



Guernsey Financial
Services Commission

STRESS TESTING OF THE GUERNSEY INSURANCE SECTOR

December 2011

1. Introduction

The Commission required certain insurance companies to carry out a stress testing exercise prior to the International Monetary Fund's ("IMF") assessment in 2010. The scenarios were set by the IMF and were limited to all commercial insurers and reinsurers. All companies other than captives were required to undertake this exercise in 2008 and it was repeated in 2010 for those companies where the 2008 exercise showed that their solvency level was particularly sensitive to the scenarios tested.

The Commission's regulatory objectives, which were recently restated by the States of Guernsey Policy Council, include a requirement to maintain financial stability in the regulated finance sector. The aim of the stress test exercise was to test whether the insurance sector in Guernsey would be able to meet the minimum margin of Solvency ("MOS") after applying prescribed asset-related and insurance-related shock scenarios, and an idiosyncratic catastrophe scenario for non-life companies.

2. Scope of the Exercise

The current exercise was limited to companies with a general insurance gross premium income of more than £15 million in their last financial year. Life companies and individual cells of protected or incorporate cell companies were included in the exercise if they had policyholder liabilities of over £50 million. Branches of life companies were excluded from the exercise since they do not have capital of their own. In total, 6 life companies and 22 non-life companies participated in the exercise.

3. Stress Test Scenarios

The Commission adopted a so called "bottom up" approach with individual insurance companies carrying out the tests themselves using scenarios set by the Commission. Two scenarios were tested for each market risk, a "baseline" scenario and an "adverse" scenario. A number of insurance and default risk scenarios were also tested. Participants were required to provide the results for each scenario in an Excel workbook provided by the Commission. The scenarios carried out are included in Appendix 1.

The Commission calibrated the scenarios taking into account the following sources of information:

- the 2010 stress test submitted to the IMF;
- the scenarios adopted by EIOPA in the 2010 year-end stress test; and
- the scenarios applied in the Solvency II, fifth Quantitative Impact Study.

The Commission has carried out a "top down" analysis of the solvency position of each participant following a baseline scenario and an adverse scenario. The market risk, credit risk and underwriting risk (both life and non-life) capital impacts were aggregated using a similar correlation approach as that applied for the Solvency II, fifth Quantitative Impact Study¹.

¹ The Commission calculated the capital impact of each scenario based on the excess of assets over liabilities but not including the impact on the minimum margin of solvency.

The Commission also required participants to carry out a “reverse” stress test. Reverse stress-testing is primarily designed to be a risk management tool, encouraging firms to explore more fully the vulnerabilities and fault lines in its business model. Participants were required to identify scenario(s) and circumstances that would result in the company not being viable, such as not being able to meet its statutory minimum margin of solvency requirement or stakeholders unwilling to transact with or provide capital to the company. The Commission chose not to provide guidance on the methodology and risks to take into account in assessing potential adverse scenario(s). Given the qualitative and quantitative nature of the exercise, participants were requested to provide details of the reverse stress test in narrative form.

4. Methodology

The tests were carried out on a best-effort basis using company data as at 30 June 2011. For any company with a year-end other than 31st December, the latest available data could be used.

For the purpose of the exercise, technical provisions were to be calculated on a realistic basis with prudential margins removed. This was to ensure that the financial position of the company was not understated and the impact of each scenario not overstated.

5. Results

5.1 Stress Test Results

For life participants, the current excess of assets over liabilities (and MOS) varied between 0.5% and 14.5%. For non-life participants, it varied between 0.3% and 783%.

The following table shows the number of companies that become insolvent following any one scenario occurring. The solvency position of the company is considered for each scenario in turn ignoring the capital impact of any other scenario.

Table 1 — Number of Companies Becoming Insolvent Following Individual Scenarios

Result	Life Companies	Non-Life Companies	Total
Remain Solvent	5	17	22
Become Insolvent	1	5	6
Total	6	22	28

Of the 28 participants, one life and five non-life companies showed negative solvency following an individual scenario. One commercial insurer with a significant investment in equities showed negative solvency if equities fell by 40% at the time of the test. Two non-life insurers would become insolvent if a catastrophe of their own calibration occurred. Three other non-life insurers would become insolvent if a catastrophe occurred and their reinsurers partially defaulted by 30%.

The following table shows the number of companies that become insolvent following a baseline scenario and an adverse scenario. The solvency position of the company is considered for each scenario allowing for the aggregate capital impact of other baseline or adverse scenarios.

Table 2 — Number of Companies Becoming Insolvent Following Aggregated Baseline and Adverse Scenario

Result	Individual Scenarios	Baseline Scenario	Adverse Scenario
Life Companies	1	0	1
Non-life Companies	5	5	5
Total	6	5	6

The table above shows the overall number of insolvencies did not change following the adverse scenario computed by the Commission. The limited impact on non-life companies of the baseline and adverse scenario reflects the mix of assets held. Each adverse scenario is twice the strength of the corresponding baseline scenario. However, as non-life entities have limited exposure to each baseline scenario, the impact of the adverse scenario is limited.

The following table shows the split of assets held by company type.

Table 3 — Split of Assets Held by Company Type

Asset Type	Life Companies	Non-Life Companies
Government Bonds	0.3%	1.5%
Non Government Bonds	32.9%	1.3%
Equities	59.2%	0.1%
Property	0.1%	0.0%
Cash	6.0%	76.5%
Other (including reinsurance recoverables)	1.5%	20.6%
Total	100.0%	100.0%

Around 97% of the assets of non-life participants are in cash or ‘other’ assets, which includes reinsurance recoverables. In contrast, around 92% of assets of life participants are in equity and non-government bonds.

The percentage change in the excess of assets over liabilities (including the MOS) for each scenario is shown in the following table. The table shows the lowest and highest percentage change as well as the median² change by participant type. The median is shown instead of the mean value to avoid distortions caused by extreme values.

² The median is the middle value; it separates the bottom and top half of a list of numbers.

**Table 4 — Percentage Change in Excess of Assets Over Liabilities
(Including the MOS) Following Individual Scenarios**

Scenario	Lowest	Median		Total	Highest
		Life	Non-Life		
I1: Baseline Interest Risk	-15%	0%	0%	0%	11%
I2: Baseline Spread Risk	-8%	0%	0%	0%	4%
I3: Adverse Interest Risk	-30%	-4%	0%	0%	21%
I4: Adverse Spread Risk	-17%	0%	0%	0%	9%
F1: Baseline FX Dep'n Risk	-7%	2%	0%	0%	40%
F2: Baseline FX App'n Risk	-36%	-2%	0%	0%	7%
F3: Adverse FX Dep'n Risk	-13%	3%	0%	0%	79%
F4: Adverse FX App'n Risk	-83%	-3%	0%	0%	13%
E1: Baseline Equity Risk	-66%	0%	0%	0%	0%
E2: Adverse Equity Risk	-132%	-1%	0%	0%	0%
P1: Baseline Property Risk	0%	0%	0%	0%	0%
P2: Adverse Property Risk	0%	0%	0%	0%	0%
L1: Mortality Risk	-1%	0%	0%	0%	0%
L2: As L1 with Partial Reinsurer Default	-20%	0%	0%	0%	0%
L3: Pandemic Risk	-11%	0%	0%	0%	0%
L4: As L3 with Partial Reinsurer Default	-25%	0%	0%	0%	0%
L5: Longevity Risk	-25%	-1%	0%	0%	0%
L6: As L5 with Partial Reinsurer Default	-45%	0%	0%	0%	0%
L7: Morbidity Risk	-3%	0%	0%	0%	0%
L8: As L7 with Partial Reinsurer Default	-20%	0%	0%	0%	0%
L9: Upward Lapse Risk	0%	0%	0%	0%	0%
L10: Downward Lapse Risk	0%	0%	0%	0%	0%
L11: Life Expense Risk	-21%	-4%	0%	0%	0%
G1: Catastrophe Risk	-348%	0%	-2%	0%	0%
G2: As G1 with Partial Reinsurer Default	<-9000%	0%	-12%	-4%	0%
G3: Non-life Expense Risk	-13%	0%	-1%	0%	0%

The above table shows the following broad results.

- The impact of each scenario on the median company is minimal.
- The impact of a rise in interest rates and credit spreads improves the financial position of one or more participants. Future stress tests may include additional scenarios such as the risk of falling interest rates and credit spreads.
- The impact of life and non-life scenarios is mitigated to a large extent by reinsurance. A 30% reinsurance default significantly compounds the impact of scenarios L1 L7 and G1.

The above table does not show the impact of a full or partial bank default. However, table 3 showed that non-life participants held around 77% of assets in the form of cash. Future stress tests may include an additional scenario such a partial bank default.

5.2 Reverse Stress Test Results

On the asset side, the most frequent scenario causing insolvency was a counterparty default on bank deposits, reinsurance assets and/or parental loans. Participants also described killer scenarios such as falls in equity values, exchange rate movements and a systematic financial industry meltdown leading to significant falls in bond values and money market assets.

On the liability side, life participants described expense, mortality, longevity, lapse and interest rate scenarios leading to insolvency. Non-life participants described catastrophes (such as terrorism, flood and earthquake) leading to a significant increase in claim payments and subsequent insolvency.

A number of life and non-life participants also described catastrophic operational risk and other failures. Some examples include fraud, embezzlement, reputation loss (causing the withdrawal of capital and/or insurance license), the investment manager deviating from investment strategy and poorly written policy documents.

6. Future Stress Test Exercises

Since the stress testing exercise is intended to test the strength of the insurance sector as a whole, going forward it will apply to all companies including captives. The Commission will require companies to undertake stress testing on a regular basis using a specified set of scenarios. In addition, companies will be required to carry out a reverse stress test. It is the intention of the Commission to repeat the stress test exercise in 2012.

APPENDIX 1 — STRESS TEST SCENARIOS

Interest rates

Baseline scenario

- Test I1:** An upward shift in Government bond yields of 1% at all durations.
Test I2: An increase in credit spreads over the Government bond yields as follows:

AAA	0.125%
AA	0.25%
A	0.3%
BBB	0.5%
BB	0.8%
B or lower or unrated	1.50%

Adverse scenario

- Test I3:** An upward shift in Government bond yields of 2% at all durations.
Test I4: An increase in credit spreads over the Government bond yields as follows:

AAA	0.25%
AA	0.5%
A	0.6%
BBB	1.0%
BB	1.6%
B or lower or unrated	3.0%

The above ratings refer to those given by Standard & Poors or an equivalent rating given by a recognised agency.

Foreign exchange rates

Baseline scenario

- Test F1:** The pound depreciates by 10 percent against all other currencies
Test F2: The pound appreciates by 10 percent against all other currencies

Adverse scenario

- Test F3:** The pound depreciates by 20 percent against all other currencies
Test F4: The pound appreciates by 20 percent against all other currencies

Equity prices

- Test E1:** Baseline scenario – a 20% fall in all equity values
Test E2: Adverse scenario – a 40% fall in all equity values

Property prices

Test P1: Baseline scenario – a 10% fall in all property values

Test P2: Adverse scenario – a 20% fall in all property values

Long term (life insurance) Risks

Test L1: Mortality: an increase in mortality rates at all durations of 15%

Test L3: Pandemic: a single event causing a one-off increase in mortality of an additional 1.5 deaths per 1000 during the next 12 months

Test L5: Longevity: a reduction in mortality rates at all durations of 20%

Test L7: Morbidity: a permanent increase in morbidity rates (i.e. morbidity over normal prevailing rates) of 25%

The impact of reinsurance recoveries being limited to 70% of the total amount reinsured for the above four stress scenarios (tests **L2, L4, L6 and L8** respectively).

Test L9: Persistency: a 25% increase in lapse rates

Test L10: Persistency: a 25% fall in lapse rates

Test L11: Expense inflation: a 2% p.a. increase in the rate of future expense inflation with no corresponding increase in the assumed rate of future investment return

General (non-life) Risks

Test G1: Catastrophe: the largest feasible natural or man-made catastrophe probable maximum loss, based on the most severe peril, e.g. flood, windstorm or earthquake

Test G2: Catastrophe and reinsurer default: as test G1 but reinsurance recoveries limited to 70% of the total amount reinsured

Test G3: Claims inflation: a 2% p.a. increase in claims inflation