

**Switzerland: Financial Sector Assessment Program—
Technical Note—Insurance Sector Stress Testing**

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SWITZERLAND

TECHNICAL NOTE:

INSURANCE SECTOR STRESS
TESTING

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I. INTRODUCTION

1. Switzerland is an established insurance center, well served by large and sophisticated insurers. As at 31 August 2006, there were 214 (re)insurers—23 Swiss life insurers, 4 foreign life insurers, 78 Swiss non-life insurers, 40 foreign non-life insurers, and 69 reinsurers active in the Swiss market. Switzerland has the highest per capita expenditures for insurance in the world. Swiss insurers are also significant international players, with more than 70 percent of the sector's global premiums sourced from abroad. The Swiss insurance market is highly concentrated, with the 5 largest non-life insurers accounting for 72 percent of gross premium written while the 5 largest life insurers account for 82 percent of the premium earned. Swiss Re, European Re and Converium consistently maintain about 79 percent share of the Swiss reinsurance market. Exits from the market had been orderly and new niche players have been attracted to enter the market, in the absence of restrictive entry barriers.

2. This note presents the results of the stress tests conducted in the context of the Switzerland November 2006 FSAP update.¹ The results described below suggest that there are market risks inside some Swiss insurance entities that may need focused attention. In particular, a moderate correction in share and property values, with interest rates ending somewhat lower than the prior cyclical lows, *could cause distress to five out of nine life insurers, two of twelve non-life insurers and two of nine health insurers* that participated in the 2006 Swiss Solvency Test (SST) field tests.² This suggests the need for focused inspection of those insurers that appear to be exposed to significant losses from such a moderate event potentially leading to an agreement to increase financial (capital) resources or to a reduction in risk exposures. Similar focused inspections should be conducted next year once reinsurers and the balance of direct insurers have commenced reporting under the SST.

II. STRESS TEST SCENARIOS AND CONSIDERATIONS

A. Scenario Description

3. The Federal Office of Private Insurers (FOPI) simulated the effects of an integrated scenario for a modest global recession on the 30 direct writing insurers that participated in the 2006 SST field tests. The simulated effects were based on results obtained from the 2006 SST field tests. Reinsurers will not participate in the SST process until next year.

¹ Prepared by Paul McCrossan (Insurance/actuarial expert).

² It should be noted that the SST field tests were conducted on a legal entities basis and do not take account of any existing capital and risk transfer instruments within a group.

Participating companies included nine life insurers, twelve non-life insurers, and nine health insurers.

4. In the short-term, the main downside risks for the Swiss financial sector appear to be mainly driven by external factors such as a disorderly unwinding of global imbalances that would put further pressure on U.S. interest rates, inducing a potentially severe drop in global equity markets and turbulence in financial markets complicated by a hard landing of housing markets in the US and other key industrial countries, feeding back into real economic activity. Table 1 presents the average asset concentration for non-life, life, and health insurance companies as of end-2005. The data indicate significant interest rate exposures (through exposure to bonds) and also moderate exposures to real estate, equities, and investment funds. For purposes of stress testing insurers, the incremental effects of five changes were examined. These changes were applied to companies' portfolios overnight:

- A fall in interest rates (I.R.) by 25 bps (short-end) to 75 bps (long-end) lower than the low in the last economic cycle (Table 2);
- A widening of credit spreads by 50 bps (half the amount used in the 2006 SST stress test) as a “flight to quality” in the bond market;
- An increase of 20 percent in the value of the Swiss franc, euro and British pound against the U.S. dollar;
- A 30 percent fall in international equity markets; and
- A 20 percent fall in the value of real estate.

5. It should be emphasized that these changes do not represent a forecast. Rather, they constitute a set of plausible market changes that are considered for the purpose of examining both risk concentration in the Swiss insurance sector and resiliency to adverse financial developments. The effects of the five changes in the global recession scenario are measured in two different ways:

- As a percentage of the actual risk-bearing capital (RBC) of the 30 insurers; and
- In terms of the reduction (in Swiss francs) in the RBC of the 30 insurers.

Table 1. Average Asset Concentration for the Insurance Industry
(in percent of total assets, end-2005)

	Non-Life	Life	Health	Industry
Real Estate (including own property and mortgage loans)	15.0	18.1	1.3	12.8
Bonds	38.6	37.8	48.2	41.7
Equities	7.4	4.3	14.6	8.4
Investment funds	11.4	2.4	11.4	8.5
Hedge Funds	0.8	1.2	0.5	0.9
Private Equity	0.2	0.2	0.1	0.2
Derivatives	0.0	0.1	0.7	0.2
Other assets	26.6	35.8	23.2	27.3

Source: Federal Office of Private Insurance.

Table 2. Lowest Interest Rates in the Last Economic Cycle for Major Currencies 1/

	O/N	1M	3M	6M	1Y	2Y	3Y	5Y	7Y	10Y	20Y	30Y
US\$	1.25	1.16	1.11	1.09	1.13	1.33	1.58	2.30	2.87	3.37	4.36	...
UK £	3.75	3.71	3.68	3.60	3.33	3.29	...	3.78	...	4.17
EURO	...	2.56	2.41	2.31	2.23	2.49	...	3.21	...	4.09
SwF	...	0.24	0.28	0.32	0.40	0.60	0.90	1.43	1.85	2.36	3.34	3.81

Source: Federal Office of Private Insurance.

1/ The rates for the US\$ and the SwF are for May 30, 2005. Rates for the UK £ and the Euro are for February 28, 2003.

B. Market Risk Considerations

6. The assumptions on market risk would be expected to affect the companies' portfolios in the following way:
 - a. A fall in interest rates will be adverse for insurers whenever the term of the liabilities is longer than the term of the assets. This could arise because of a deliberate investment decision to buy assets that are of a lesser term than the expected term of the liability cash flows or because marketable assets for long term liabilities are not readily available. It could also arise because the assumed decrease in interest rates would mean that certain guarantees or options contained in the policies became more demanding in a lower interest rate environment. For example, a guarantee to pay policyholders at least 3 percent will be a drain on insurer financial resources if interest rates available from investments are 2 percent rather than if interest rates available from investments exceeded 3 percent.

- b. A widening of the credit spreads when there is market turbulence will disadvantage insurers with lower quality assets (say A or BBB corporate bonds) compared to those with higher quality assets (say federal government or AAA corporate bonds) since the lesser quality bonds will be in relatively lesser demand.
 - c. An increase in the Swiss franc relative to the U.S. dollar will be more disadvantageous to those insurers that have more than the U.S. dollar currency liabilities proportion invested in U.S. dollars.
 - d. A decrease in equity markets will relatively disadvantage those insurers that have the greatest proportionate investments in equities.
 - e. A decrease in real estate markets will relatively disadvantage those insurers that have the greatest proportionate investments in real estate.
7. Each insurer will choose to reduce or increase its investment market risks according to its assessment of the advantages or disadvantages of various investment strategies. There is nothing wrong with “high risk, high reward” investment strategies if the insurer is sufficiently well capitalized to withstand adverse market developments. However, the less well capitalized the insurer is, the less it meets financial regulatory prudential objectives when it increases its market risks. *This suggests that standards or guidelines with respect to RBC capacity to reflect market risk exposure to illiquid, volatile or low quality assets need to be developed and enforced.*

III. STRESS TEST RESULTS

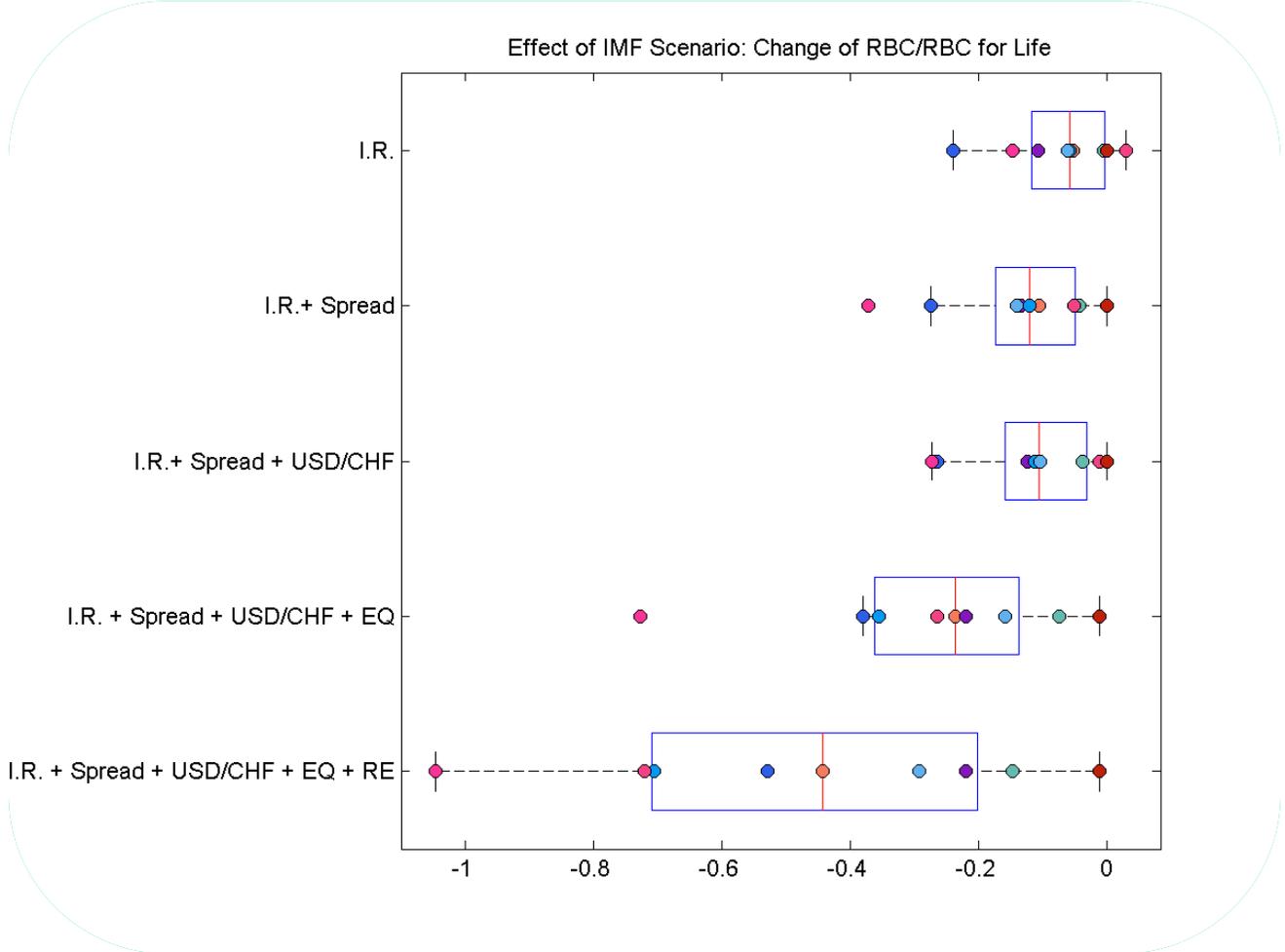
A. Life Insurance

8. The results of the stress tests were as follows (Figure 1):³
- a. With respect to interest rate term mismatch, one life insurer has risked a small portion of its RBC to protect against an interest rate rise, two insurers have taken a relatively neutral position, and six insurers have risked a portion of their RBC if interest rates fall. Of these, the two most insurers with the largest asset and liability term mismatch would have losses of about 20 percent of their RBC if interest rates fell to the level assumed in the scenario.

³ Circles in figure represent individual insurance companies. The vertical redline in the middle of the boxes represent the median company. The boxes represent the central two quartiles (i.e. those companies that lie between the 25% and the 75% quantile points) and can be viewed as representative of “typical” insurer performance. The horizontal axis shows the change in RBC as share of pre-stress RBC (for example, -1 denotes a decrease by 100 percent of capital).

- b. With respect to the investments in lower quality investments, the two life insurers that took the largest interest rate term mismatch risk also invested in the lowest quality fixed interest investments. These two insurers would experience distress due to cumulative losses of between 30-40 percent of RBC if credit spreads also increased.
 - c. With respect to currency mismatch risk, most life insurers maintain a relatively neutral stance although the one insurer that has the greatest currency mismatch risk is the insurer that has taken the greatest combined interest rate and credit spread risk. While the scenario tested is favorable to this life insurer, mismatches of all types bear regulatory scrutiny. However, under the scenario where the Swiss franc rises against the US dollar, this reduces the mismatched insurer's cumulative loss of RBC to 30 percent .
 - d. Many Swiss life insurers have significant investments in the relatively volatile equity market. A correction in the equity markets of 30 percent as a reaction to a global recession would cause the insurer with the riskiest investment strategy to experience significant distress by losing over $\frac{2}{3}$ of its RBC and two additional insurers would experience distress by losing over $\frac{1}{3}$ of their RBC.
 - e. Most Swiss life insurers have investments in the relatively illiquid real estate market. A correction of 20 percent in real estate markets would result in three insurers experiencing significant financial distress by losing over two-thirds of their RBC (of which one would be bankrupt) and an additional two insurers would experience financial distress by losing over one-third of their RBC.
9. The most interesting observation from the scenario testing is that the insurer that might become bankrupt under the scenario tested is the insurer that took the largest market risk concentration in every one of the areas tested; i.e., that insurer has adopted a "very high risk for very high reward" investment strategy and does not appear to have the RBC to assume the risks it has taken. Similarly, the four life insurers that do not experience financial distress are insurers that have not taken an aggressive investment strategy in any one of the areas tested.
10. Finally, of the remaining four life insurers that would experience financial distress or significant financial distress under the global recession scenario, all have well above average exposures to the relatively illiquid real estate sector and two of the four also have high exposure to the relatively volatile equity markets.

Figure 1. Stress Test Results for Life Insurance



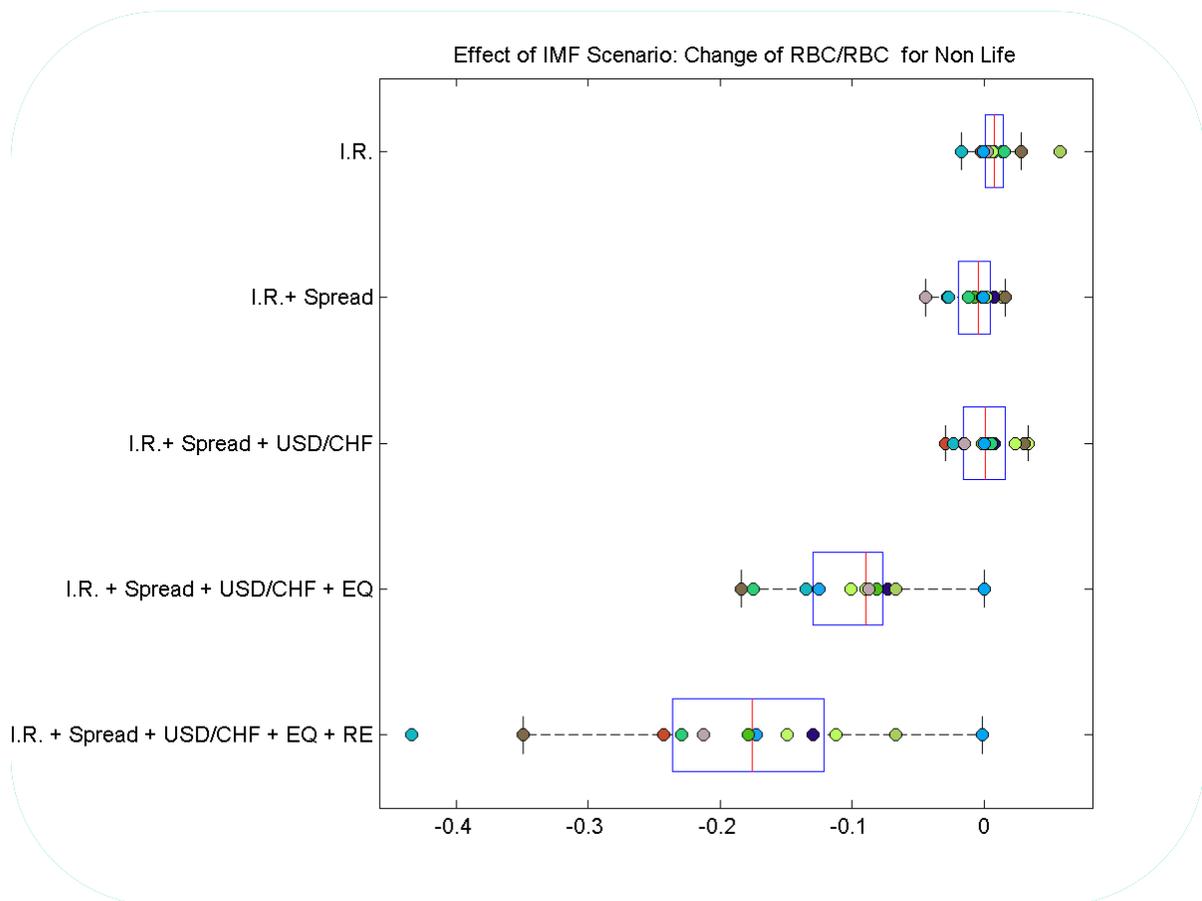
11. These scenario analyses point to the need for FOPI to develop risk bearing standards or guidelines for life insurers with respect to exposure to market risk. It is questionable whether any life insurer in a well regulated industry should be able to assume such aggressive investment postures in every investment area tested as the one insurer that would become bankrupt under the global recession scenario.

12. Similarly, further analysis should be undertaken with respect to the four remaining life insurers that would experience financial distress under the global distress scenario to assess the extent to which they could either reduce their risk profiles or secure access to increased capital. This analysis might contribute to the development of industry-wide risk bearing standards or guidelines for life insurers with respect to market risks.

B. Non-life Insurance

13. The results of the stress tests on non-life insurers were as follows (Figure 2):
- Only one non-life insurers tested have assumed a significant interest rate risk and this insurer is only modestly vulnerable to an interest rate rise.
 - Non-life insurers do not seem to have assumed major credit spread risk.
 - No non-life insurers have assumed a major currency risk.
 - While almost all non-life insurers have exposure to equity risks, only two might be judged to have taken a major equity risk relative to their RBC.
 - While non-life insurers have significant exposure to real estate risks, the two with the highest risk concentration in real estate also have the highest concentration in equity risk.

Figure 2. Stress Test Results for Non-Life Insurance



14. Overall, only two non-life insurers would experience financial distress (losing more than one-third of their RBC) under the global recession scenario. Both insurers have the highest relative exposure to the relatively illiquid real estate market and the volatile equity market.

15. Further analysis should be undertaken with respect to these non-life insurers to assess the extent to which they would become financially distressed and the extent to which the insurers could reduce their risk profiles or secure access to additional capital. This analysis might contribute to the development of industry-wide risk bearing standards or guidelines for non-life insurers with respect to market risks.

C. Health Insurance

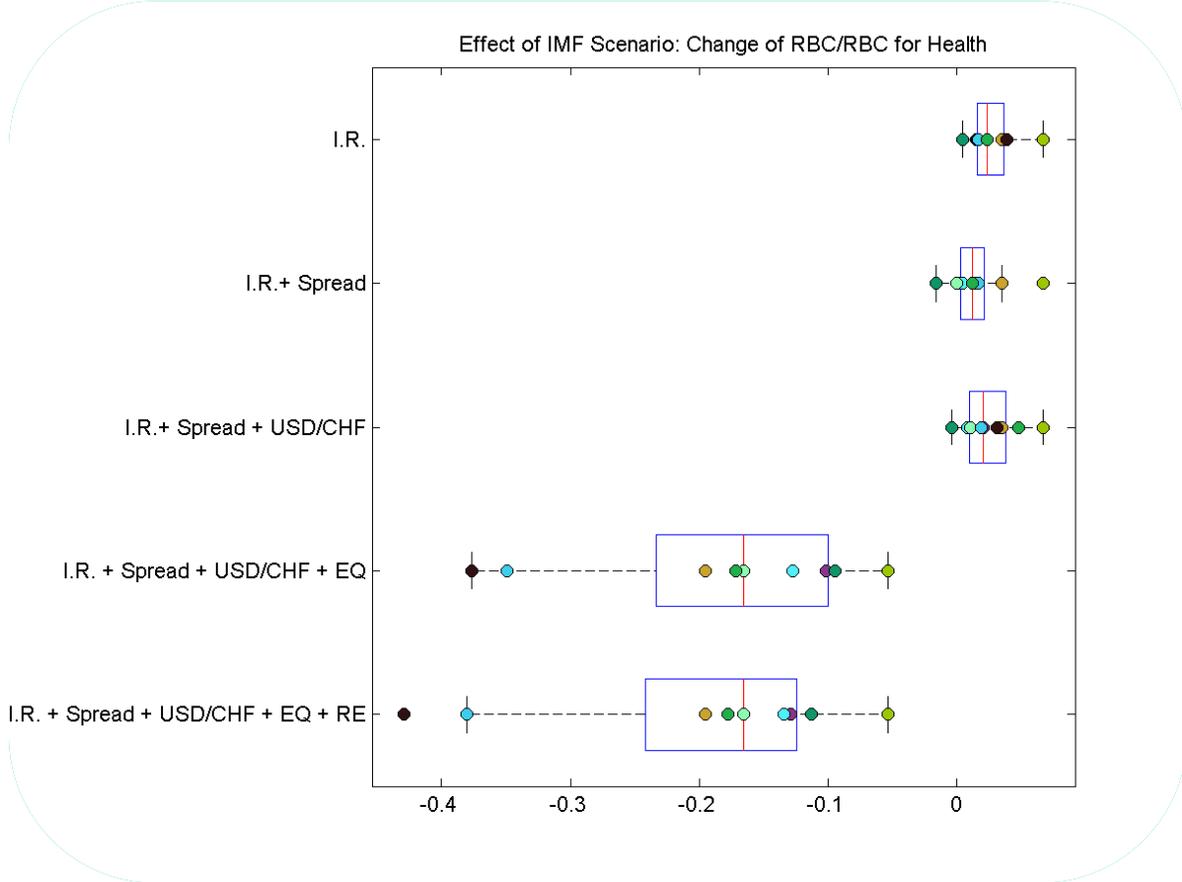
16. The results from the stress tests were as follows (Figure 3):

- a. No health insurers participating in the 2006 SST field tests have exposure to significant interest rate term mismatch risks, credit spread risk, or significant currency risk.
- b. Two health insurers have exposure to significant equity risk.
- c. The same two health insurers have exposure to significant real estate risks.

17. Overall, only two health insurers would experience financial distress (losing more than one-third of their RBC) under the global recession scenario. Both have among the highest exposure to the volatile equity markets and the relatively illiquid real estate markets.

18. Further analysis should be undertaken with respect to the two health insurers to assess the extent to which they would become financially distressed bearing in mind their current RBC situations to assess the extent to which the insurers could reduce their risk profiles or secure access to additional capital. This analysis might contribute to the development of industry-wide risk bearing standards or guidelines for health insurers with respect to market risks.

Figure 3. Stress Test Results for Health Insurance



D. Overall Observations from Stress Test Results

19. All insurers that would experience financial distress have well above average exposure to the real estate markets and almost all of these also have above average exposure to the equity markets.
20. A strong majority of insurers that participated in the 2006 SST field test would appear to handle well the stress resulting from a global recession of the magnitude tested. However, exposure to illiquid assets, volatile assets and lower quality assets could lead to distress, sometimes significant.
21. Consideration needs to be given to whether the FOPI should bring in risk-bearing standards or guidelines with respect to market risk that link the market risks assumed to the RBC capacity of the insurers.
22. The FOPI staff were very adept at modifying the SST software to perform the global recession scenario testing. Analysis was usually performed in at least a day – and sometimes within hours of suggested changes. This suggests that the FOPI staff have the

adequate tools to meaningfully discuss the situation of those insurers that are exposed to significant risk of financial distress with senior management, or the Board, as appropriate.

IV. COMMENTARY ON OTHER SCENARIOS FROM THE 2006 SST FIELD TEST

23. The FOPI requested companies to submit stress results for other individual market scenarios based on reoccurrence of various historical market crises. While each of these scenarios led to different orders of distress in the insurance industry, similar issues to those raised by the global deflation scenario were generally raised.

24. In 2006, the FOPI also asked insurers for analysis of the effects of a global pandemic. For direct insurers, the largest risks appeared to be related to asset market turbulence rather than to additional insurance claims. This suggests that similar thinking as to risk-bearing guidelines that link the market risks assumed to the RBC capacity of the insurers that were raised in the global recession scenario testing should be undertaken by the FOPI.

25. However, for reinsurers, it might be expected that a global pandemic might have much more impact on insurance claims. This conclusion is tentative since reinsurers do not yet participate in the SST field tests. However, the large reinsurers have been trying to assess the impact of this risk. Expansion of the scenario testing to reinsurers in 2007 should help quantify the risks assumed.

26. The other major risky scenario that the FOPI asked the insurers to consider was a major terrorist act. To date, there is no one scenario that captures the risks borne by the different insurance segments. However, in a rapidly changing world, attention needs to be paid to the potential exposure to such risks.