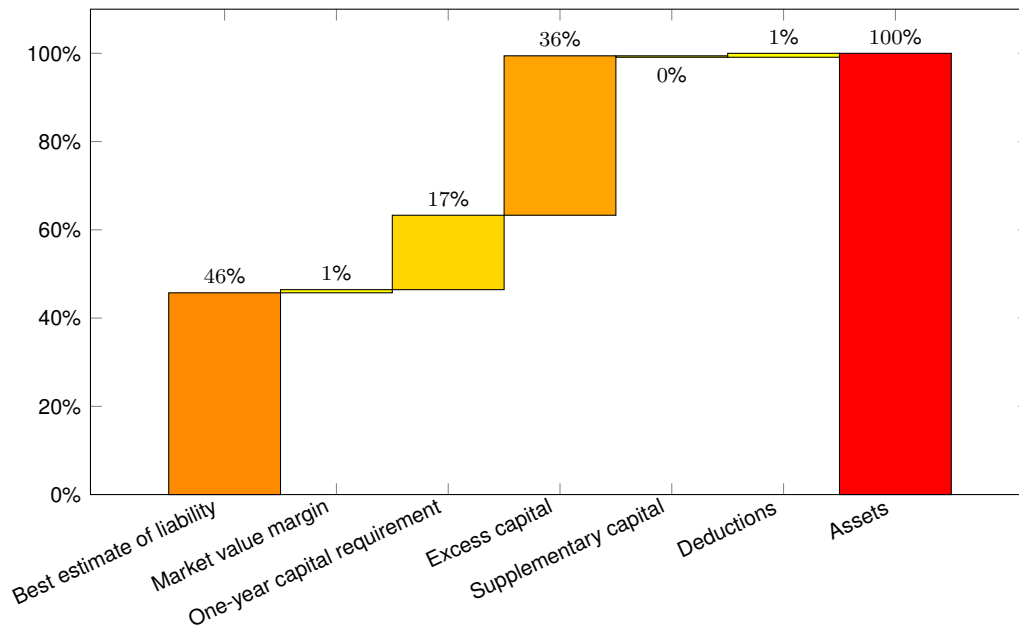


Figure 11a: Health (mean values)

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

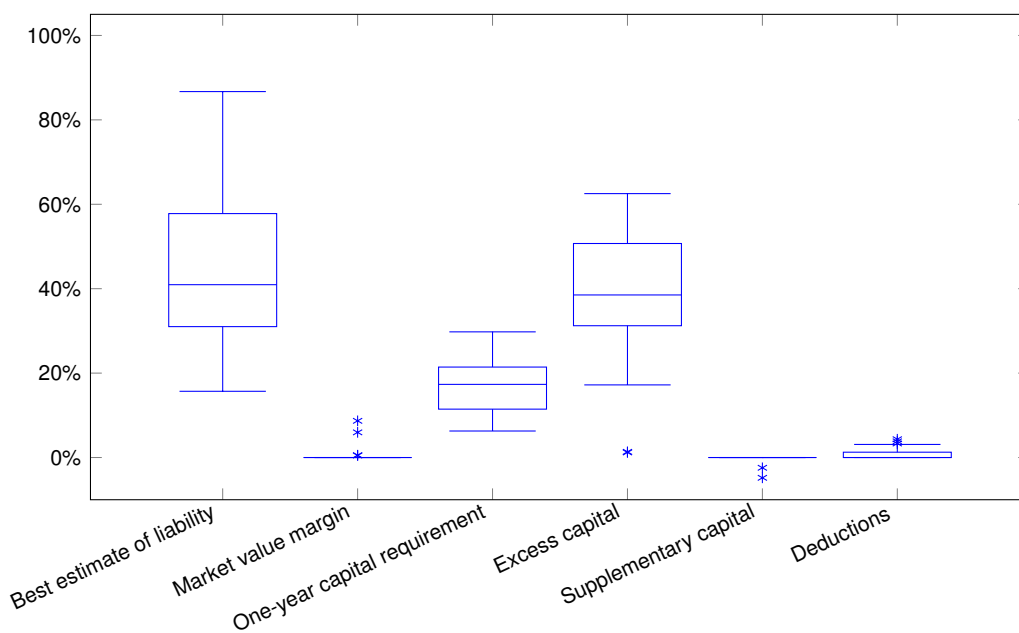


Figure 11b: Health (distribution)

Best estimate of liability and target capital in relation to the balance sheet total (categories 2 and 3)

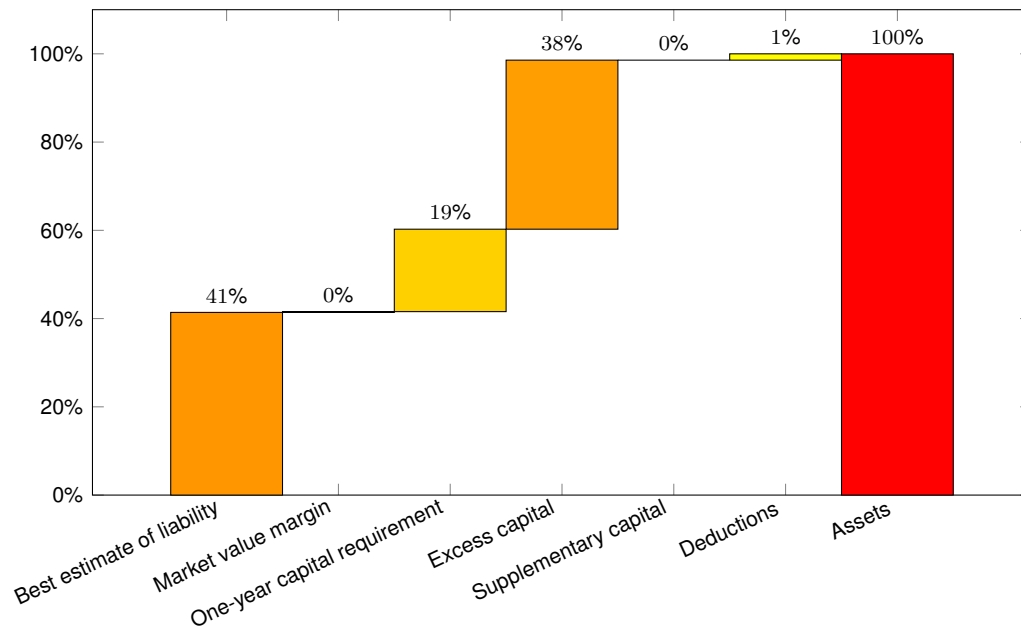


Figure 11c: Health (mean values)

Best estimate of liability and target capital in relation to the balance sheet total (categories 4 and 5)

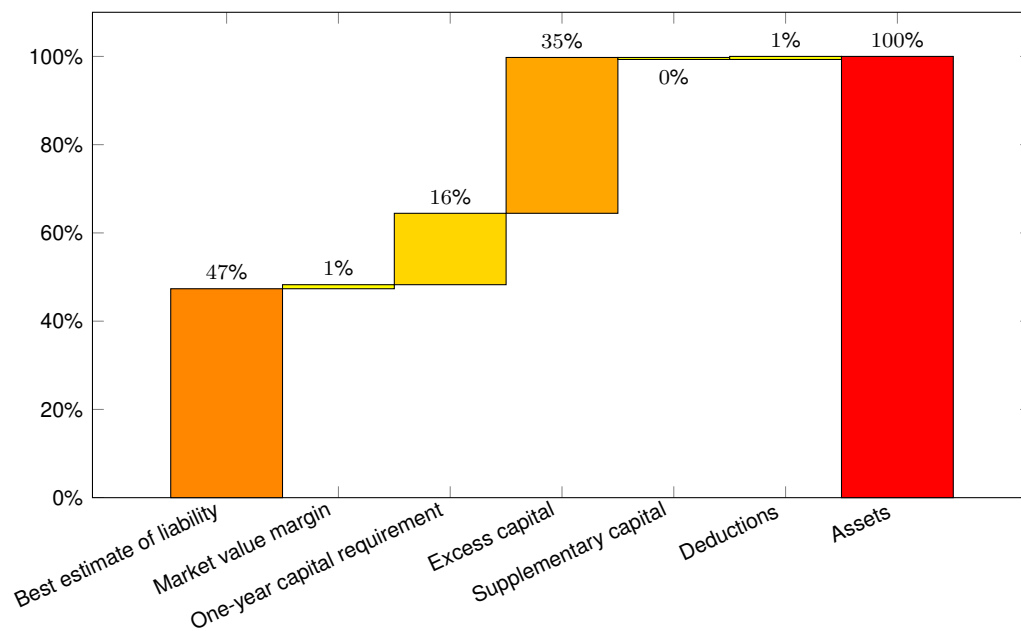


Figure 11d: Health (mean values)

## 4.6 Target capital decomposition

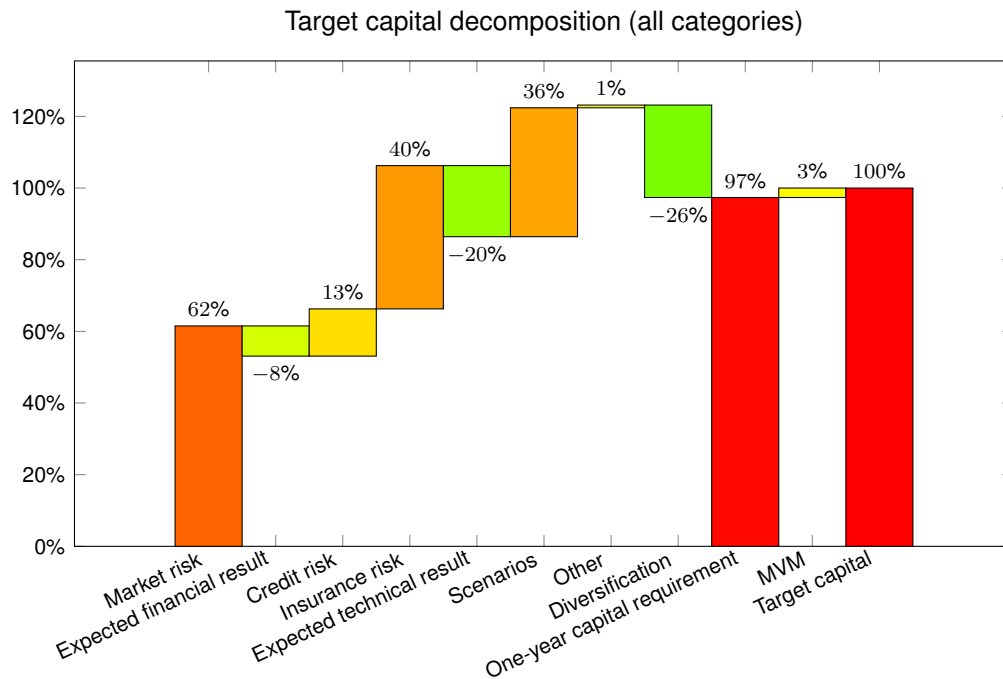


Figure 12a: Health (mean values)

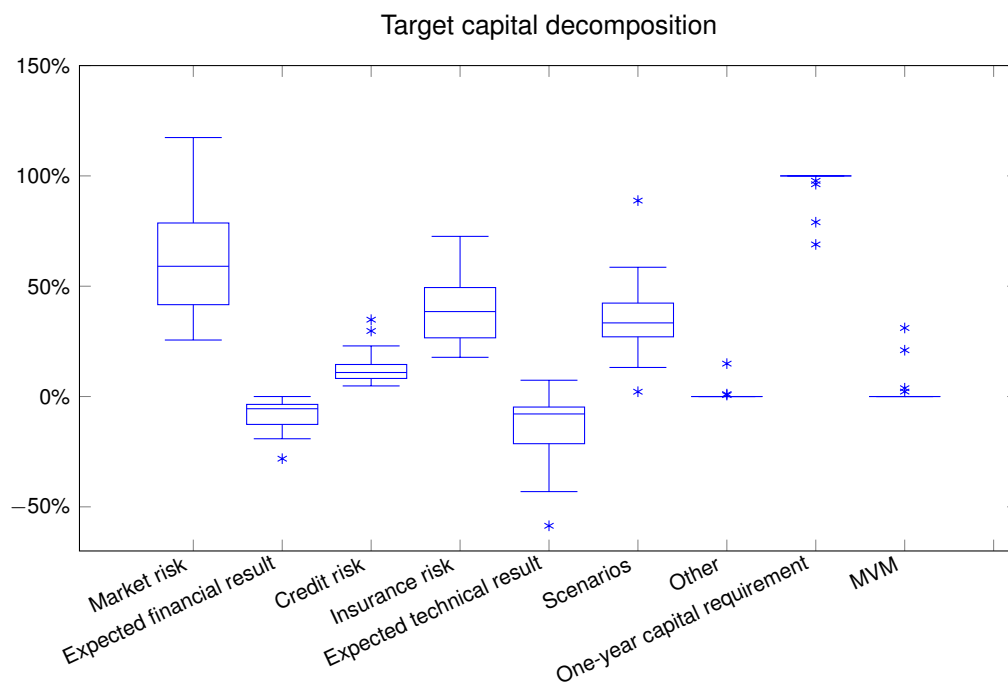


Figure 12b: Health (distribution)

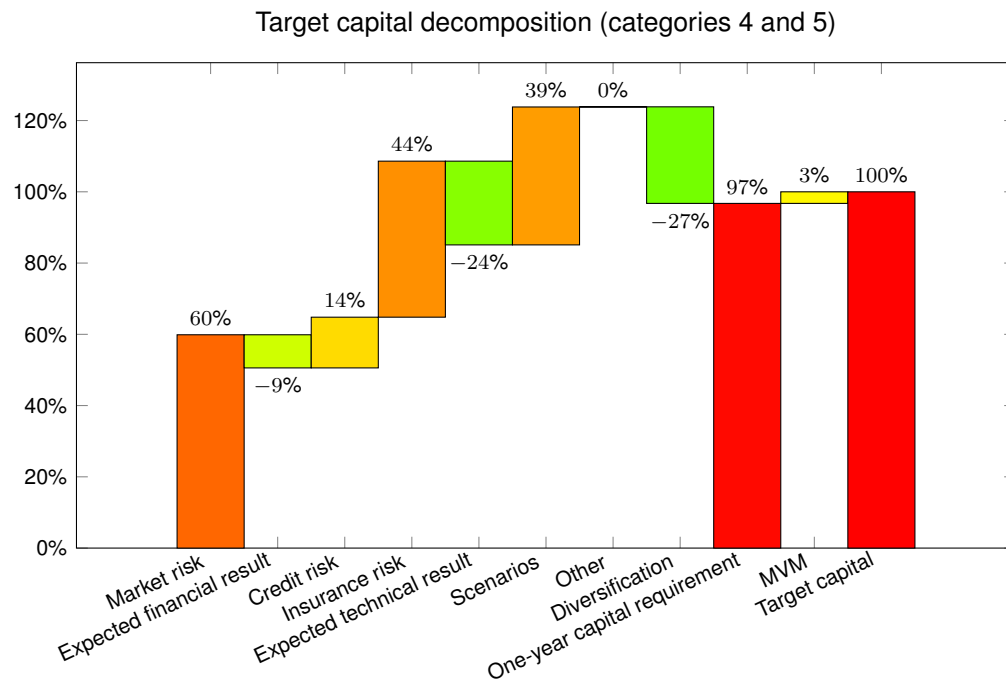


Figure 12c: Health (mean values)

## 4.7 Market risk analysis

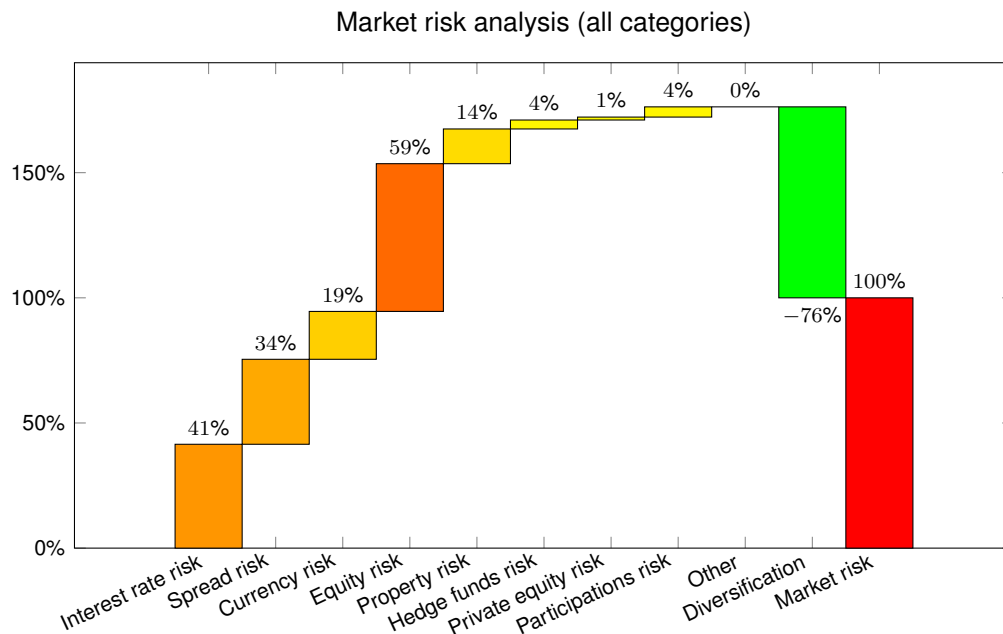


Figure 13a: Health (mean values)

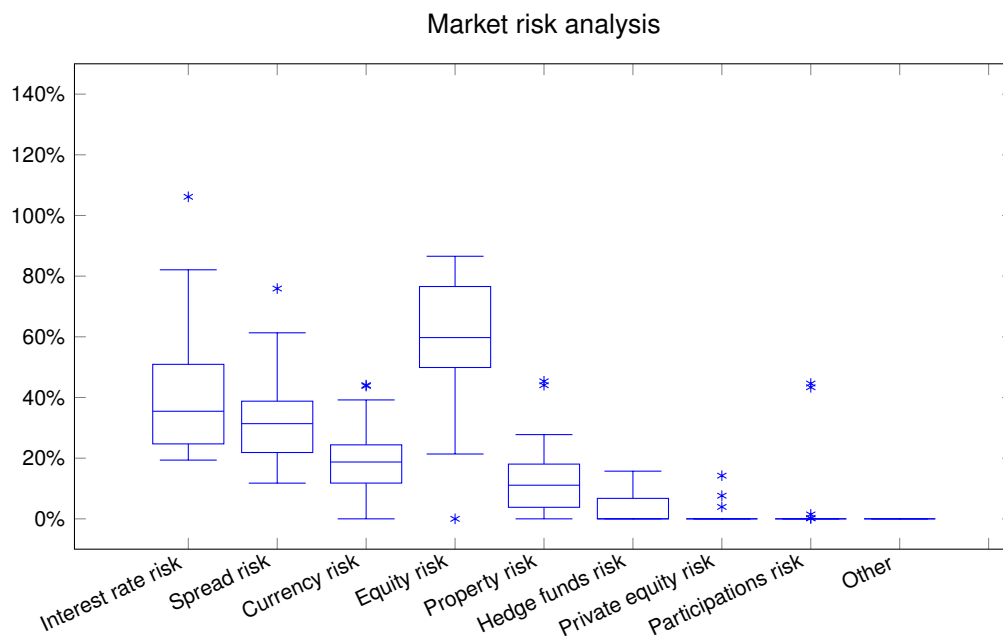


Figure 13b: Health (distribution)



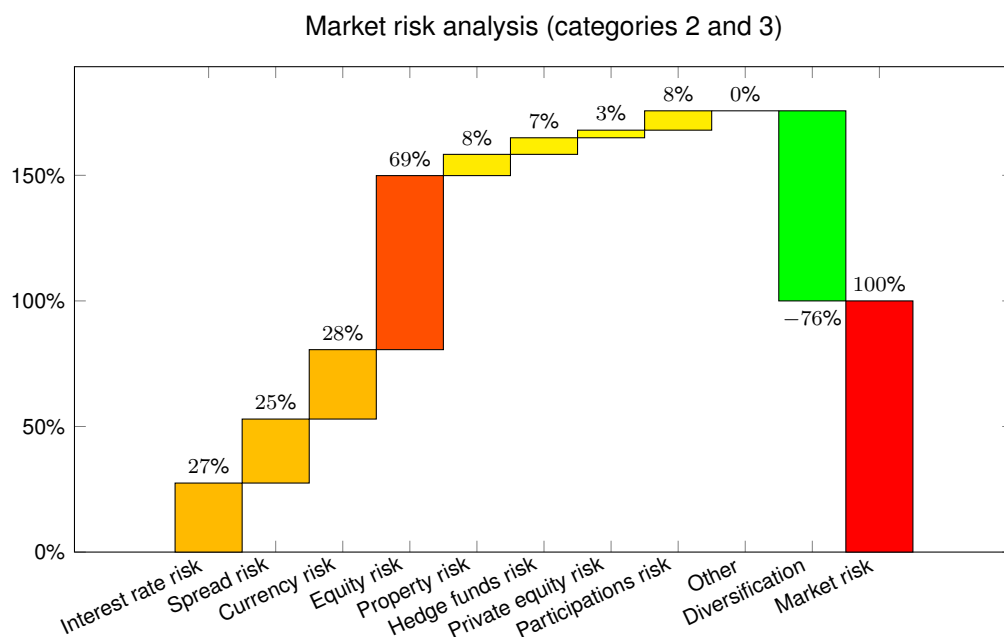


Figure 13c: Health (mean values)

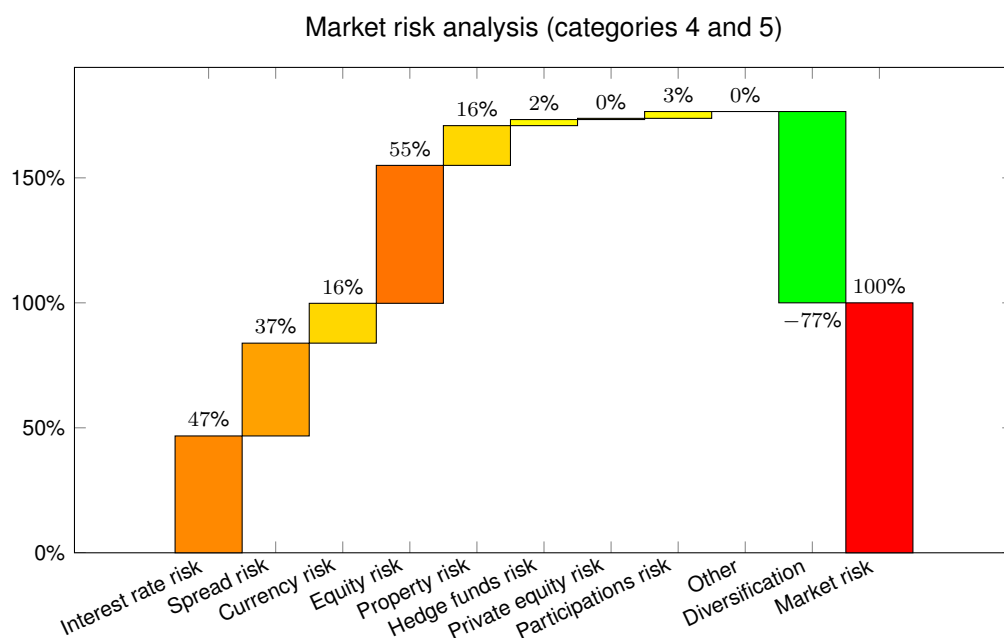


Figure 13d: Health (mean values)

## 4.8 Interest rate analysis

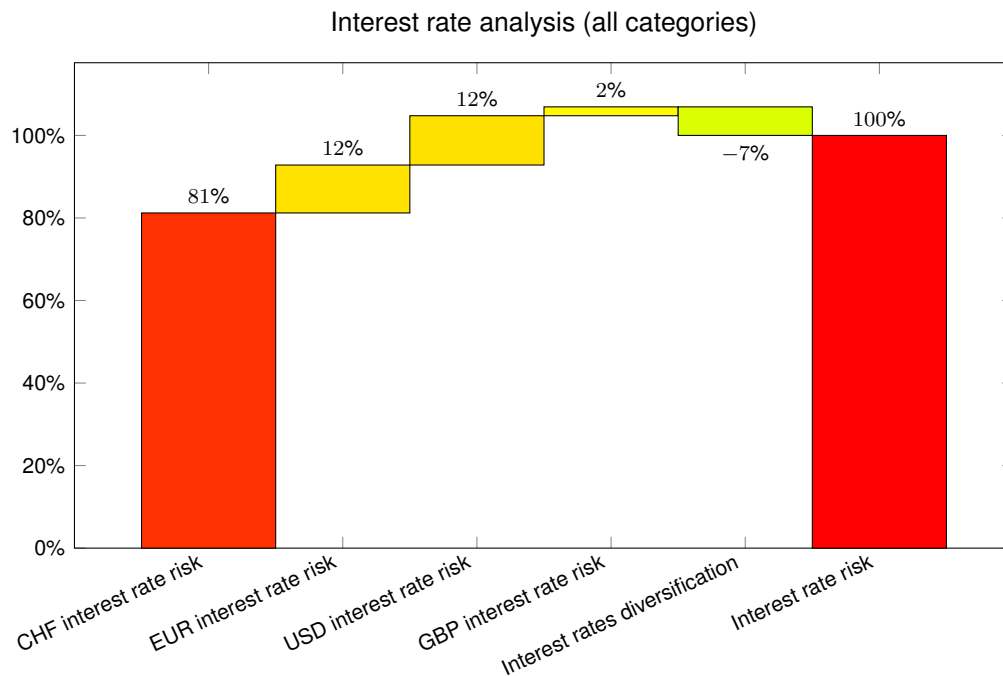


Figure 14a: Health (mean values)

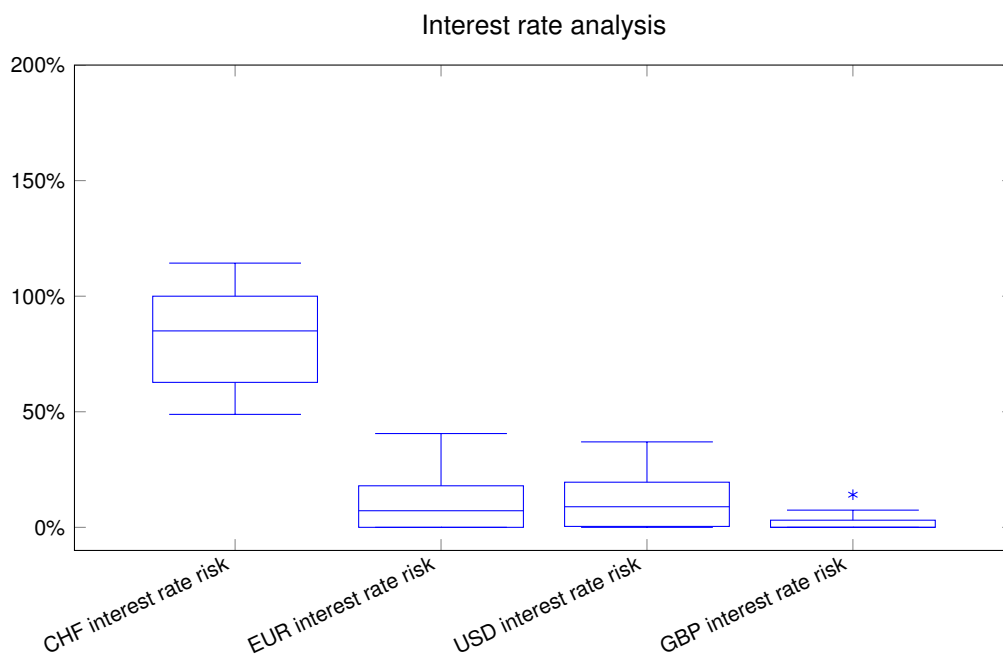


Figure 14b: Health (distribution)

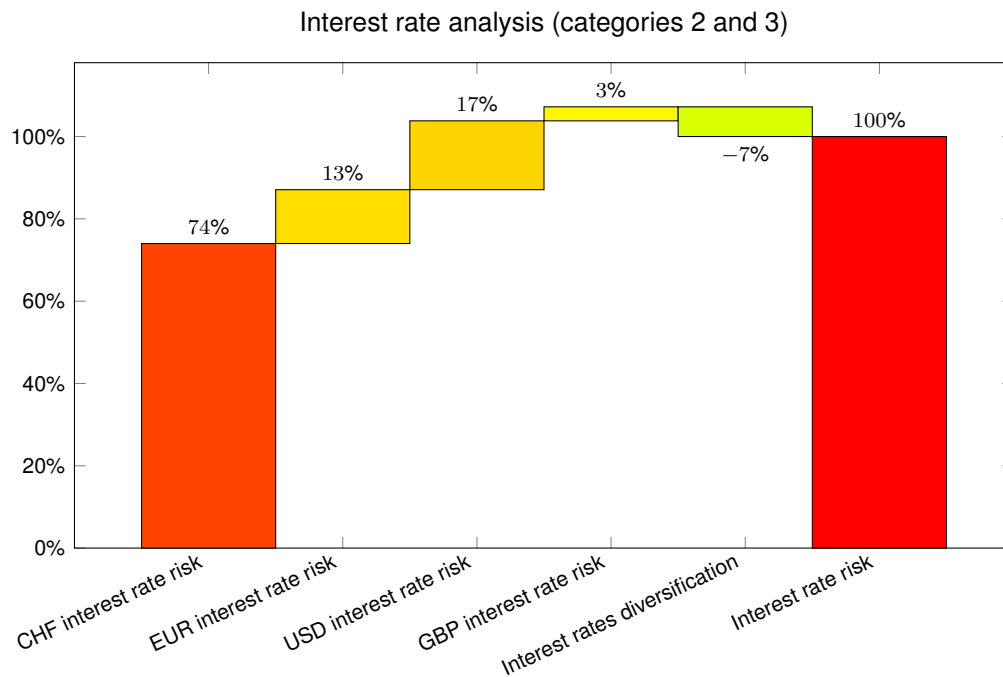


Figure 14c: Health (mean values)

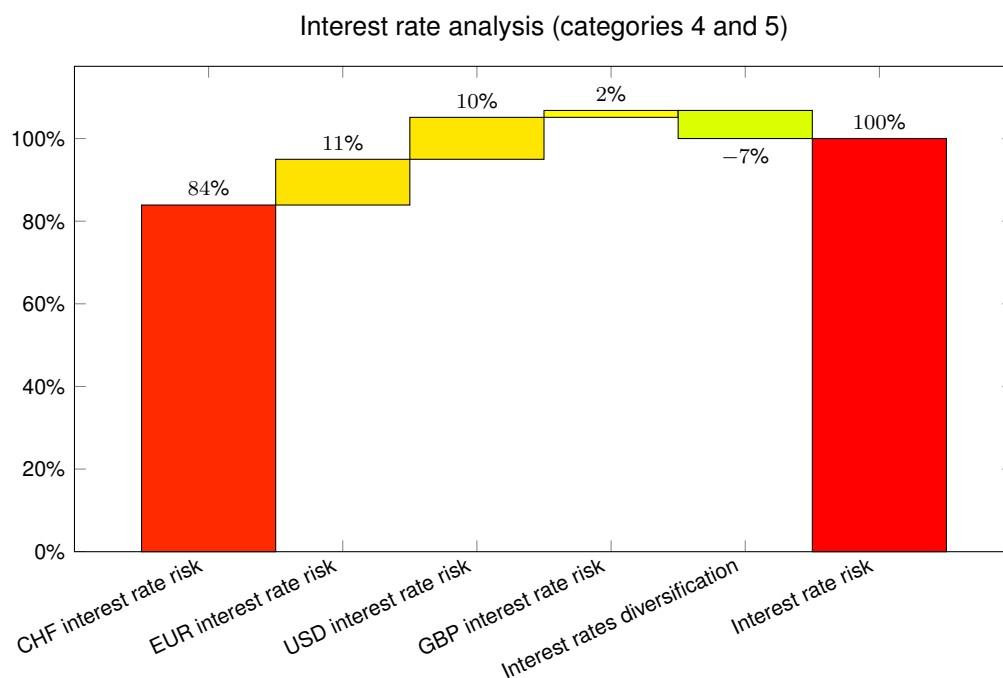


Figure 14d: Health (mean values)

## 4.9 Market and credit risk scenarios

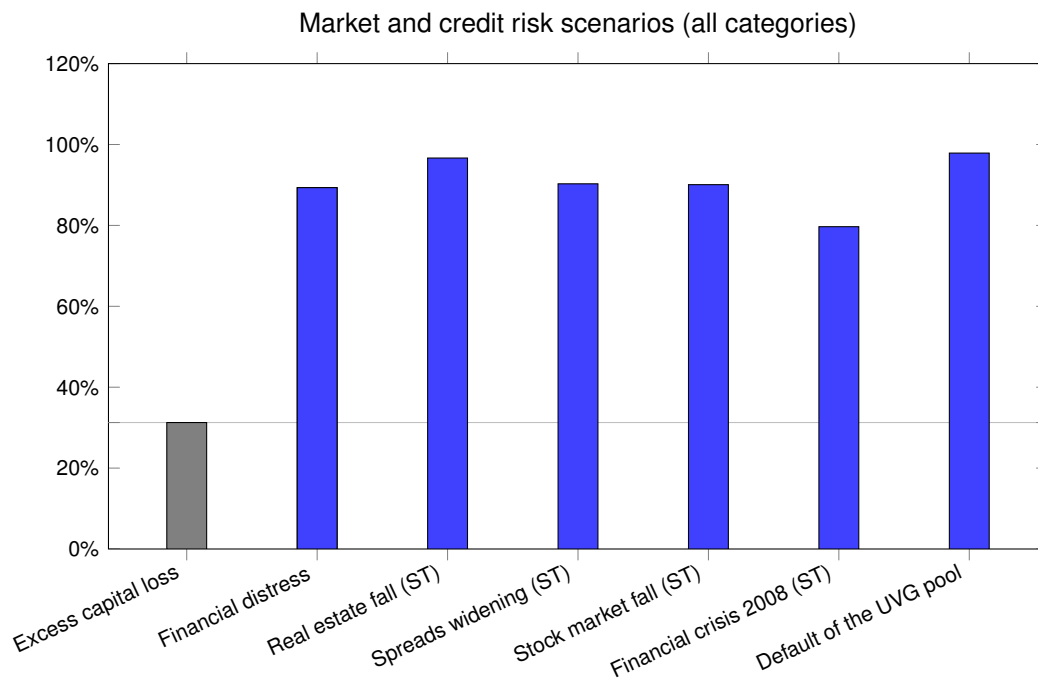


Figure 15a: Health (mean values)

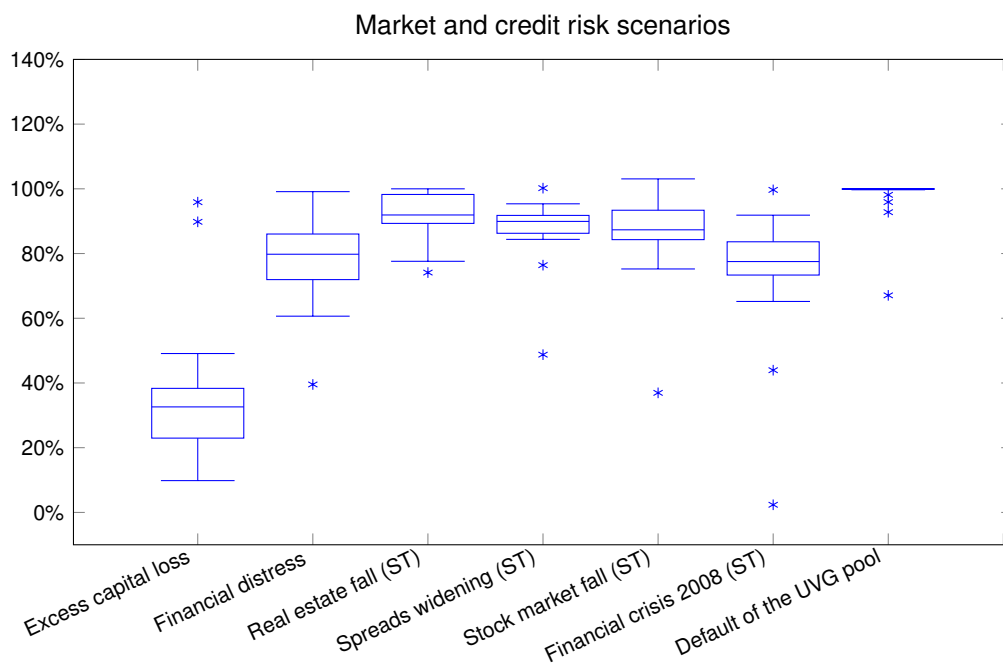


Figure 15b: Health (distribution)

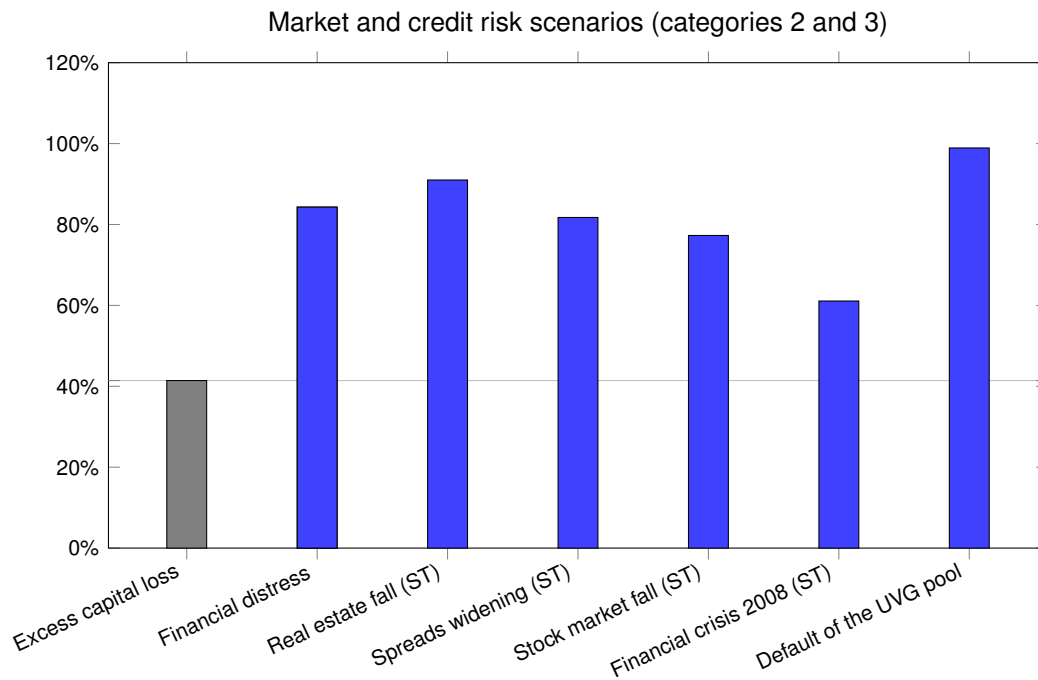


Figure 15c: Health (mean values)

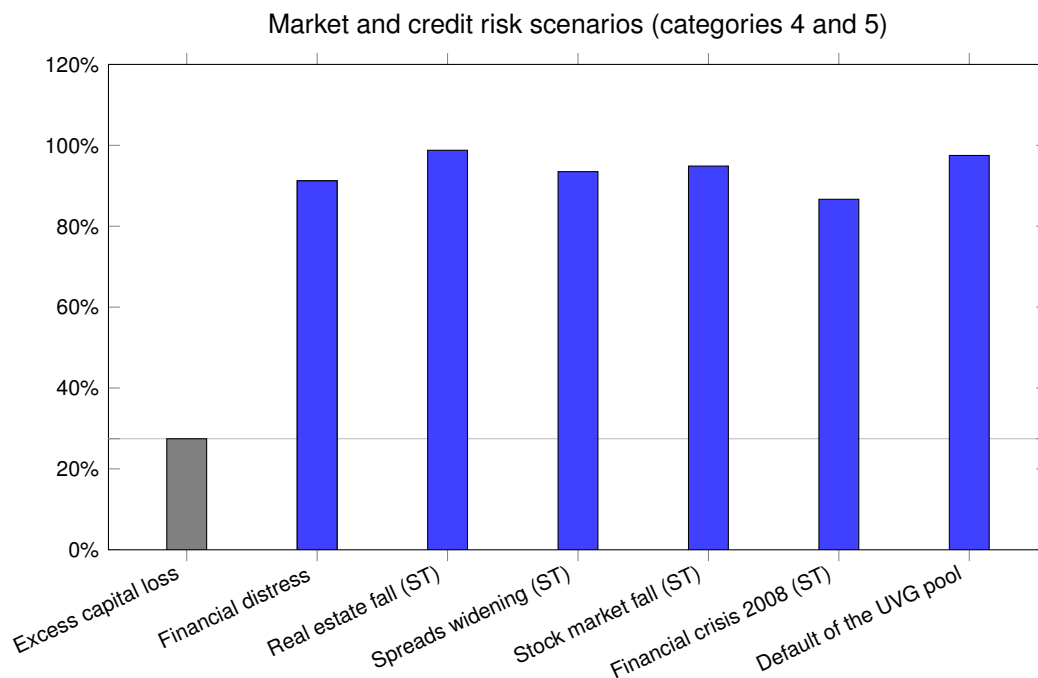


Figure 15d: Health (mean values)

#### 4.10 Insurance risk and global scenarios

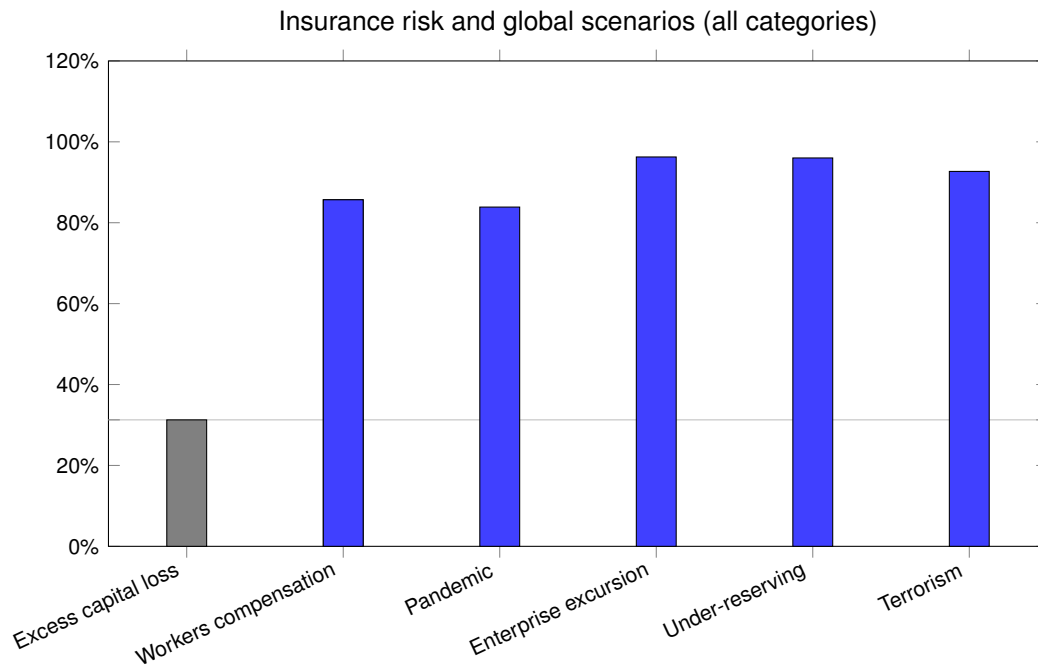


Figure 16a: Health (mean values)

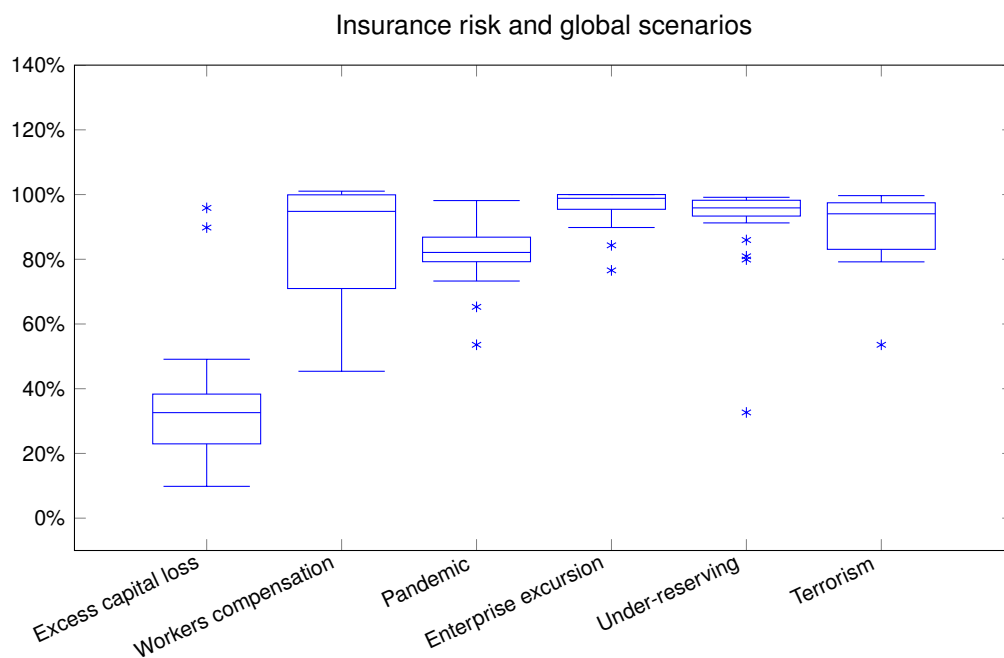


Figure 16b: Health (distribution)

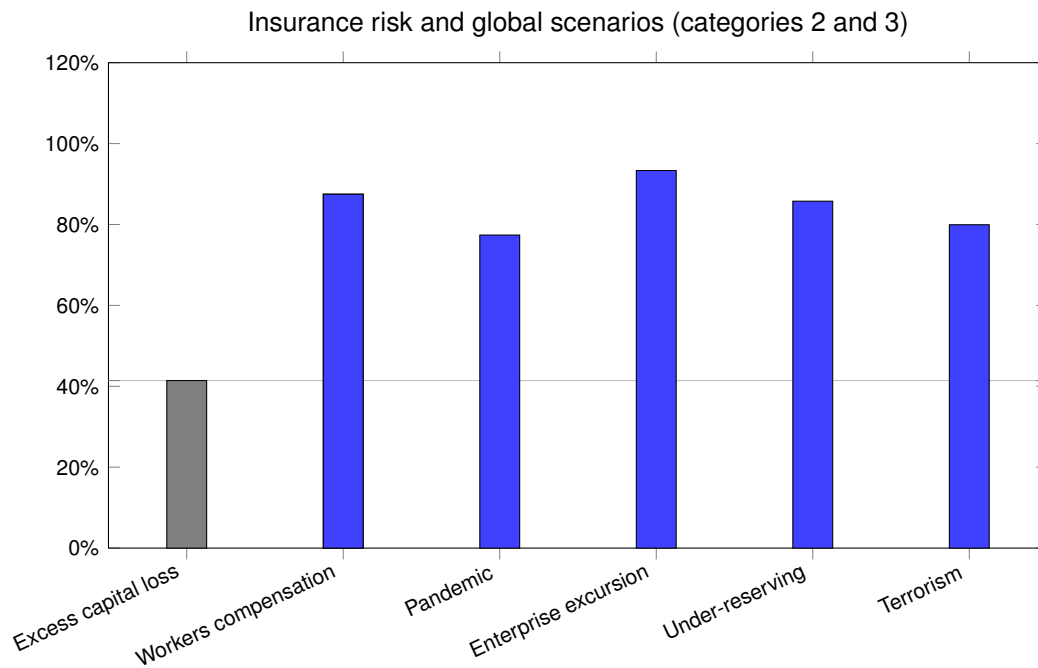


Figure 16c: Health (mean values)

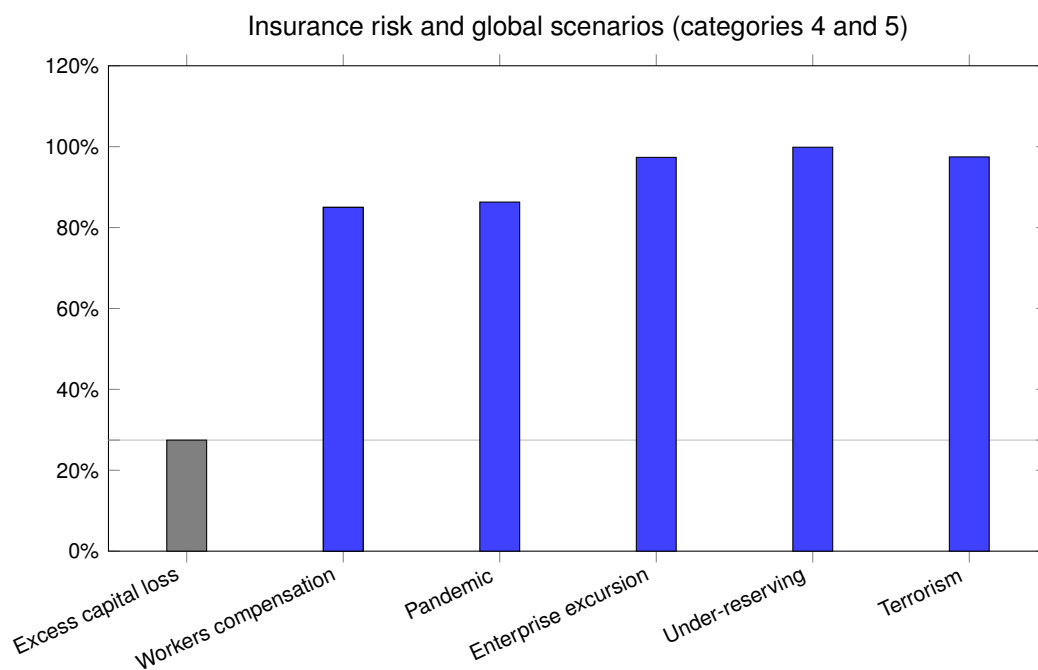


Figure 16d: Health (mean values)

## 5 General insurance

### 5.1 Goals of the analyses

The analyses presented in this section aim to give insight into the following:

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

Two types of graphs are shown:

- waterfall diagrams
- boxplots providing information on the dispersion of the data

To avoid conclusions that can be drawn regarding the individual risk profile of an insurer, the data of two neighbouring categories (e.g. categories 2 and 3 or categories 4 and 5) are pooled. This in case an individual category includes the data of less than five insurer.

#### Assets

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

#### Liabilities

The total liabilities of the market consistent balance sheet are shown as the sum of the different liability types.

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

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

- best estimate liability (BEL)
- market value margin (MVM)
- one-year capital requirement (SCR), which is reached by calculating the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are related 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, we have the following decomposing of assets:

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

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, when relevant, has been included in the supplementary capital. Now CC can be expressed in the following form

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

from which we derive by means of (1) the relation

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

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

### Market risk analysis

Market risk plays a dominant role in an economic, risk-oriented solvency regime. A number of risk factors such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to the market risk. Waterfall and boxplot 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 a case, the total interest rate risk consists of the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into its components arising from the four currencies CHF, EUR, USD and GBP, including diversification.

## Scenarios

For each scenario, we have computed the impact ratio, which is given by the sum of the 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  $c$  will have a negative value, representing a loss.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario equals the *excess capital* (EC), i.e.  $c = -\text{EC}$ . This loss is the maximum loss an insurer can endure while remaining solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). We have used the relation  $\text{RBC} = \text{TC} + \text{EC}$  to obtain the corresponding impact ratio:

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

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

Scenarios exempted from the target capital aggregation are called stress tests and are labelled (ST).

Note that there are scenarios which are relevant only for some, but not all sectors. For instance, the scenario “Default of UVG pool” may be relevant for general insurers, health and reinsurers. If not, the scenario will not be displayed.

## 5.2 Comments on results

Overall, general insurers reported a lower SST solvency ratio of 184% (down by nine basis points). This is owing to an increase in target capital (up 10.5% to CHF 41,749 million) which is partly compensated by an increase in risk-bearing capital (up 5.6% to CHF 77,014 million).

Target capital was dominated by insurance risk (mainly reserve risks and normal claim risks).

It should be pointed out that some general insurers have participations in life insurance companies. These may be modelled using a look-through method. Since their corresponding assets and liabilities are not shown, the assets and liabilities of general insurers do not always amount to 100% in the waterfall diagram decompositions.



### 5.3 Assets

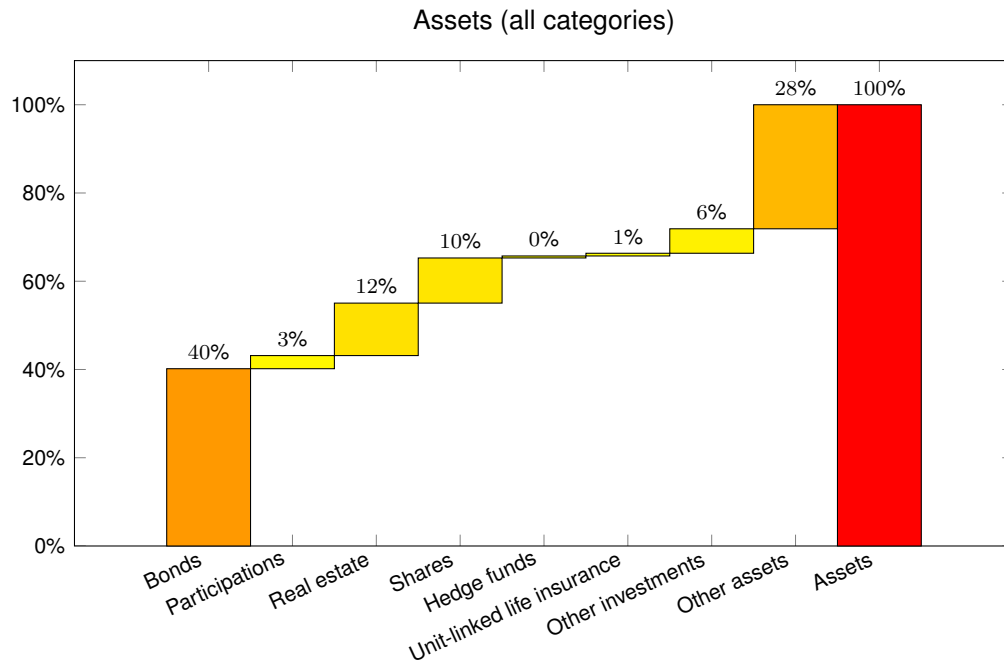


Figure 17a: General insurance (mean values)

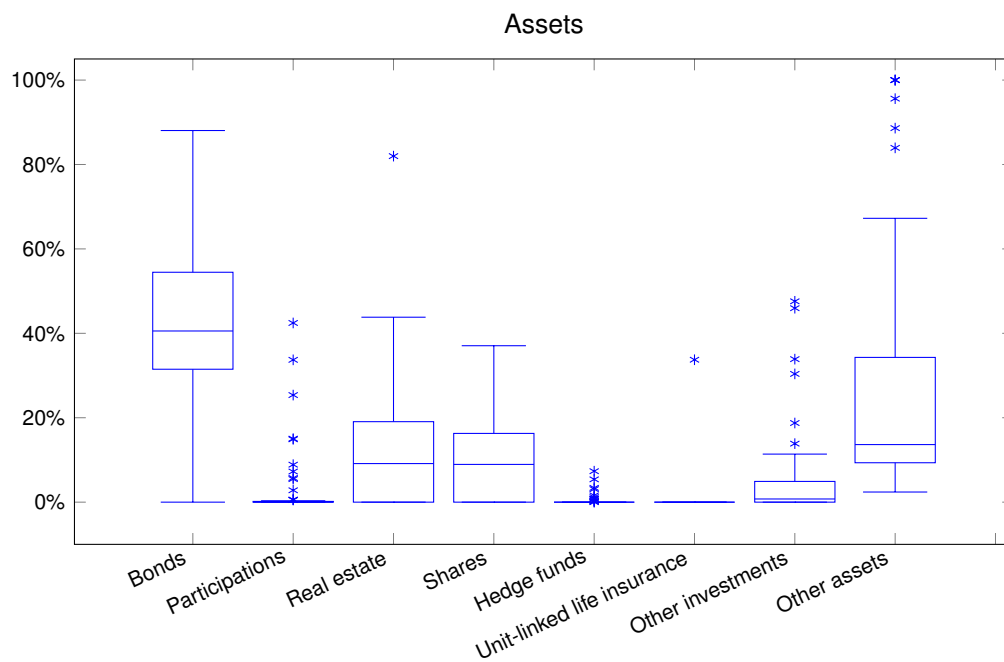


Figure 17b: General insurance (distribution)

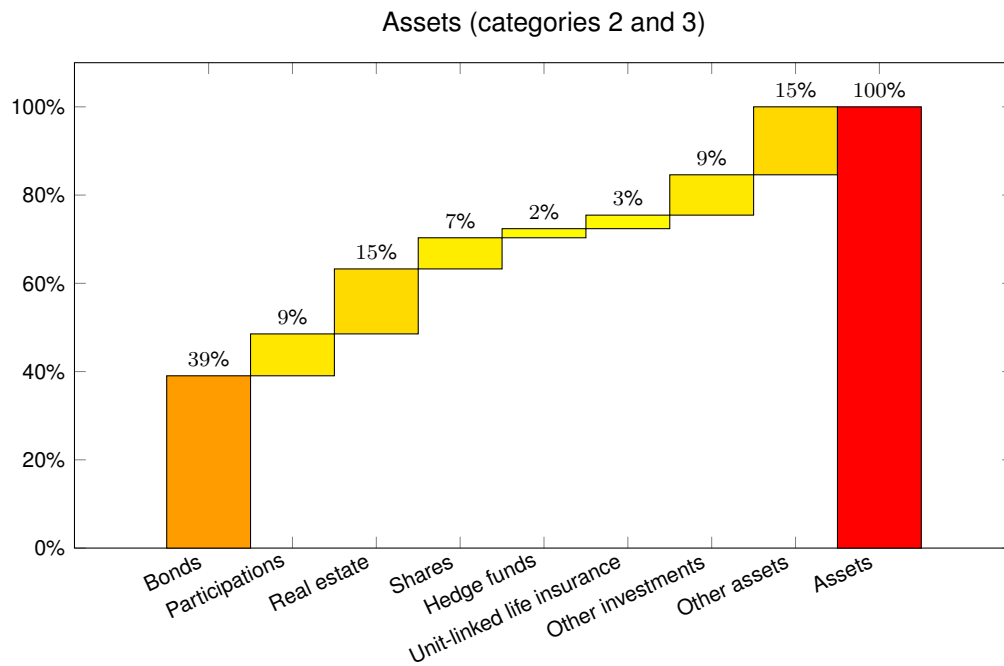


Figure 17c: General insurance (mean values)

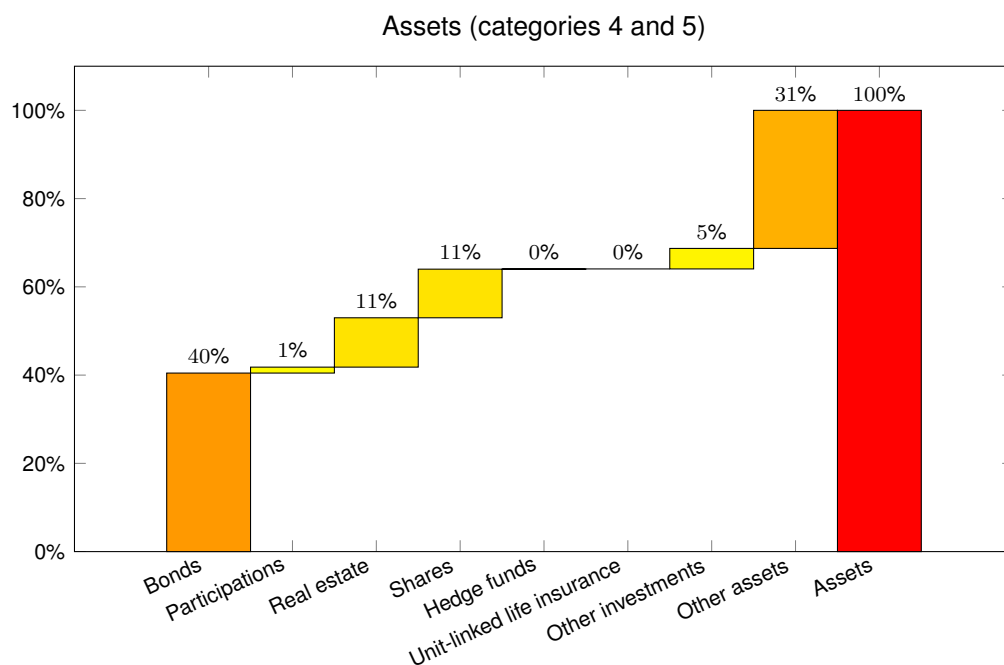


Figure 17d: General insurance (mean values)

## 5.4 Liabilities

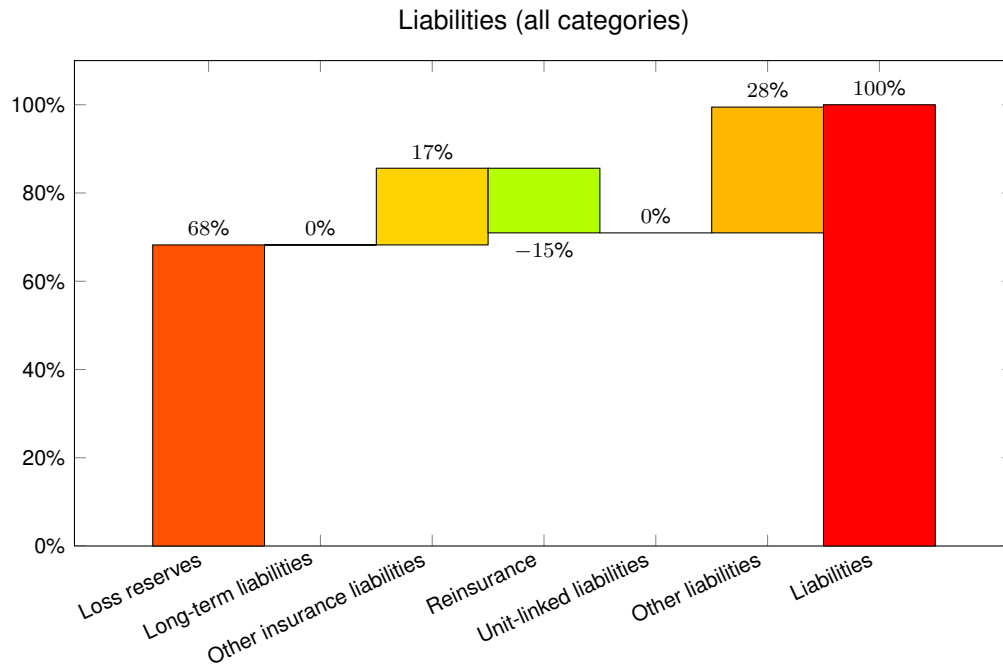


Figure 18a: General insurance (mean values)

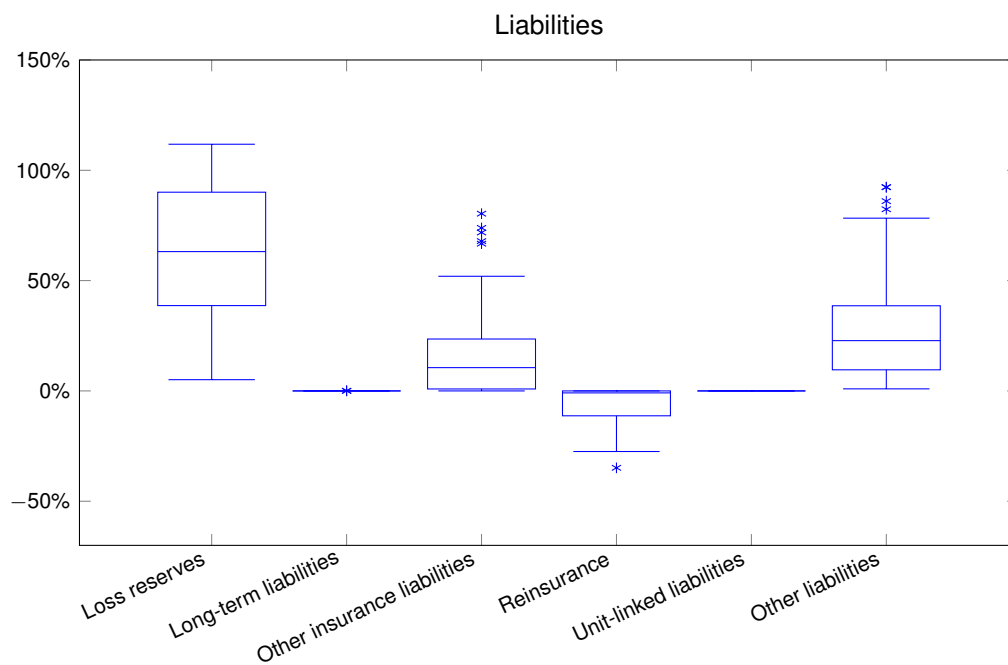


Figure 18b: General insurance (distribution)

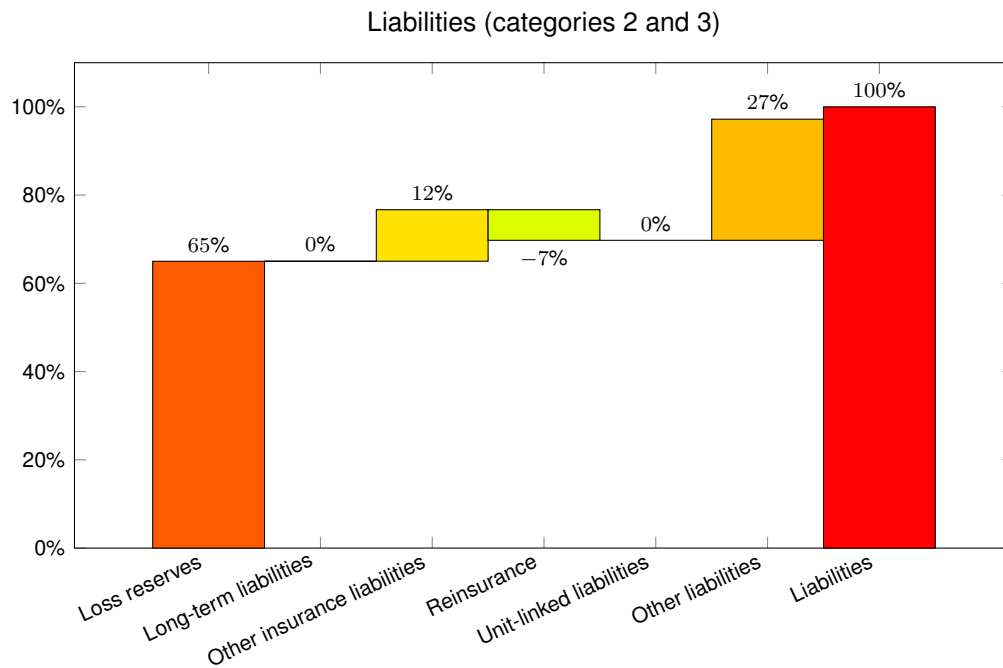


Figure 18c: General insurance (mean values)

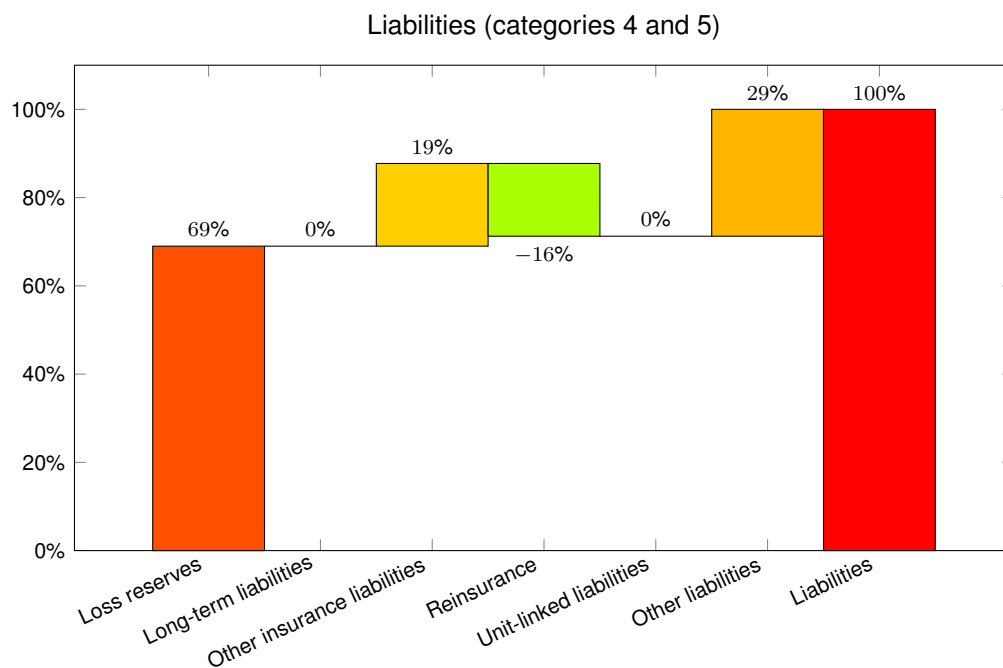


Figure 18d: General insurance (mean values)

## 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)

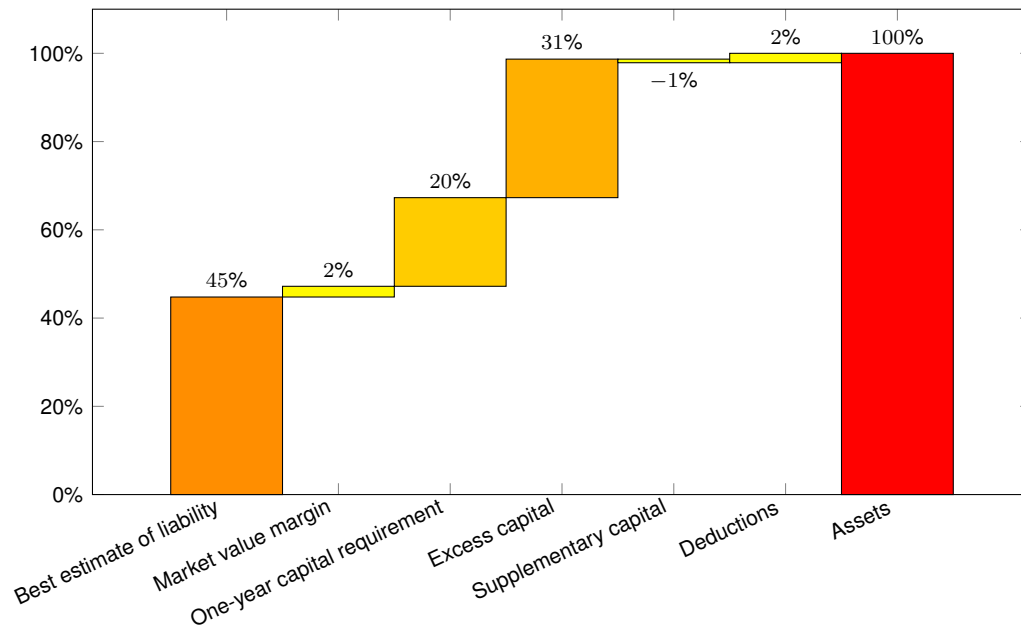


Figure 19a: General insurance (mean values)

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

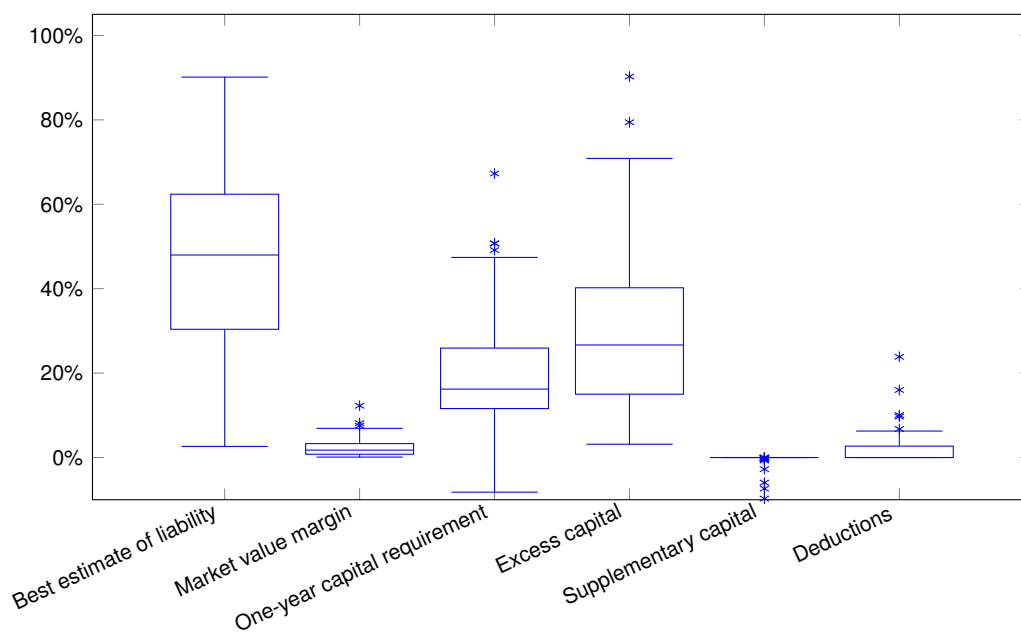


Figure 19b: General insurance (distribution)



Best estimate of liability and target capital in relation to the balance sheet total (categories 2 and 3)

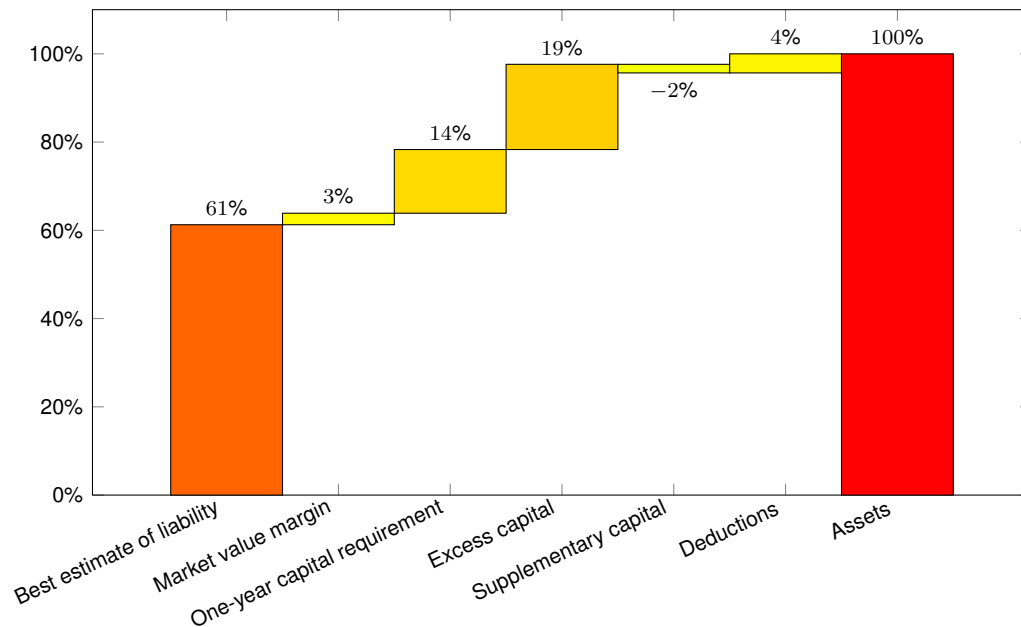


Figure 19c: General insurance (mean values)

Best estimate of liability and target capital in relation to the balance sheet total (categories 4 and 5)

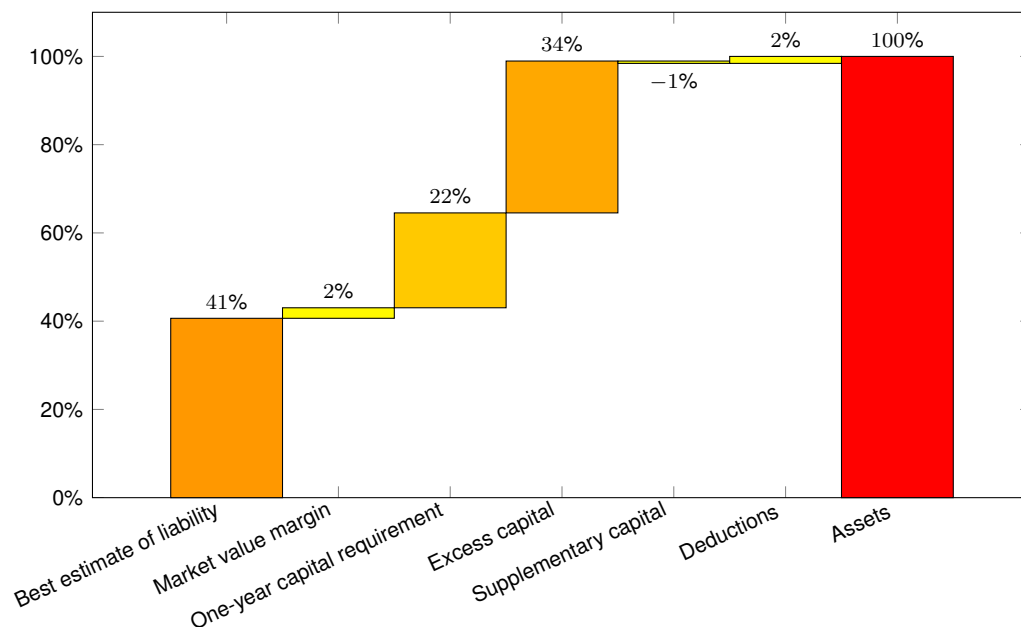


Figure 19d: General insurance (mean values)

## 5.6 Target capital decomposition

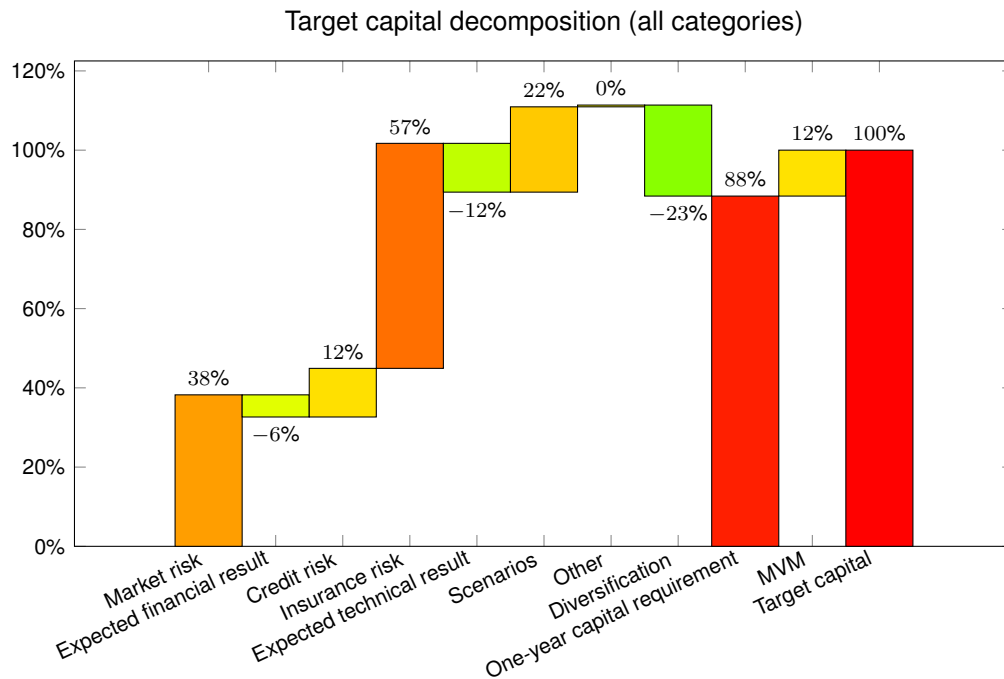


Figure 20a: General insurance (mean values)

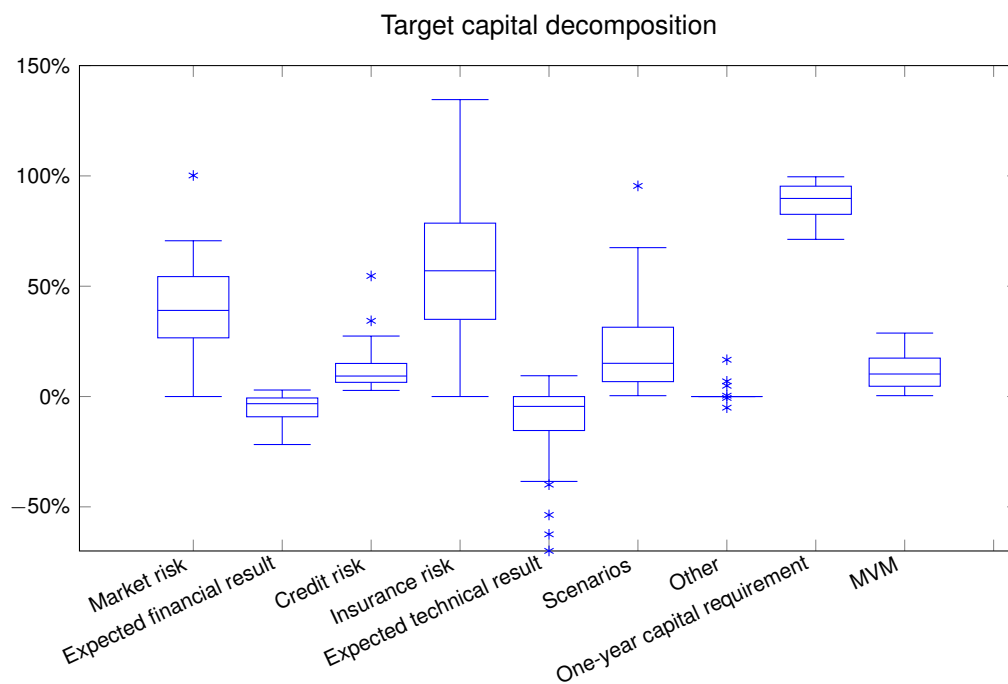


Figure 20b: General insurance (distribution)

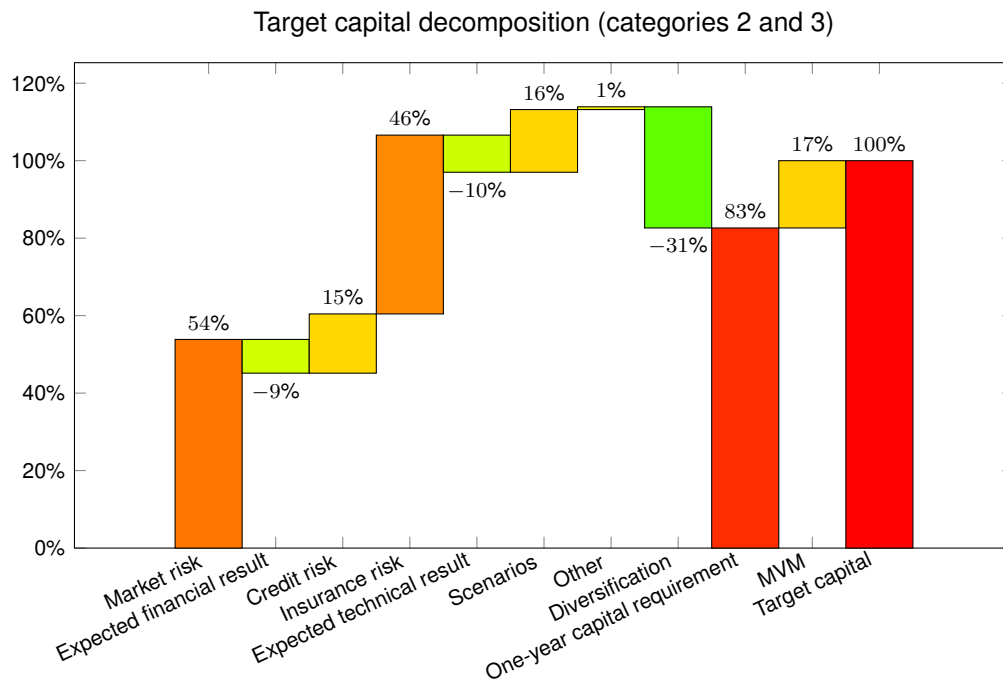


Figure 20c: General insurance (mean values)

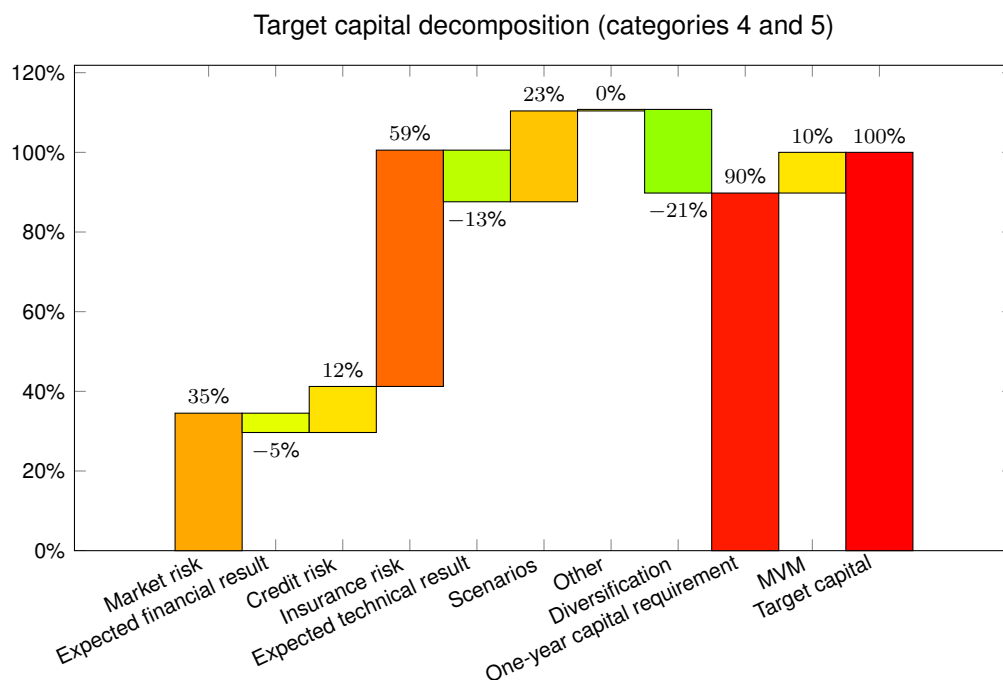


Figure 20d: General insurance (mean values)

## 5.7 Market risk analysis

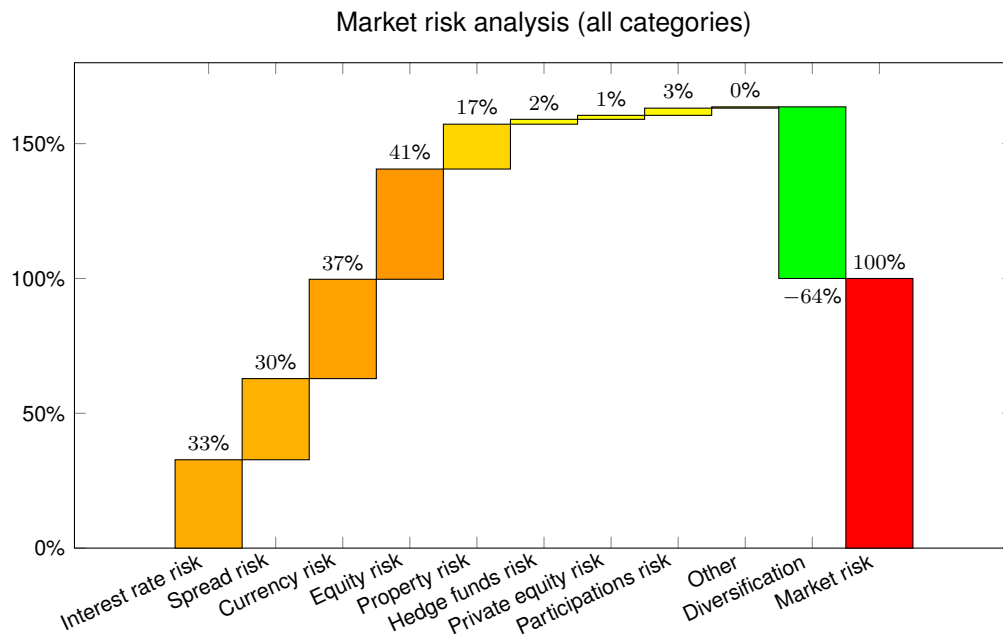


Figure 21a: General insurance (mean values)

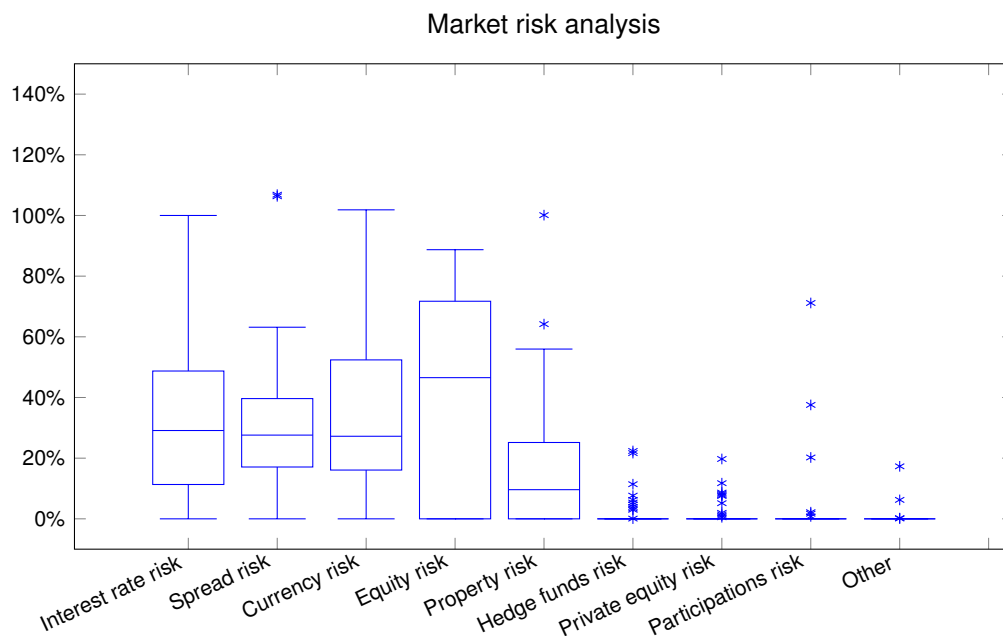


Figure 21b: General insurance (distribution)

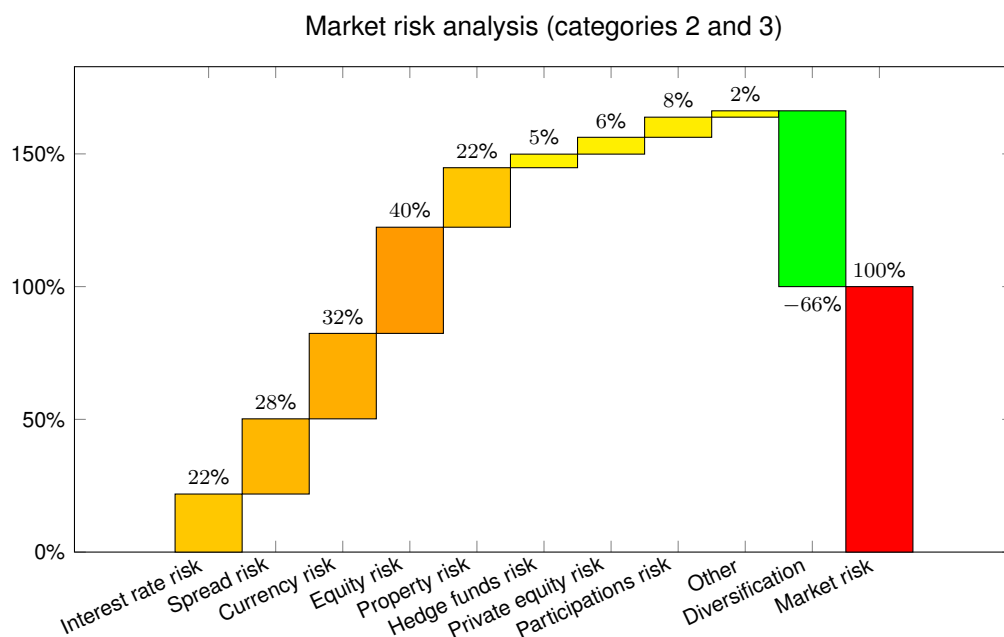


Figure 21c: General insurance (mean values)

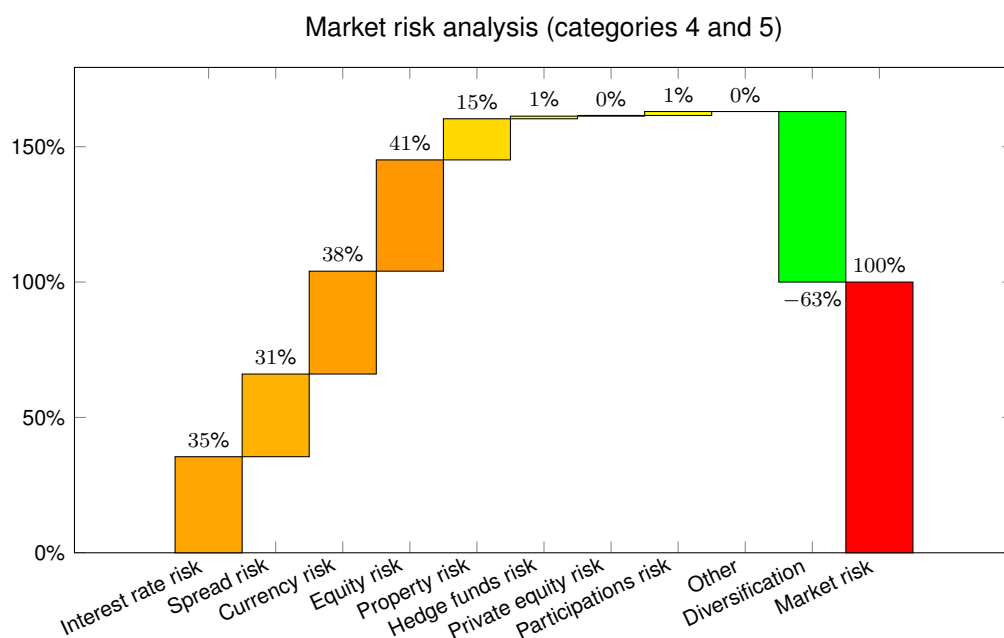


Figure 21d: General insurance (mean values)

## 5.8 Interest rate analysis

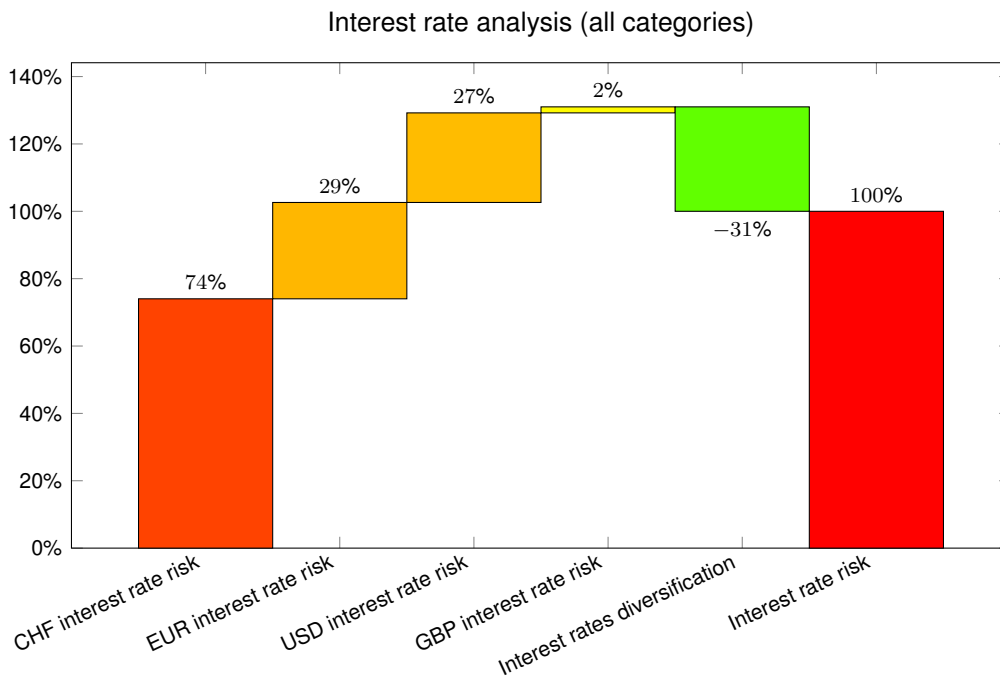


Figure 22a: General insurance (mean values)

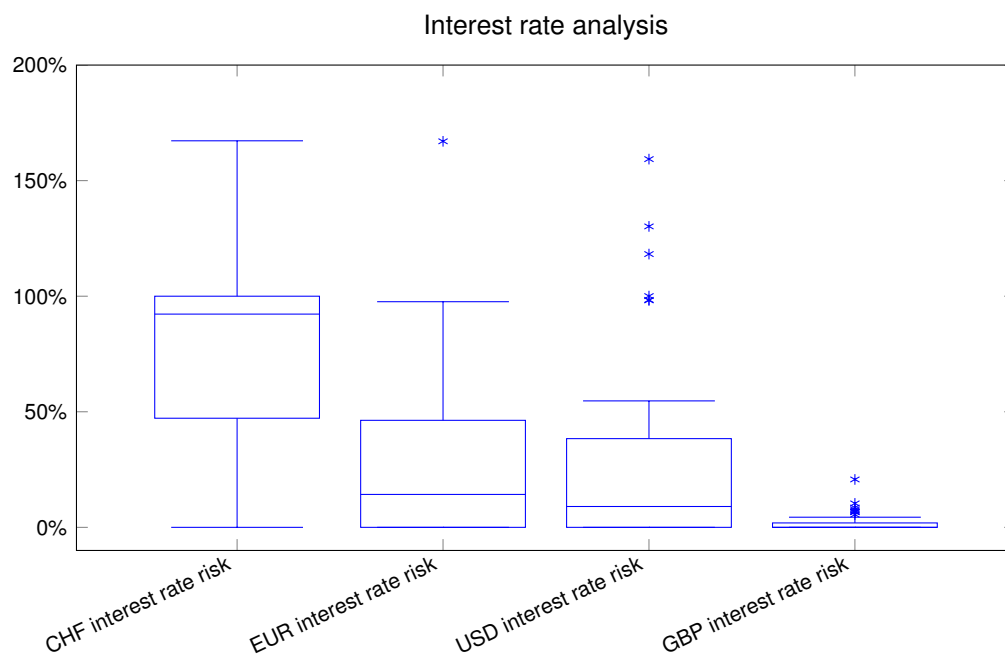


Figure 22b: General insurance (distribution)

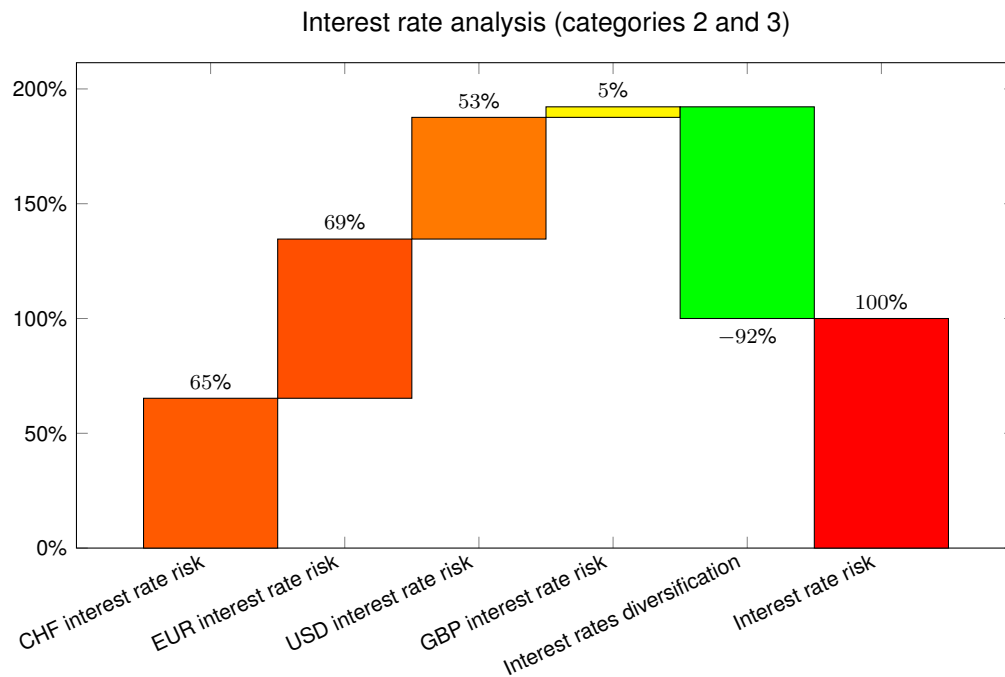


Figure 22c: General insurance (mean values)

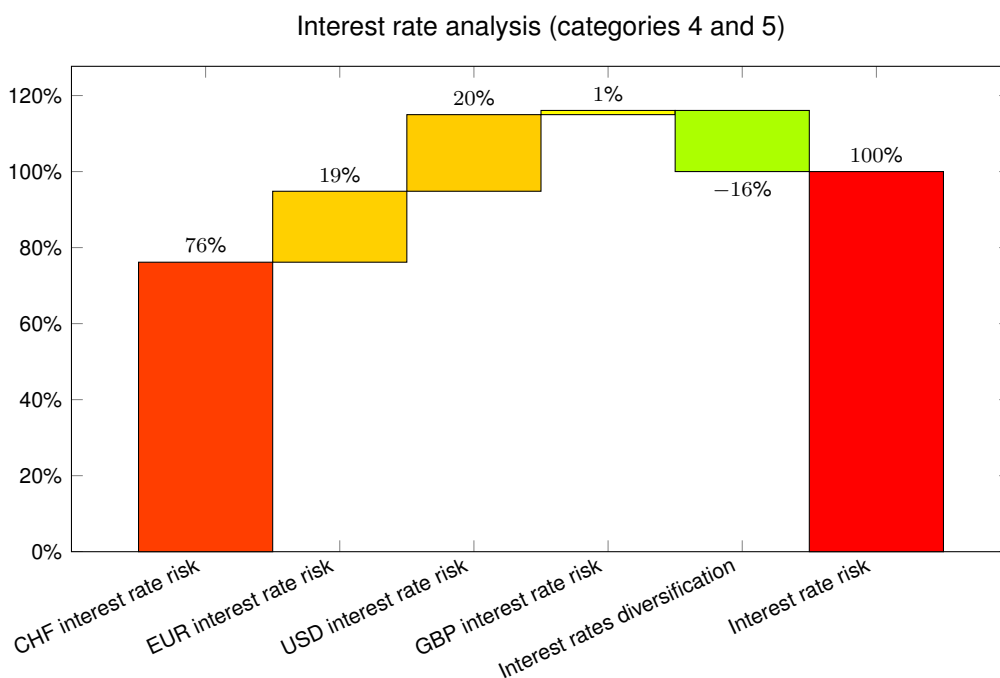


Figure 22d: General insurance (mean values)

## 5.9 General insurance risk analysis

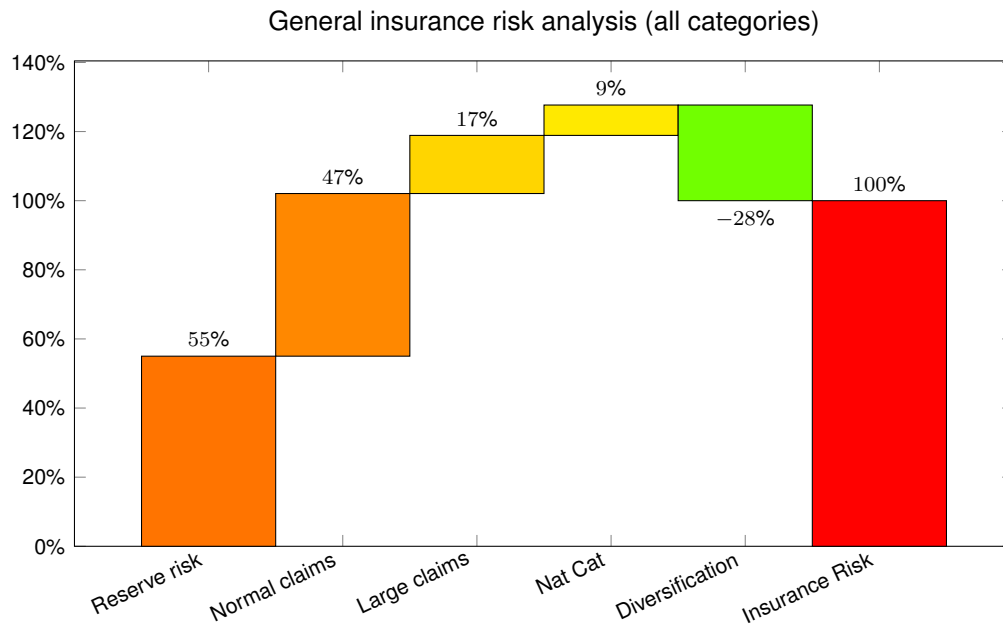


Figure 23a: General insurance (mean values)

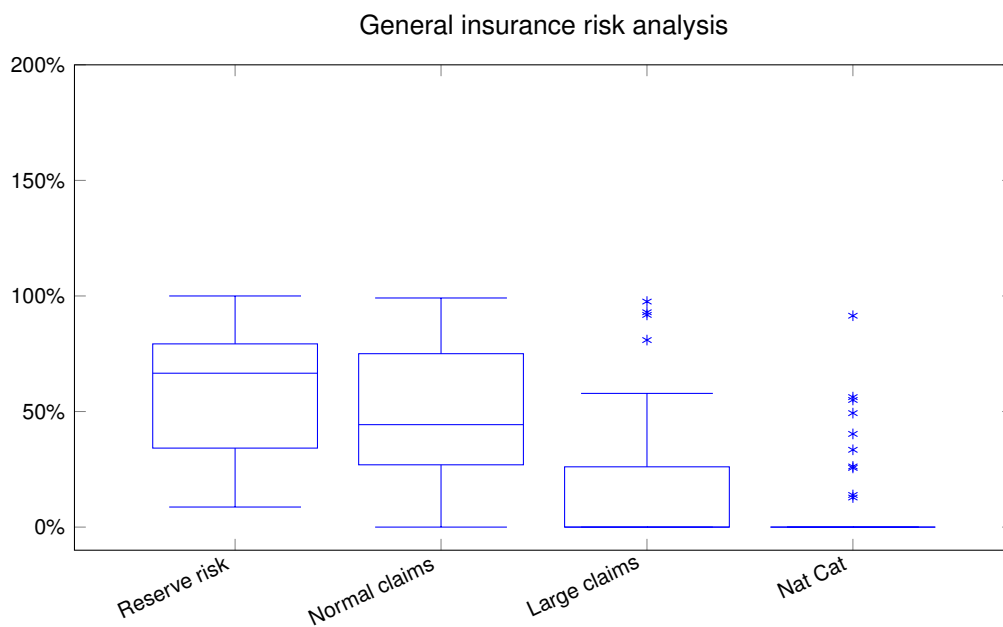


Figure 23b: General insurance (distribution)



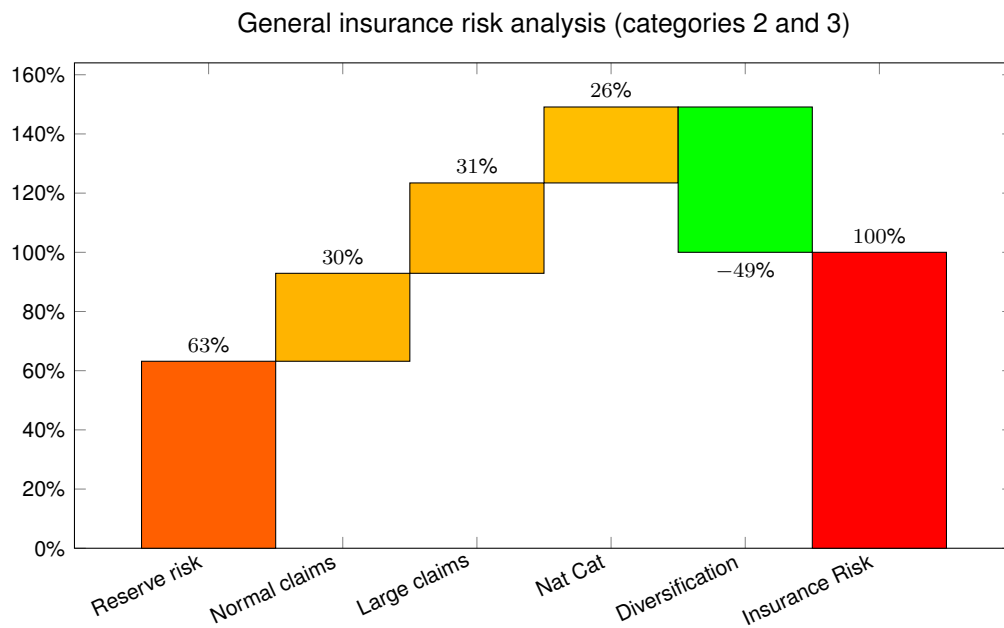


Figure 23c: General insurance (mean values)

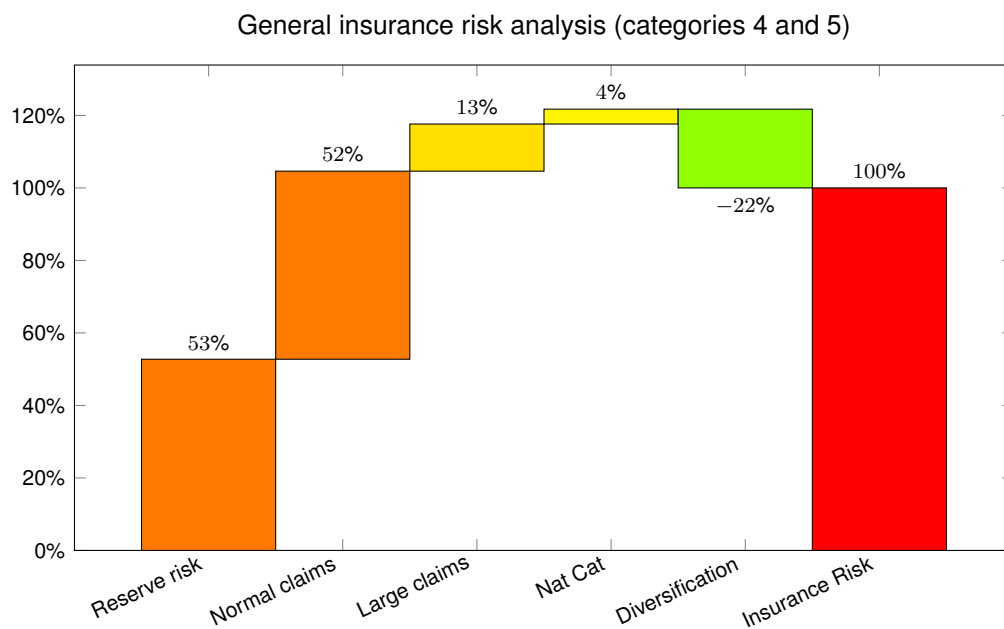


Figure 23d: General insurance (mean values)

## 5.10 Market and credit risk scenarios

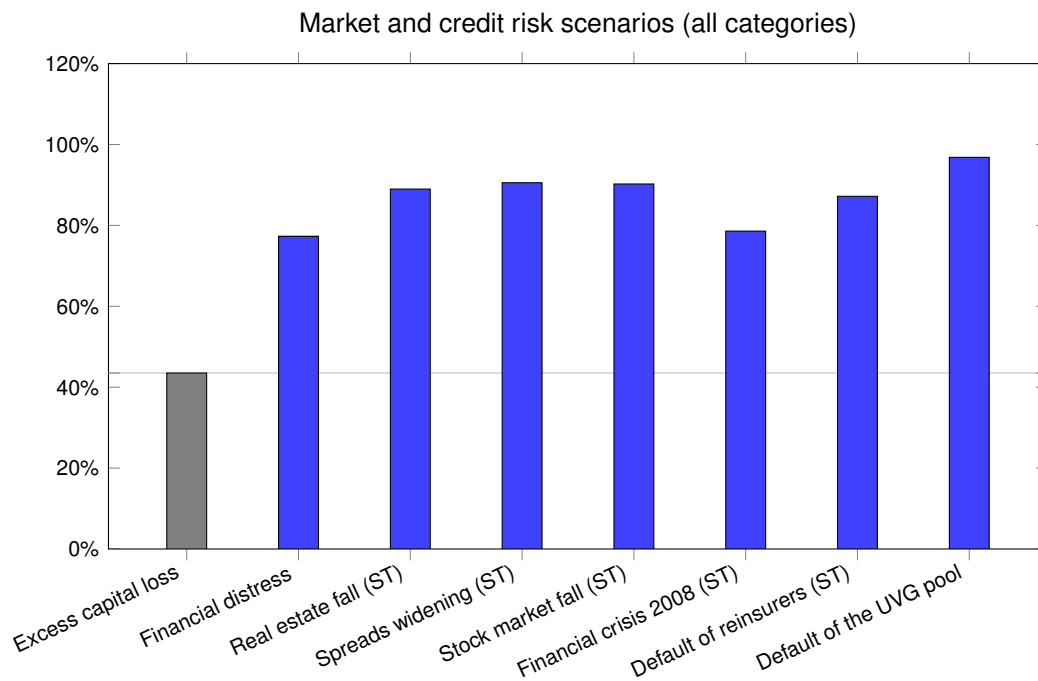


Figure 24a: General insurance (mean values)

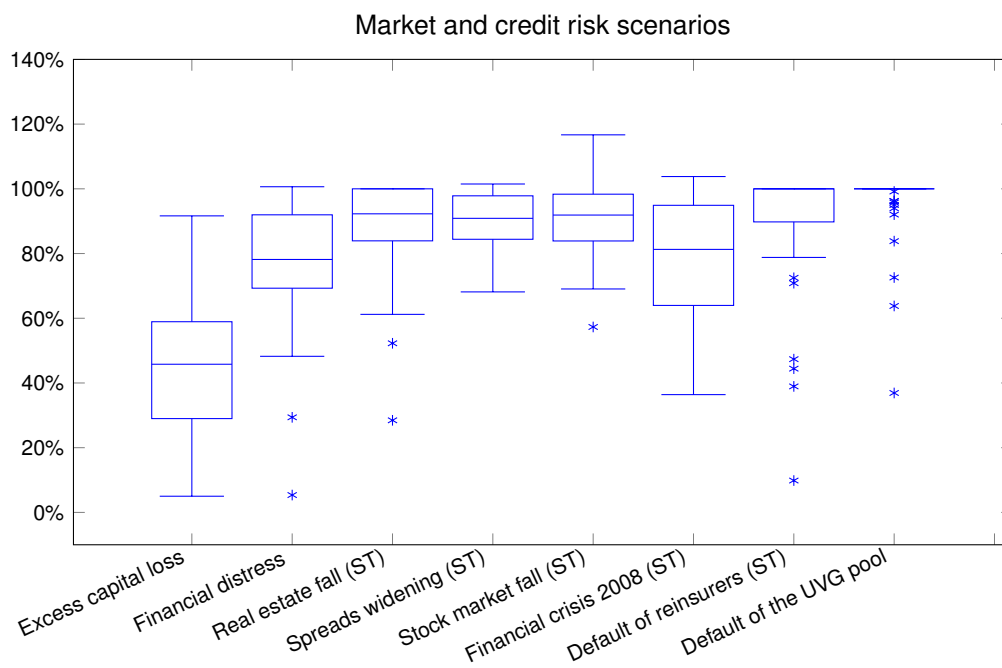


Figure 24b: General insurance (distribution)

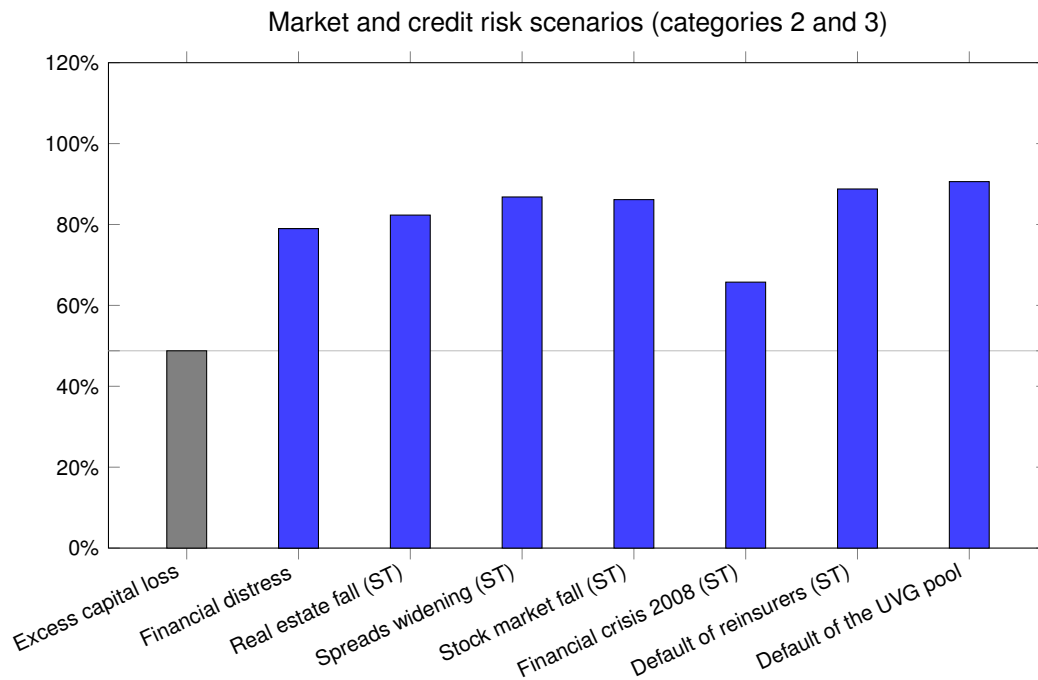


Figure 24c: General insurance (mean values)

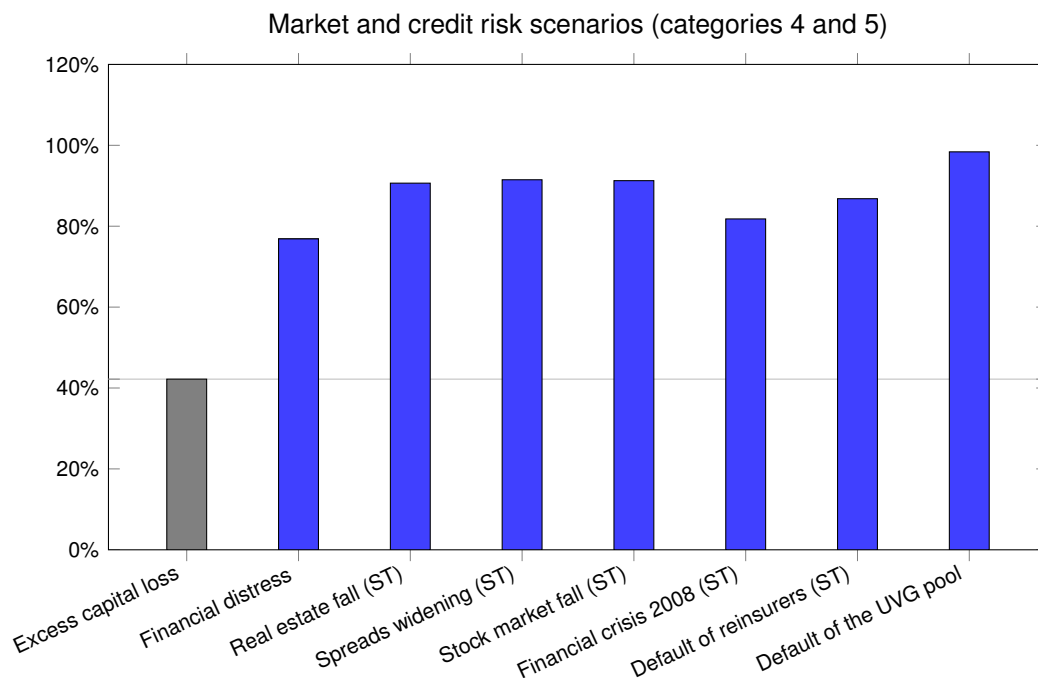


Figure 24d: General insurance (mean values)

## 5.11 Insurance risk and global scenarios

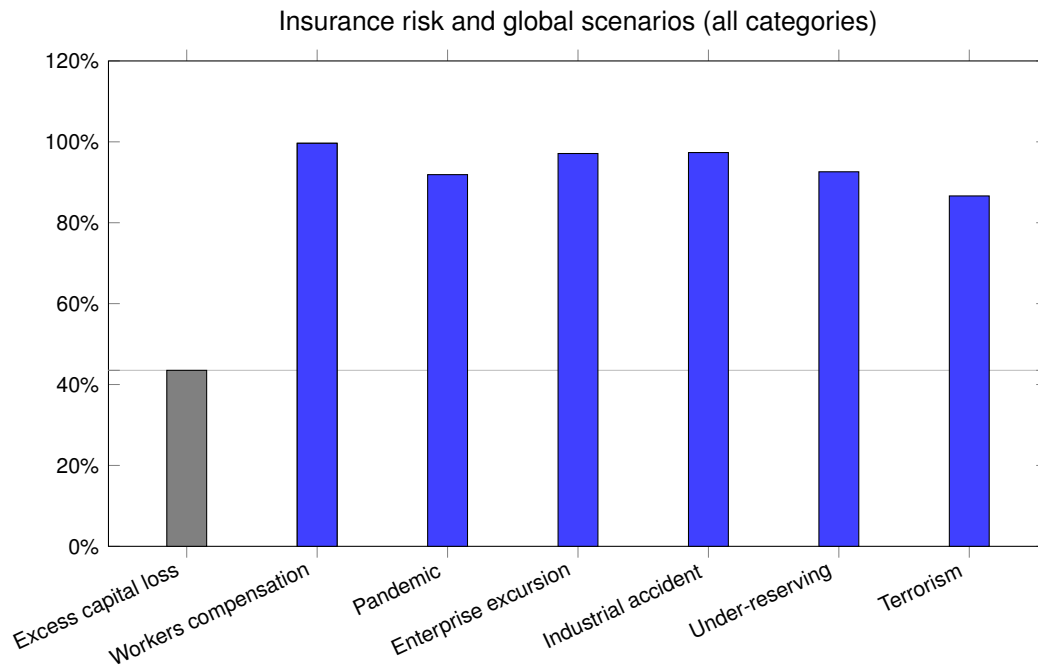


Figure 25a: General insurance (mean values)

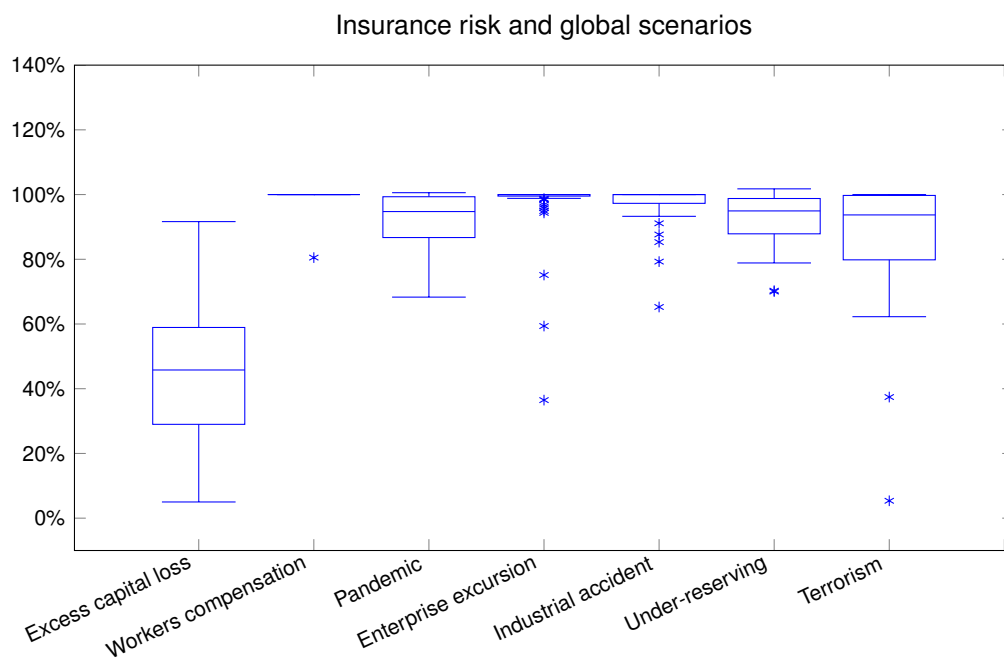


Figure 25b: General insurance (distribution)

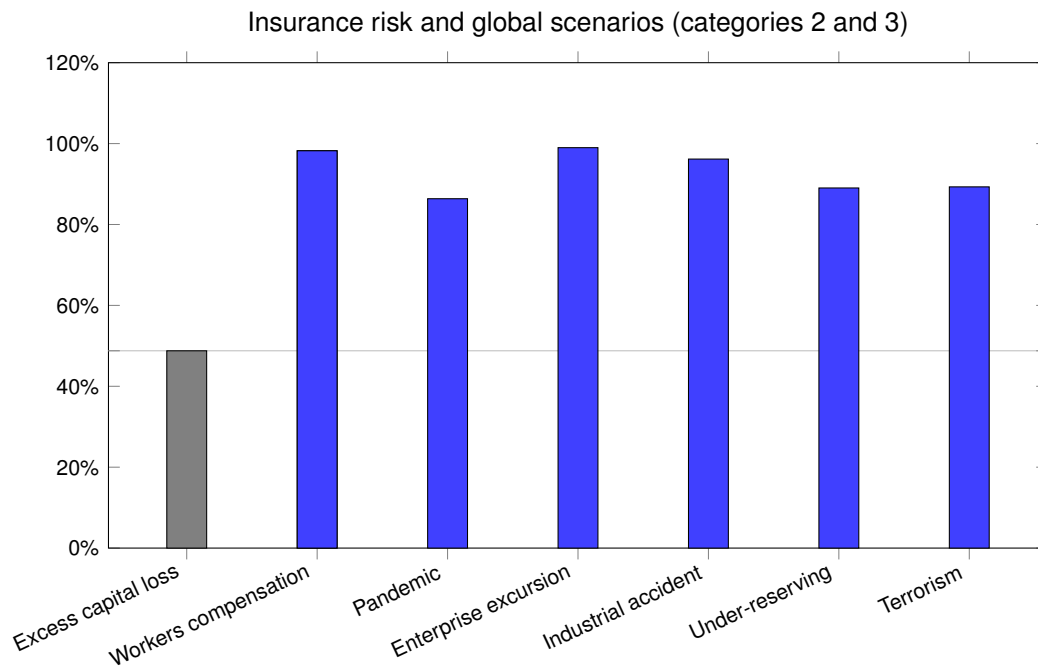


Figure 25c: General insurance (mean values)

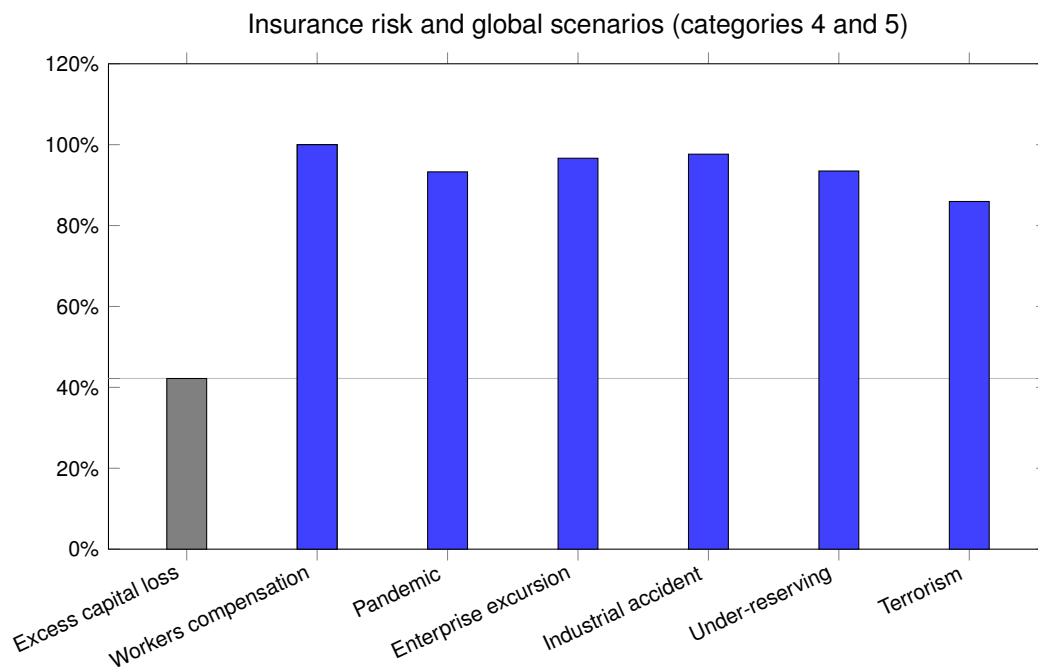


Figure 25d: General insurance (mean values)

## 6 Reinsurance

### 6.1 Goals of the analyses

The analyses presented in this section aim to give insight into the following:

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

Two types of graphs are shown:

- waterfall diagrams
- boxplots providing information on the dispersion of the data

To avoid conclusions that can be drawn regarding the individual risk profile of an insurer, the data of two neighbouring categories (e.g. categories 2 and 3 or categories 4 and 5) are pooled. This in case an individual category includes the data of less than five insurer.

#### Assets

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

#### Liabilities

The total liabilities of the market consistent balance sheet are shown as the sum of the different liability types.

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

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

- best estimate liability (BEL)
- market value margin (MVM)
- one-year capital requirement (SCR), which is reached by calculating the difference between the target capital (TC) and the market value margin. The TC, SCR and MVM are related 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, we have the following decomposing of assets:

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

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, when relevant, has been included in the supplementary capital. Now CC can be expressed in the following form

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

from which we derive by means of (1) the relation

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

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

### Market risk analysis

Market risk plays a dominant role in an economic, risk-oriented solvency regime. A number of risk factors such as interest rates, credit spreads, exchange rates, real estate, to name but a few, contribute to the market risk. Waterfall and boxplot 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 a case, the total interest rate risk consists of the interest rate risk of each currency. We have shown the decomposition of the total interest rate risk into its components arising from the four currencies CHF, EUR, USD and GBP, including diversification.

## Scenarios

For each scenario, we have computed the impact ratio, which is given by the sum of the 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  $c$  will have a negative value, representing a loss.

Furthermore, a reference scenario called excess capital loss was introduced. The loss of this scenario equals the *excess capital* (EC), i.e.  $c = -\text{EC}$ . This loss is the maximum loss an insurer can endure while remaining solvent. It should be noted that the impact ratio of this reference scenario can be expressed with the help of the target capital (TC). We have used the relation  $\text{RBC} = \text{TC} + \text{EC}$  to obtain the corresponding impact ratio:

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

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

Scenarios exempted from the target capital aggregation are called stress tests and are labelled (ST).

Note that there are scenarios which are relevant only for some, but not all sectors. For instance, the scenario “Default of UVG pool” may be relevant for general insurers, health and reinsurers. If not, the scenario will not be displayed.

## 6.2 Comments on results

Reinsurers experienced a drop of 11 basis points in their SST solvency ratio (down to 217%), reaching approximately the level they had in 2013. This decrease is due to target capital going up by 12.9% to CHF 27,791 million, and is partly offset by risk-bearing capital rising by 7.5% to CHF 60,349 million.

The diversification effect typical of the reinsurance industry allows companies to limit their capital requirements, which are largely determined by insurance risks. In 2015, reinsurers have been using their own internal risk models to estimate the target capital.





### 6.3 Assets

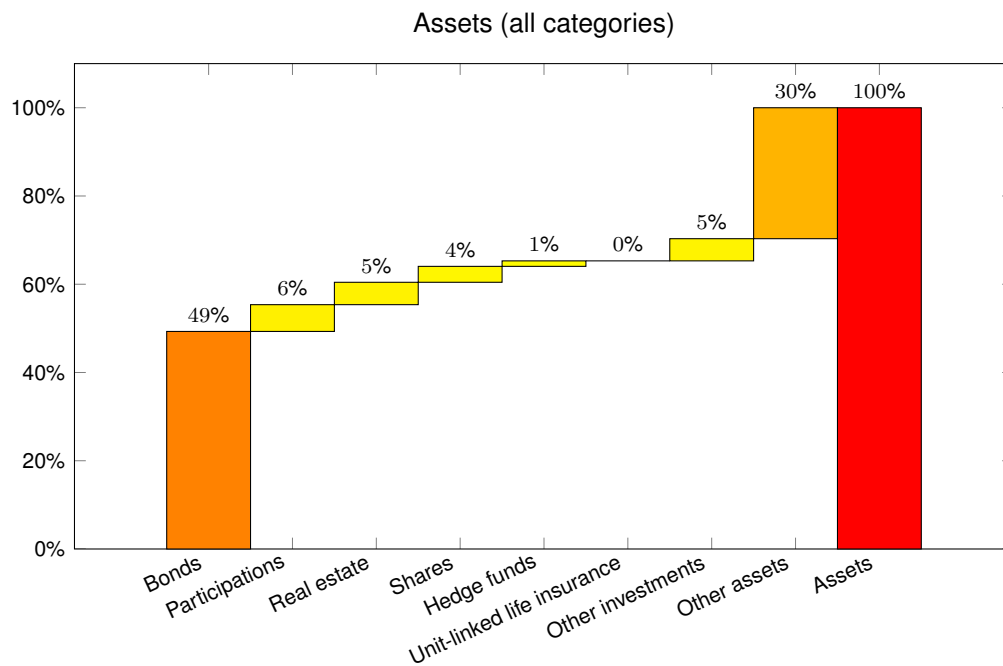


Figure 26a: Reinsurance (mean values)

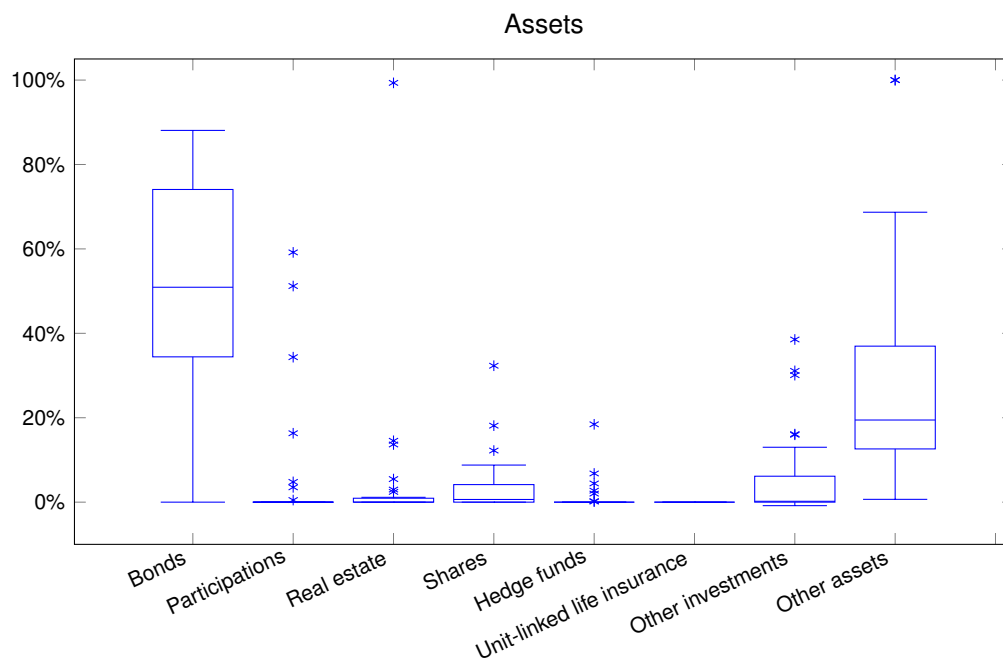


Figure 26b: Reinsurance (distribution)

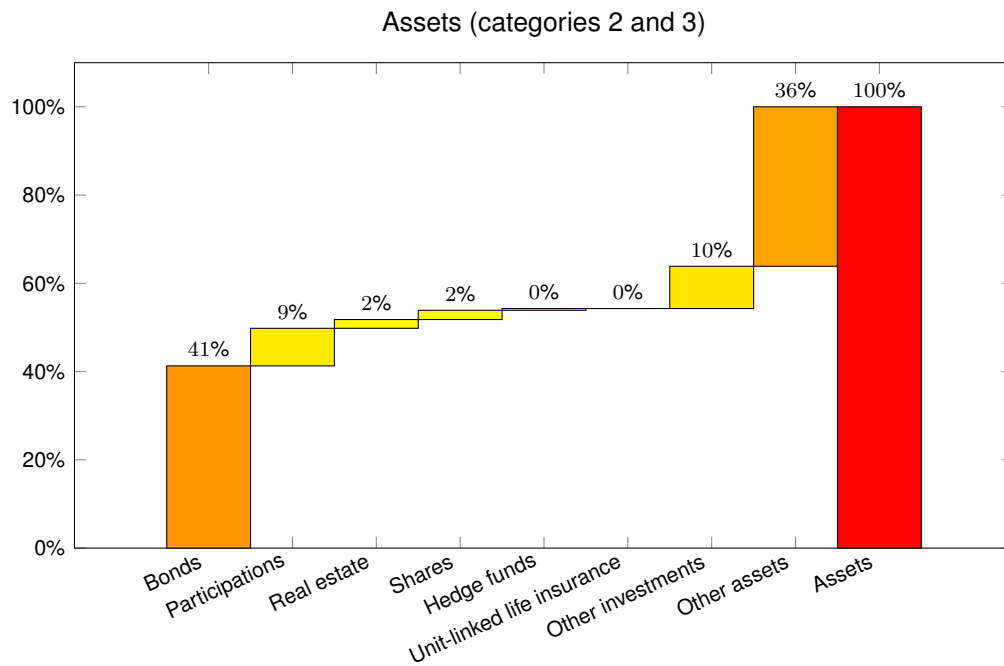


Figure 26c: Reinsurance (mean values)

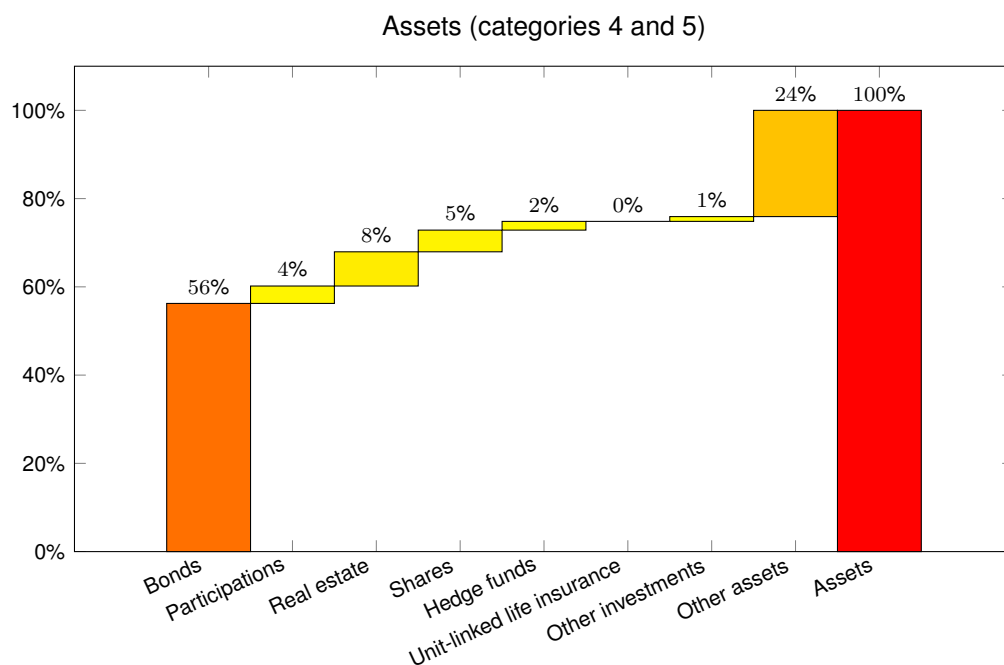


Figure 26d: Reinsurance (mean values)

## 6.4 Liabilities

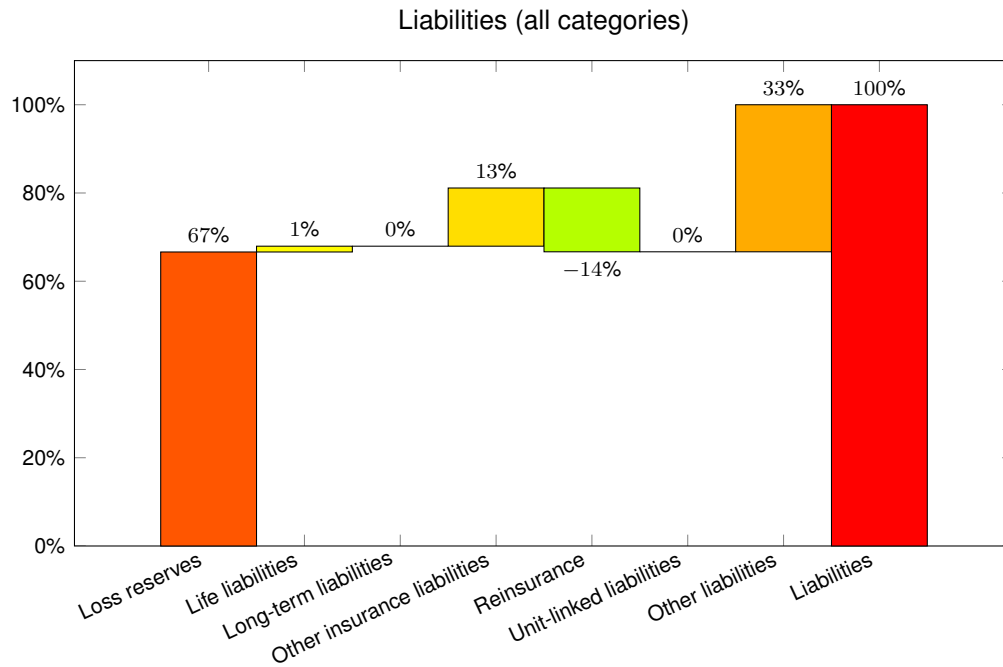


Figure 27a: Reinsurance (mean values)

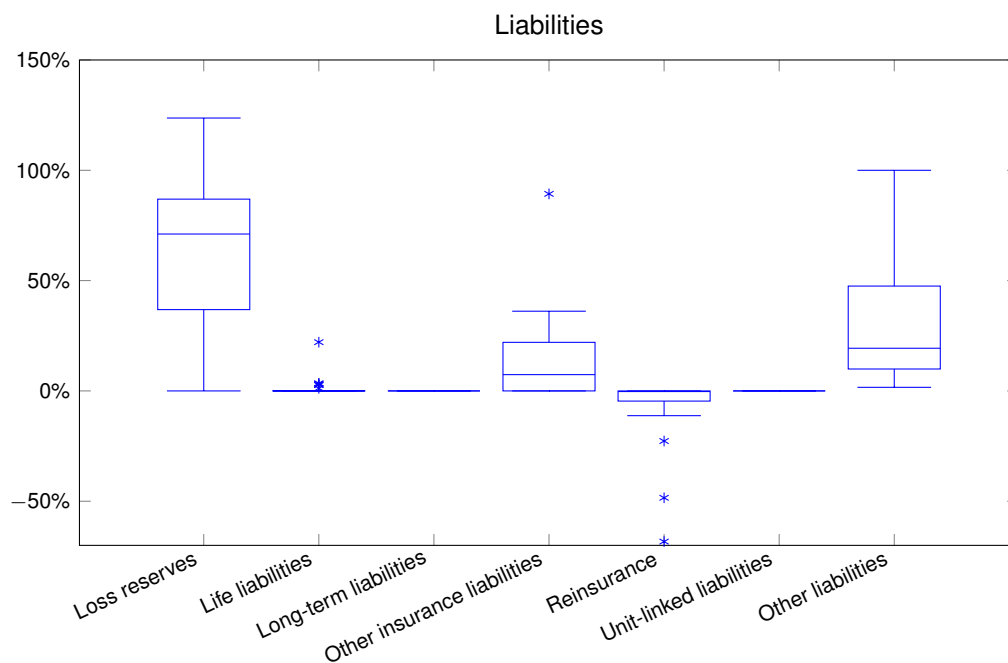


Figure 27b: Reinsurance (distribution)

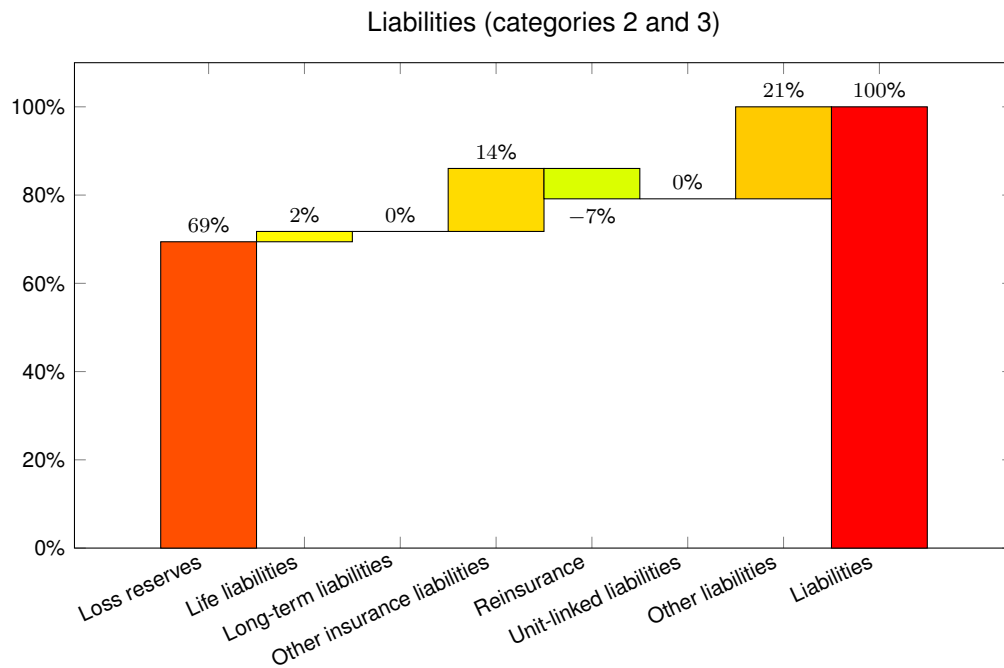


Figure 27c: Reinsurance (mean values)

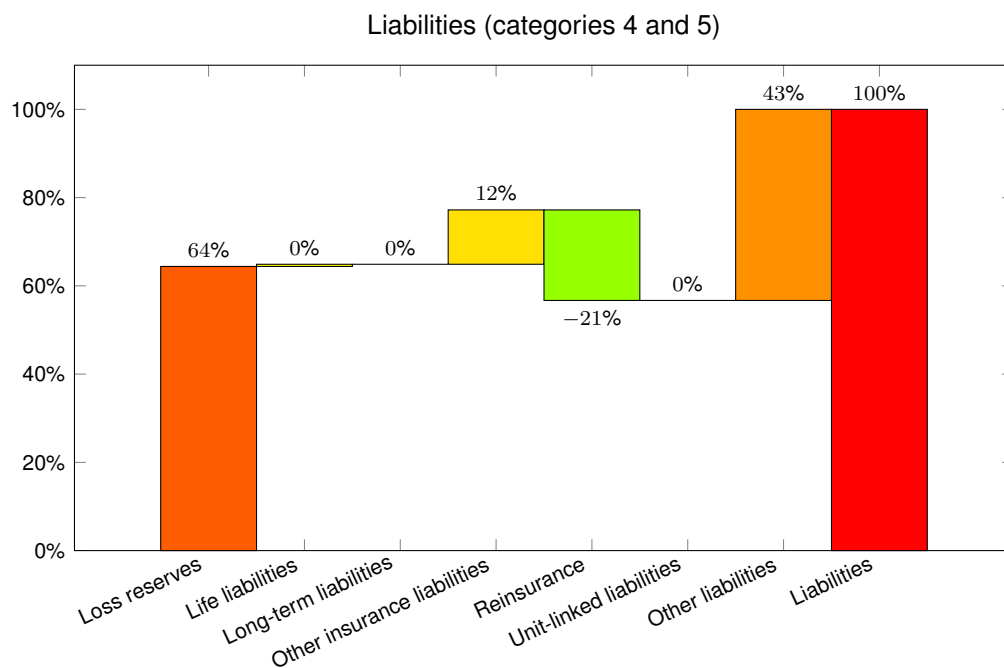


Figure 27d: Reinsurance (mean values)

## 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)

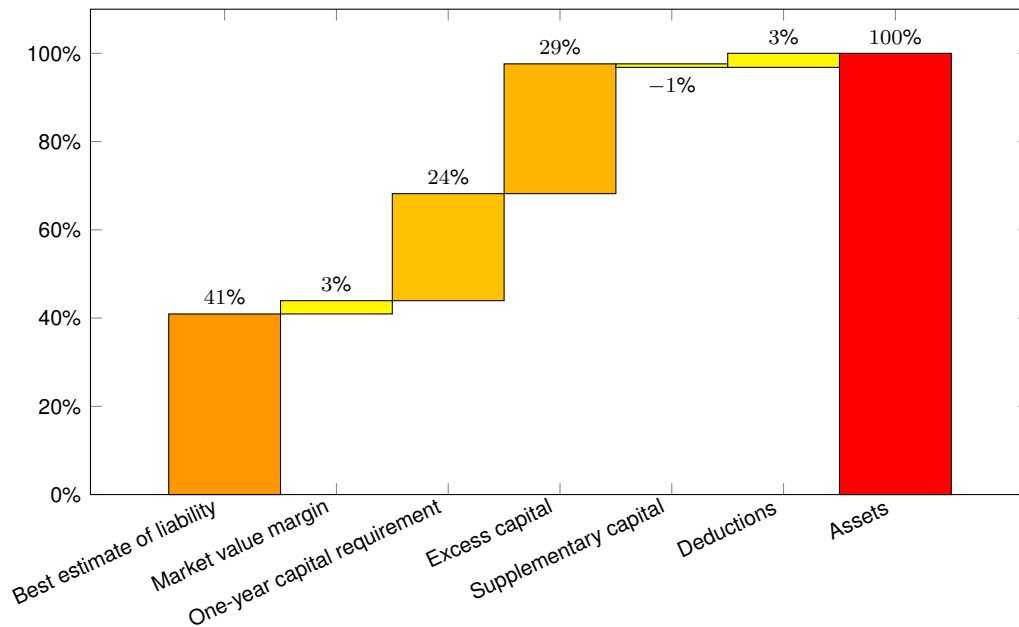


Figure 28a: Reinsurance (mean values)

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

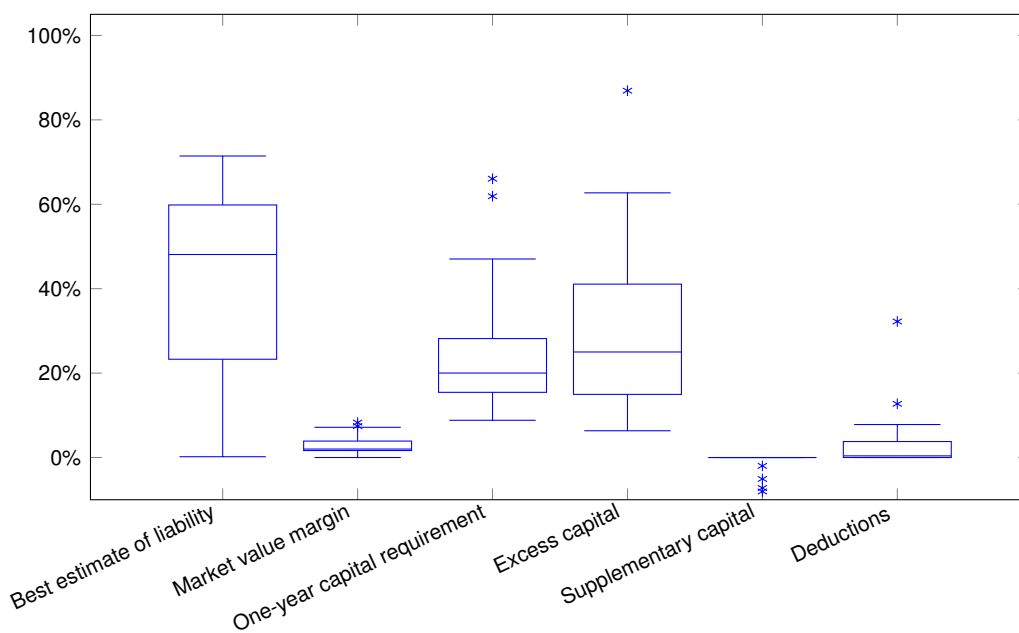


Figure 28b: Reinsurance (distribution)

Best estimate of liability and target capital in relation to the balance sheet total (categories 2 and 3)

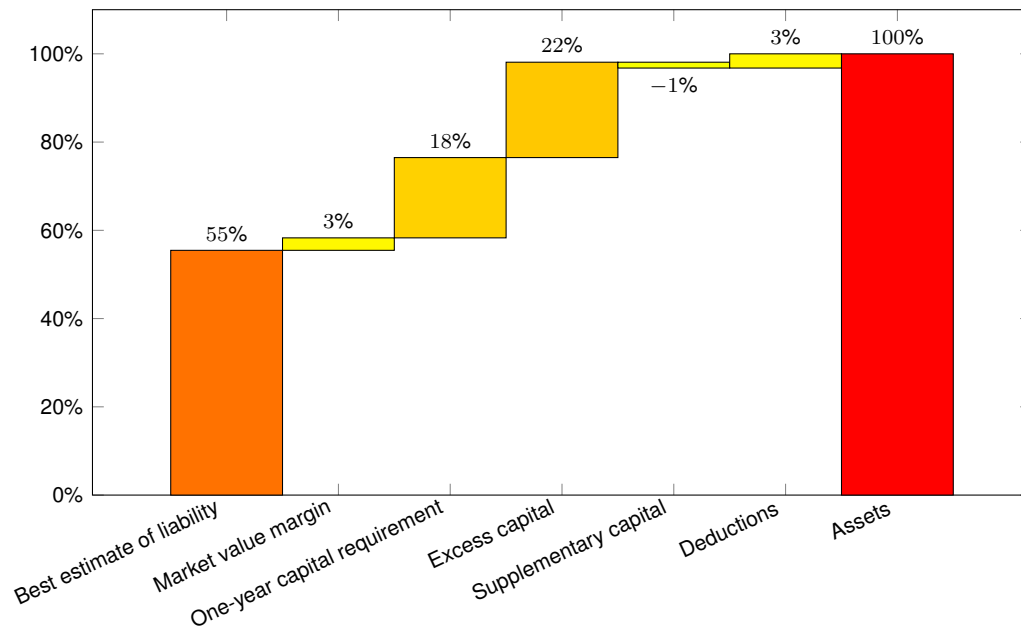


Figure 28c: Reinsurance (mean values)

Best estimate of liability and target capital in relation to the balance sheet total (categories 4 and 5)

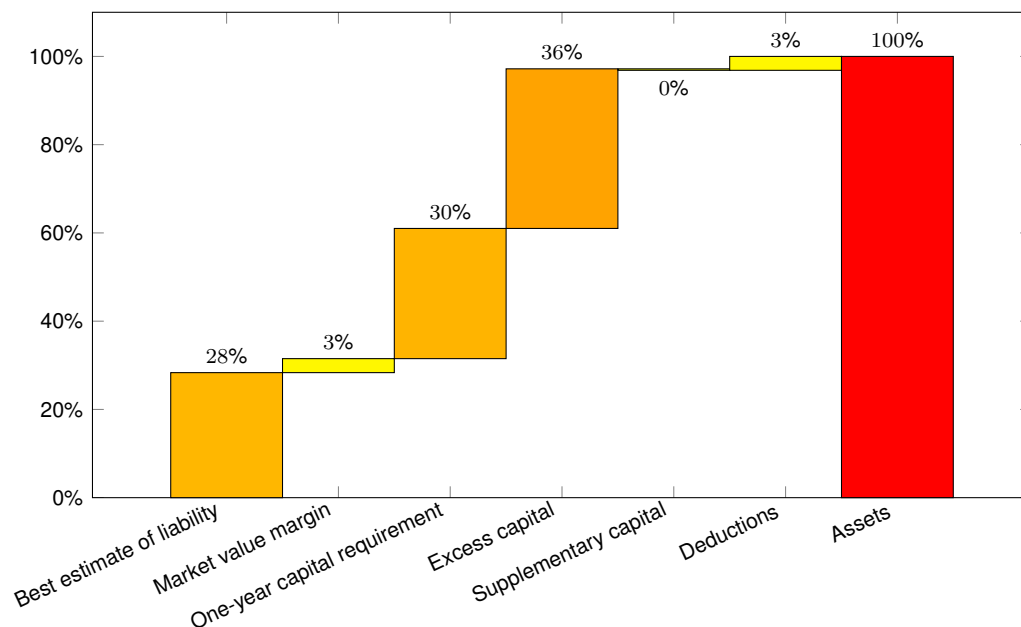


Figure 28d: Reinsurance (mean values)

## 6.6 Target capital decomposition

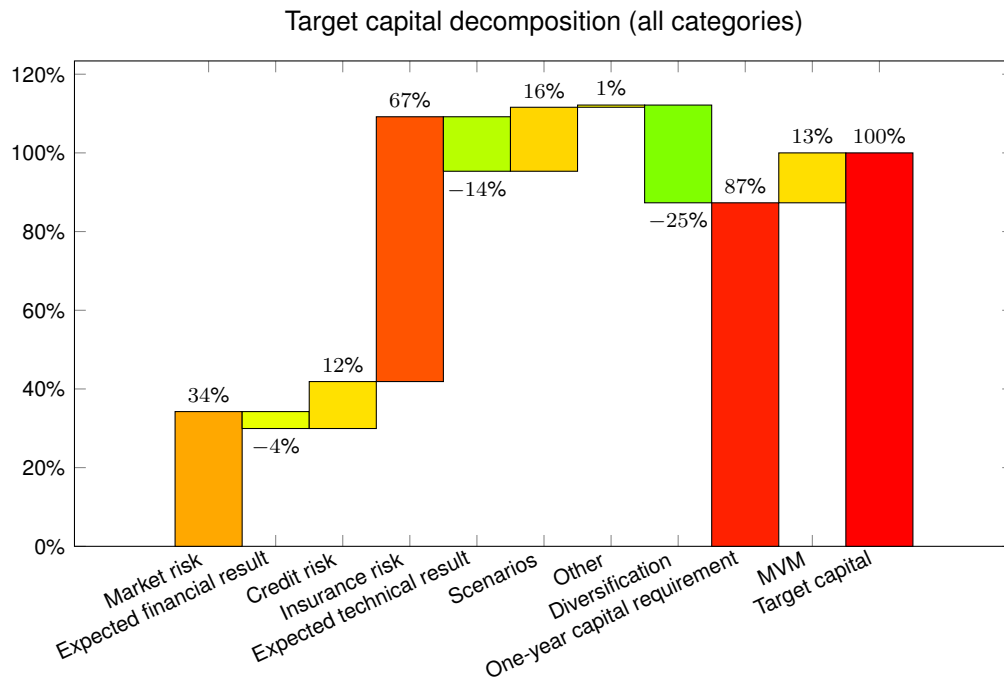


Figure 29a: Reinsurance (mean values)

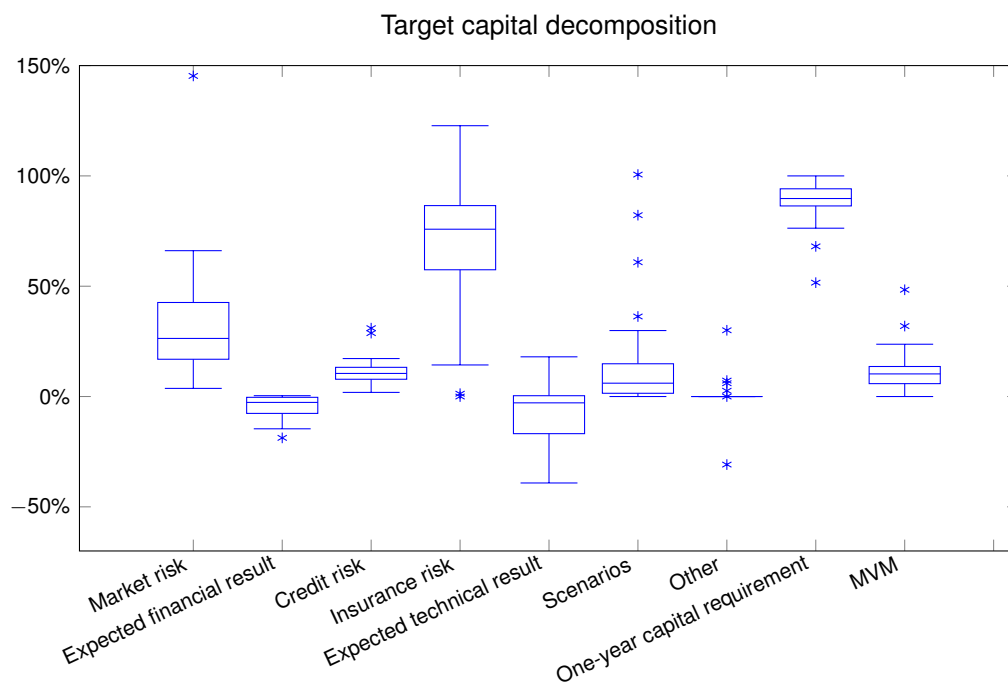


Figure 29b: Reinsurance (distribution)



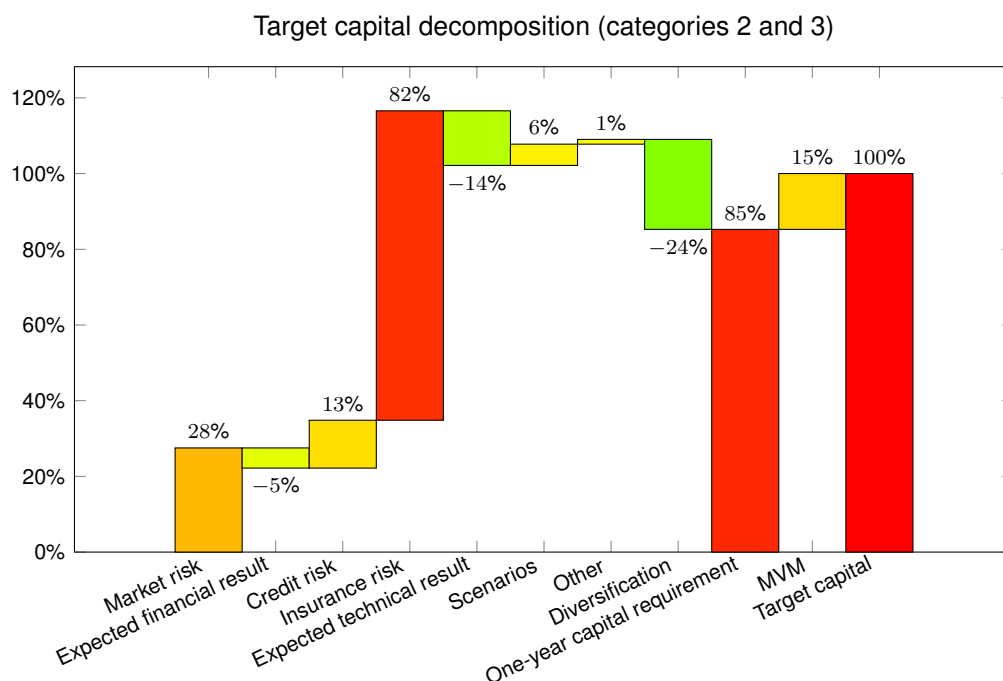


Figure 29c: Reinsurance (mean values)

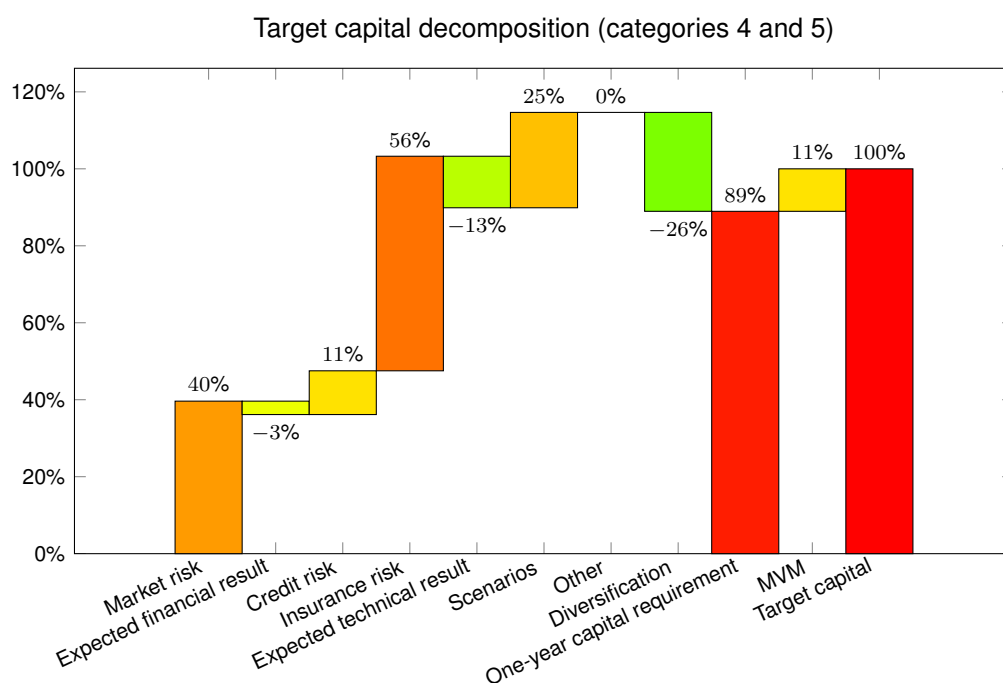


Figure 29d: Reinsurance (mean values)

## 6.7 Market risk analysis

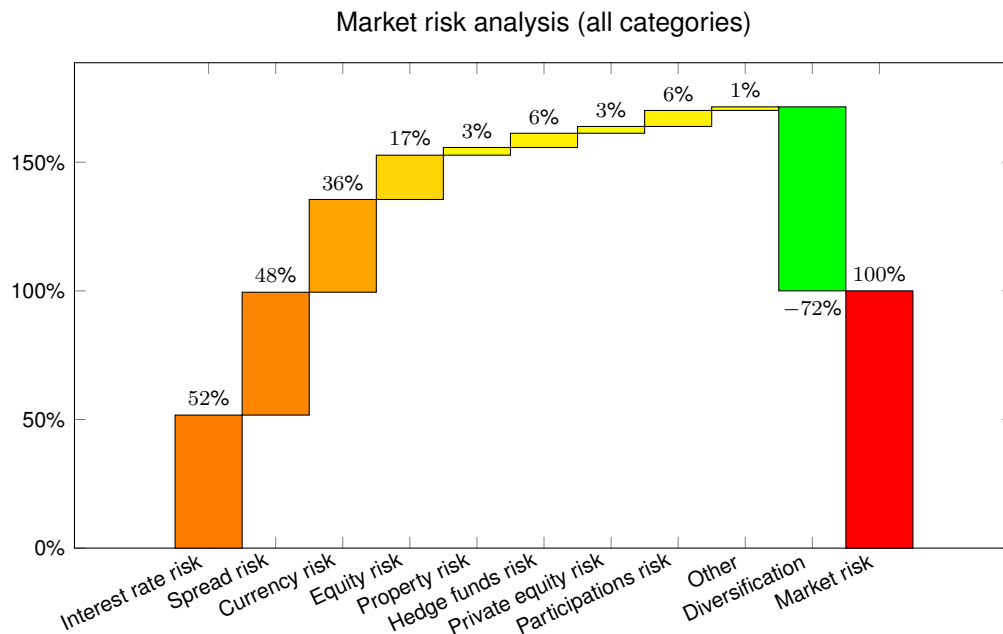


Figure 30a: Reinsurance (mean values)

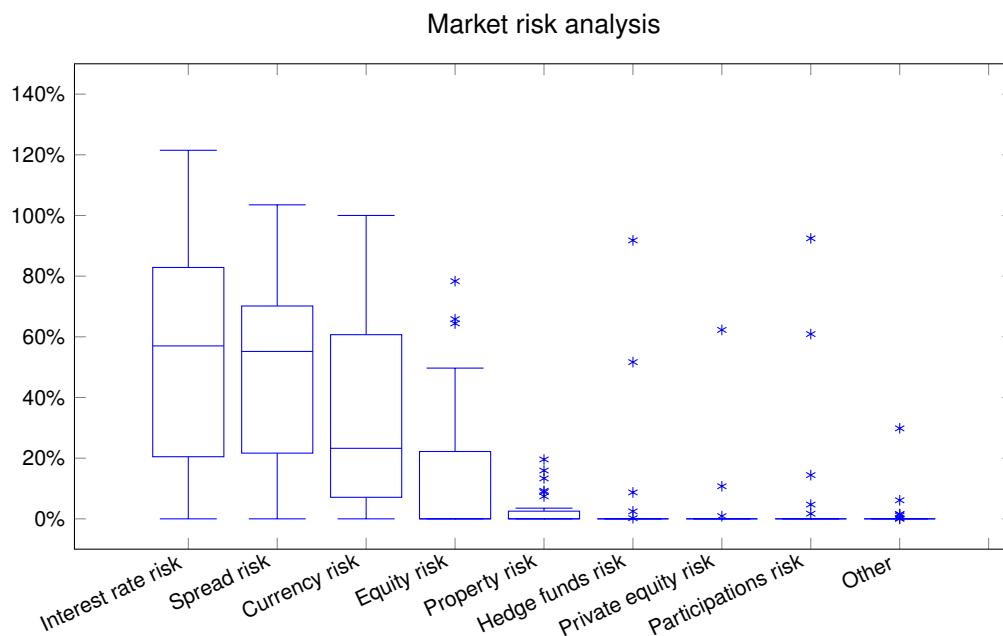


Figure 30b: Reinsurance (distribution)

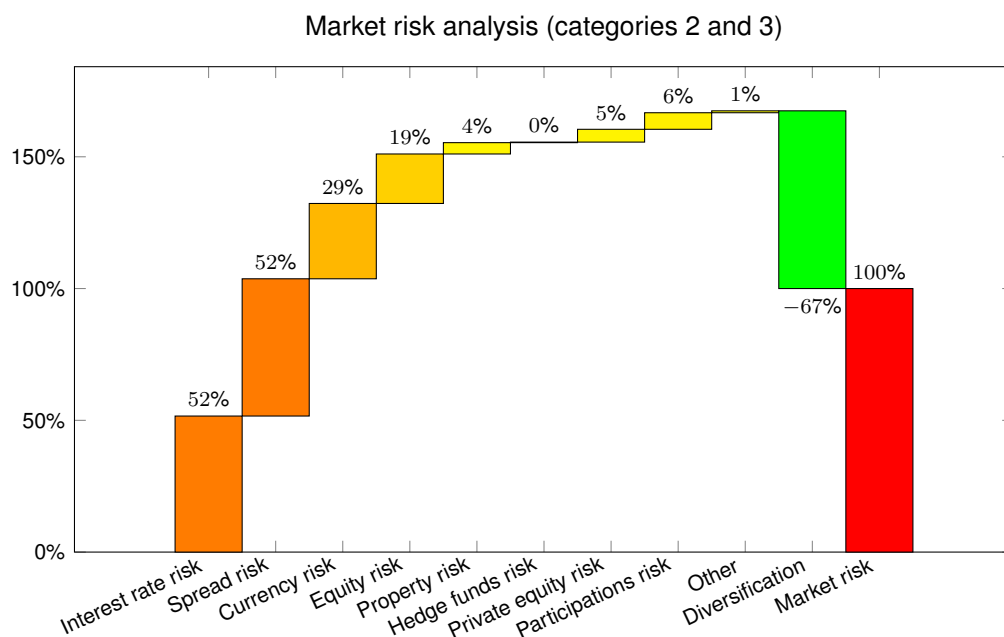


Figure 30c: Reinsurance (mean values)

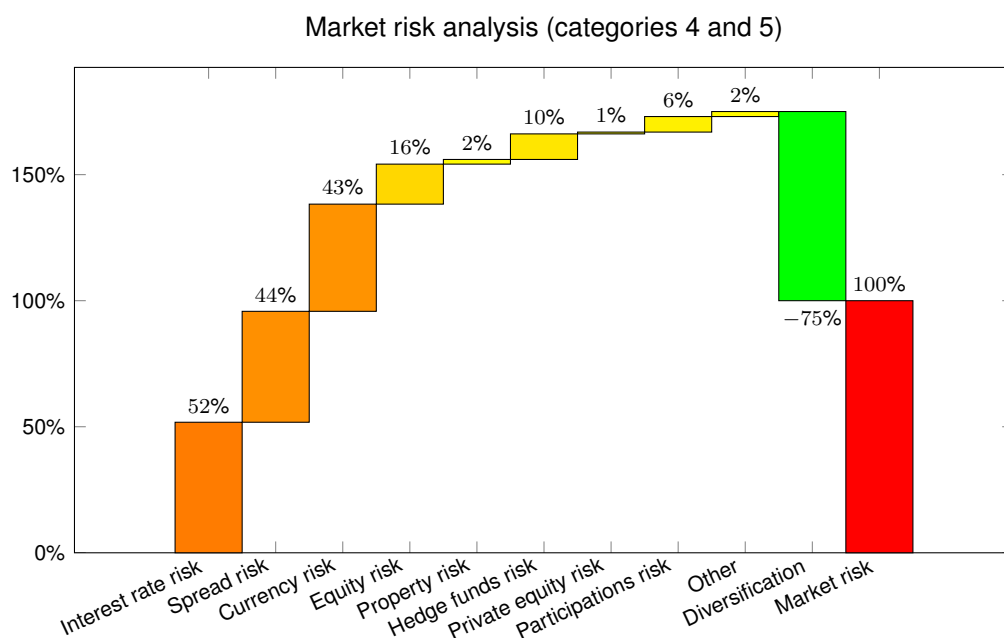


Figure 30d: Reinsurance (mean values)

## 6.8 Interest rate analysis

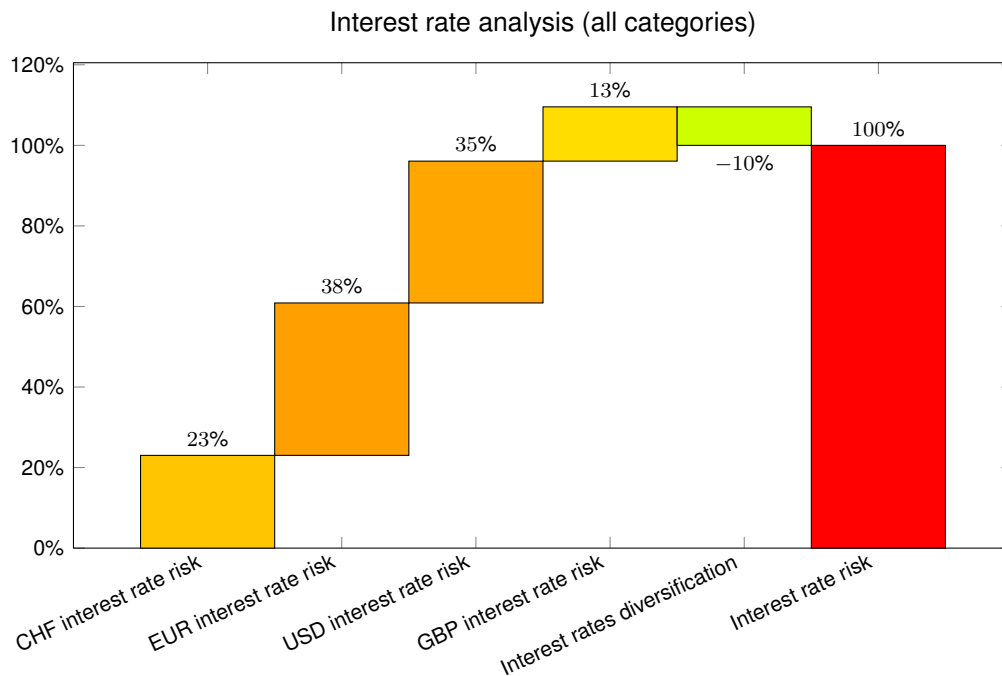


Figure 31a: Reinsurance (mean values)

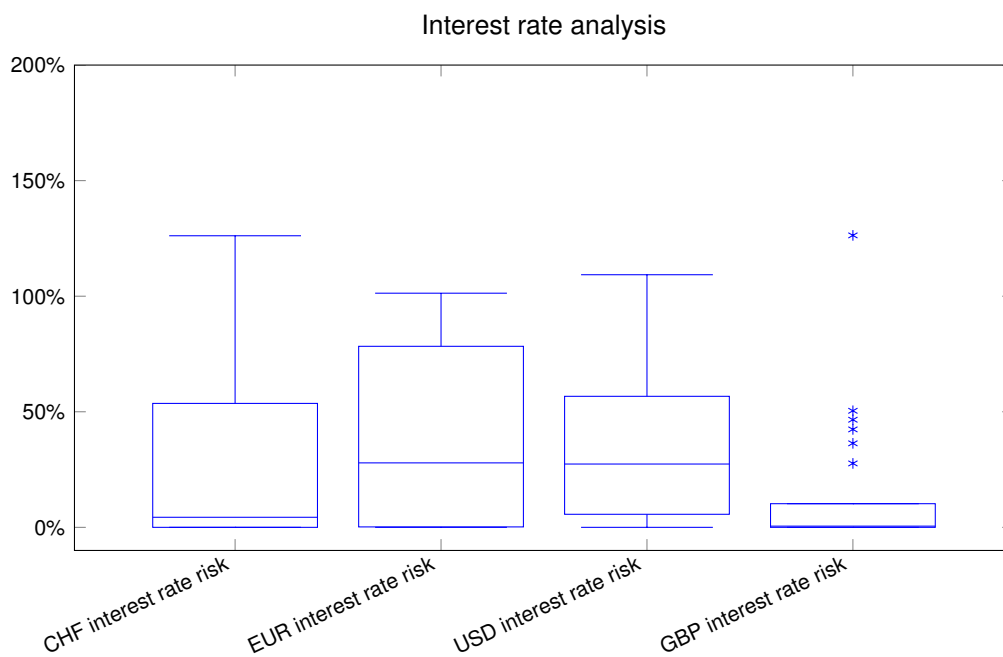


Figure 31b: Reinsurance (distribution)

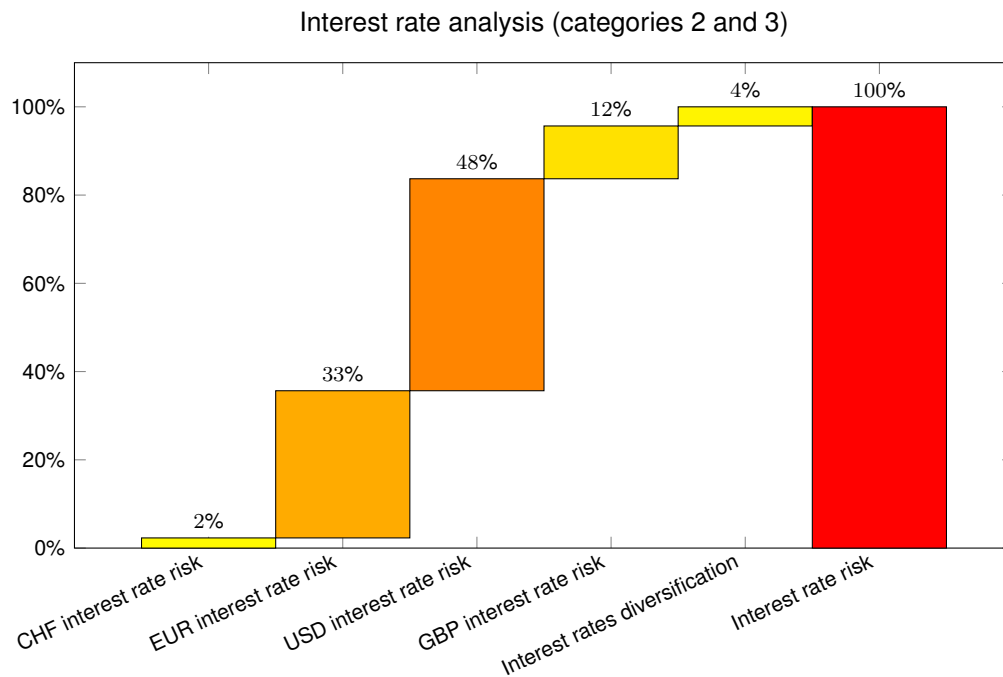


Figure 31c: Reinsurance (mean values)

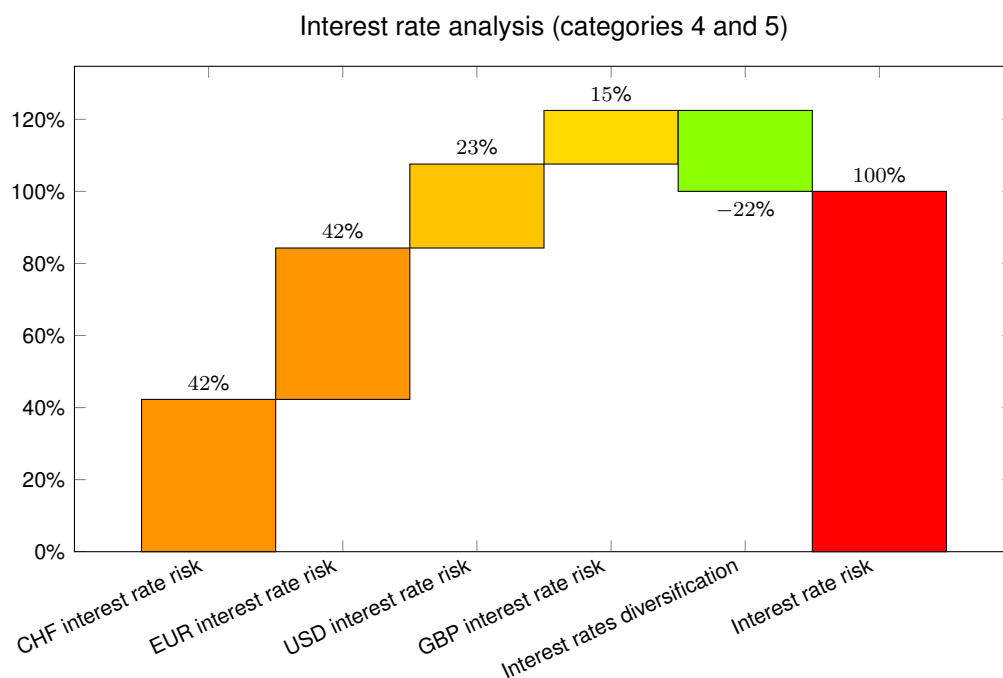


Figure 31d: Reinsurance (mean values)

## 6.9 Market and credit risk scenarios

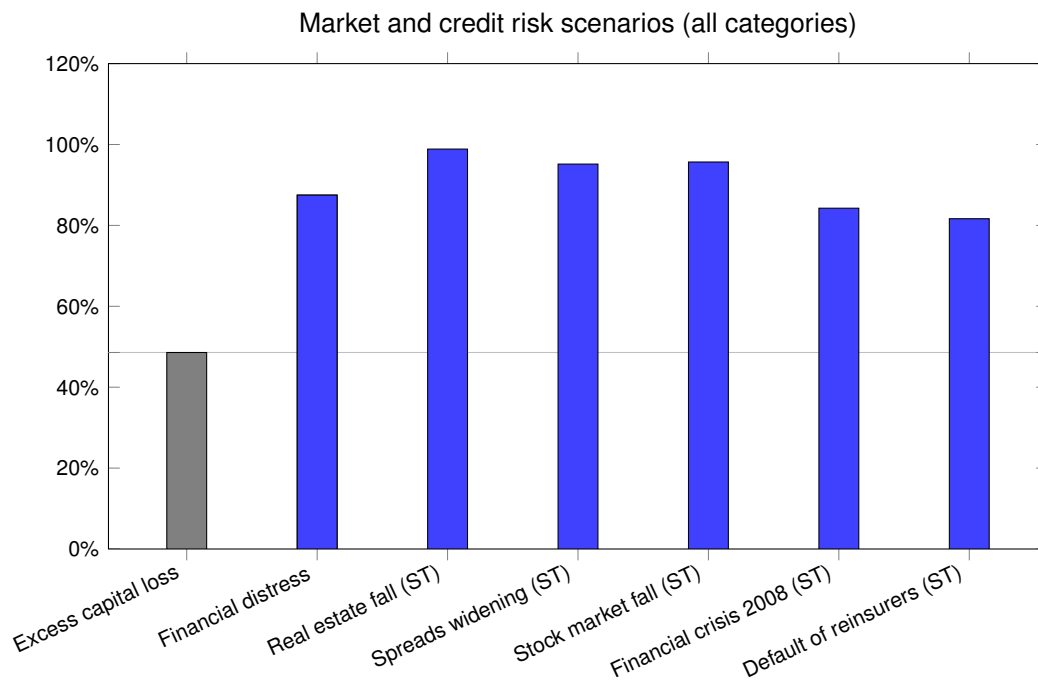


Figure 32a: Reinsurance (mean values)

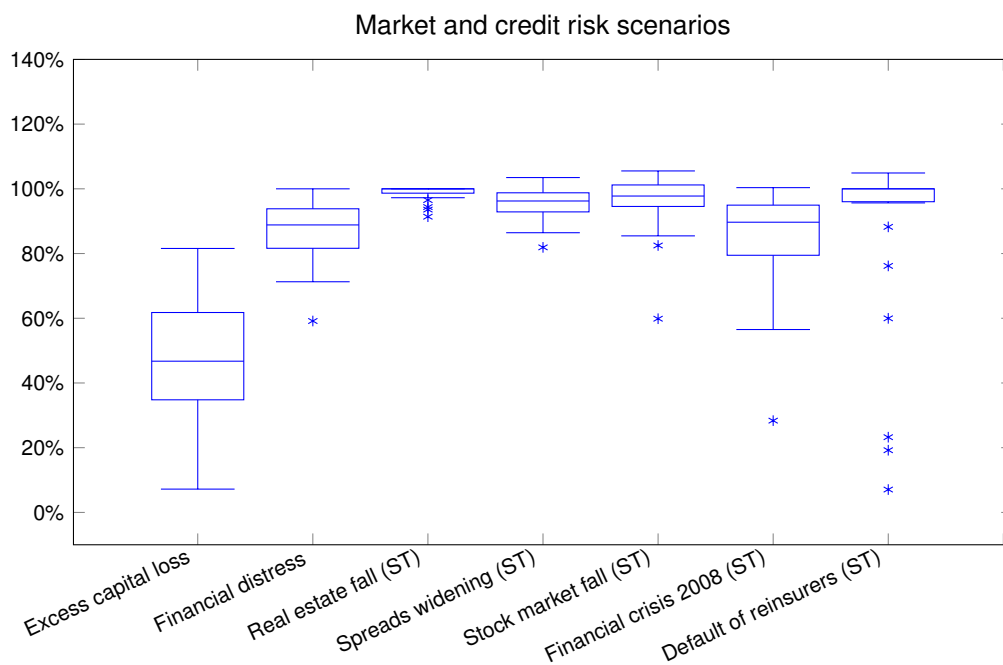


Figure 32b: Reinsurance (distribution)

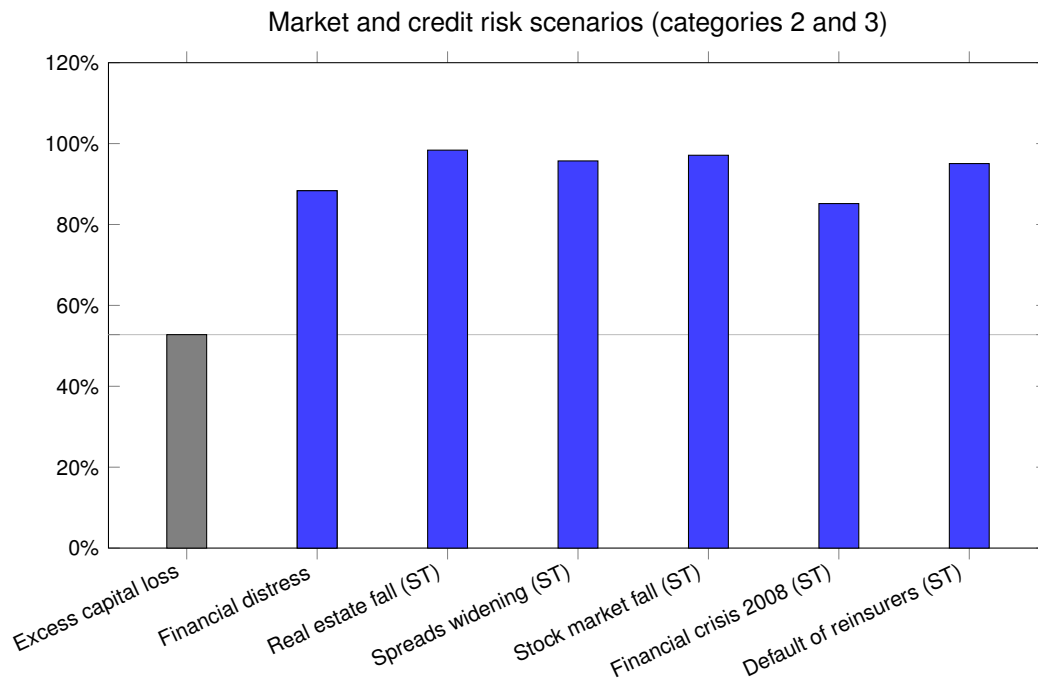


Figure 32c: Reinsurance (mean values)

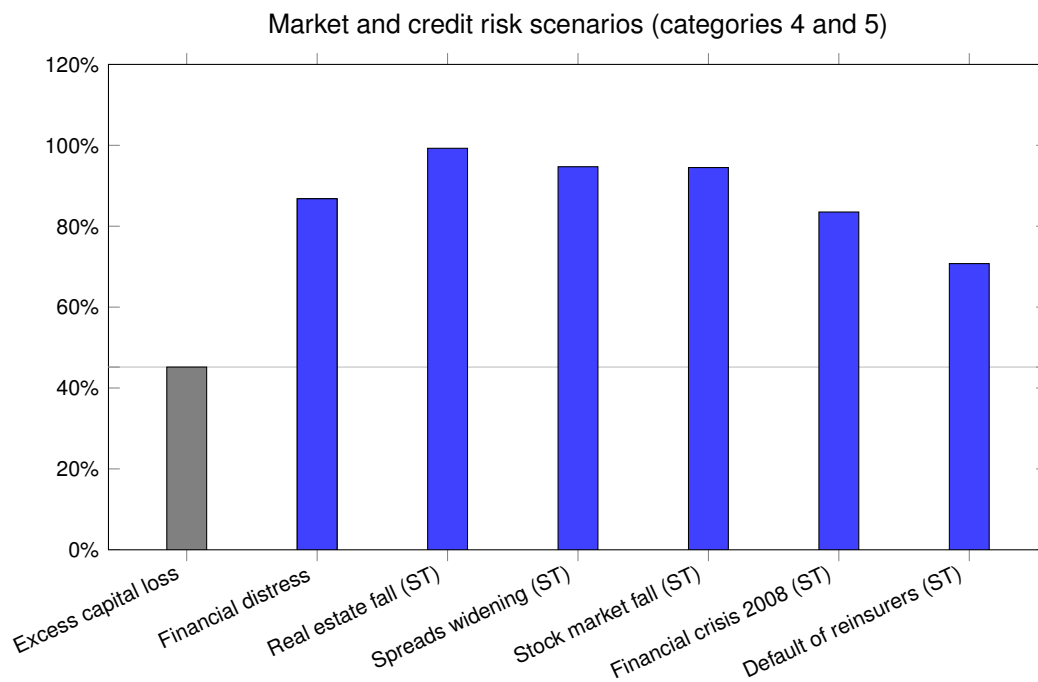


Figure 32d: Reinsurance (mean values)

## 6.10 Insurance risk and global scenarios

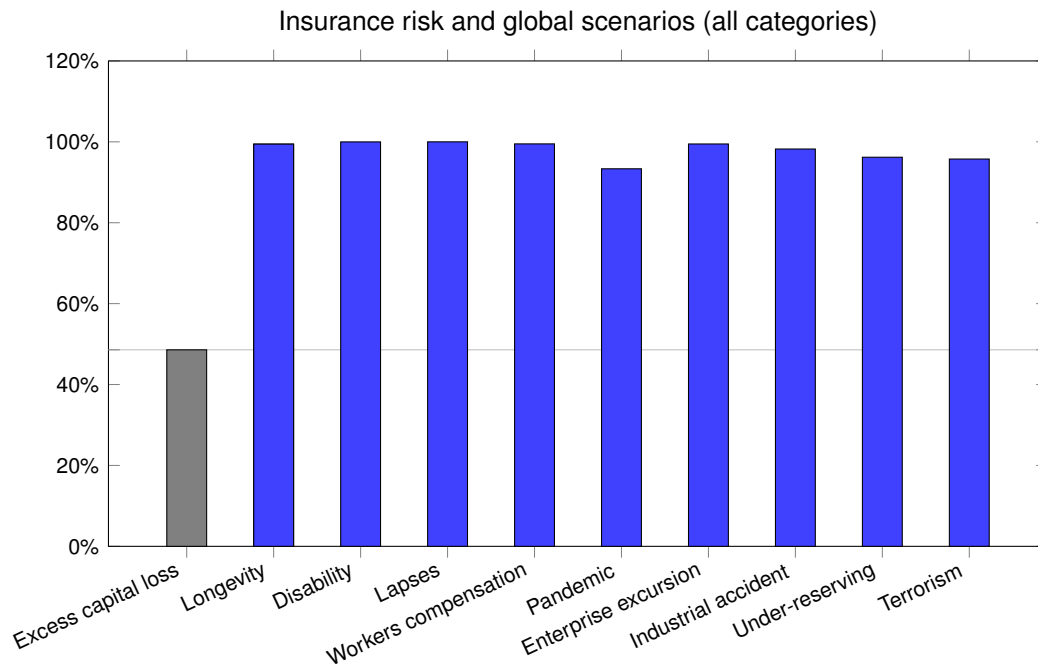


Figure 33a: Reinsurance (mean values)

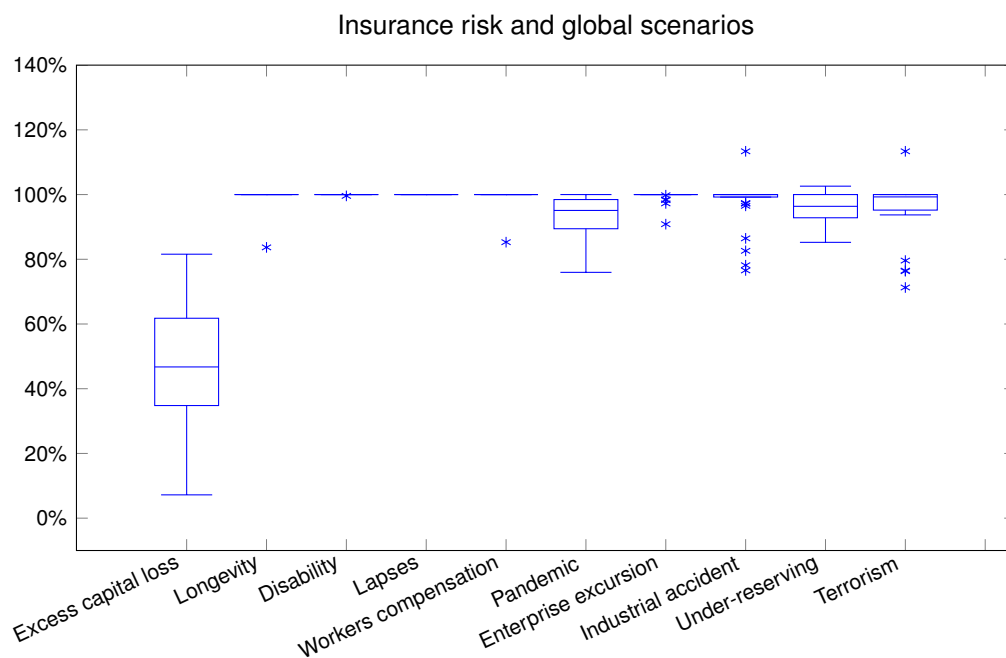


Figure 33b: Reinsurance (distribution)



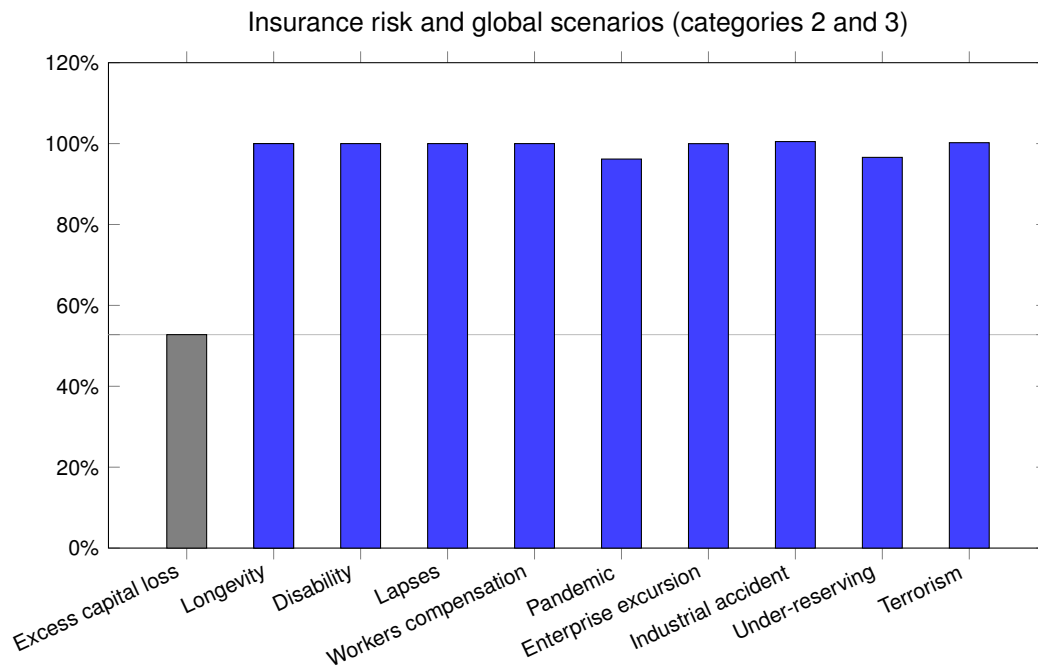


Figure 33c: Reinsurance (mean values)

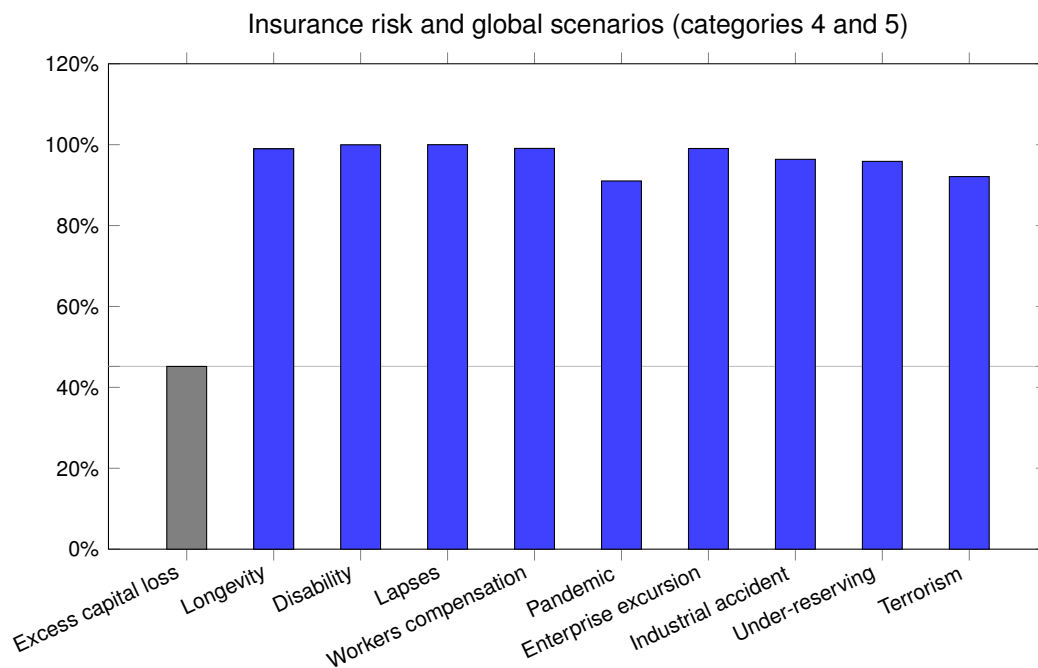


Figure 33d: Reinsurance (mean values)

## A Glossary for figures

In the following Appendix, the risk will be 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 liability and target capital in relation to the balance sheet total

Best estimate liability	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 that 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 <math>1 - \alpha</math>, 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 <math>1 - \alpha</math> 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>

Premium risk	<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>
Risk-bearing capital	<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>
Risk-free interest rate	<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>
Risk-free yield curve	<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>
Risky yield curve	<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>