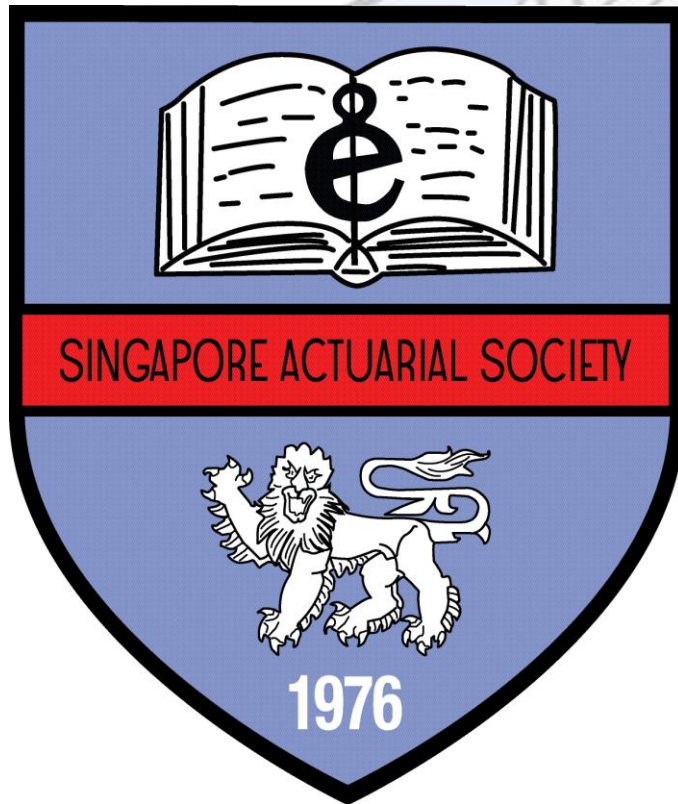


Singapore Actuarial Society General Insurance Conference

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SAS Working Party Stress Test



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1. Objective of Stress Test

- A test of “what if” scenarios
- Understand the movements in capital position
- Provide a relevant additional tool for the Board, senior management as well as MAS supervisors
- May evolve as MAS undertakes a review of the RBC framework.

1. Objective of Stress Test

What the stress test exercise is not about:

- Assume absolute worst-case scenarios aiming to cover extreme tail risk .
- Force-ranking of insurers.

2. Stress Test Survey Results

- The workgroup disseminated a survey for all the Singapore Certifying Actuaries.
 - We received feedback from 50% of the CAs.
- The objective of the survey was to obtain actuaries' opinion on the General Insurance Stress Test Exercise conducted by MAS.
- 9 questions were asked

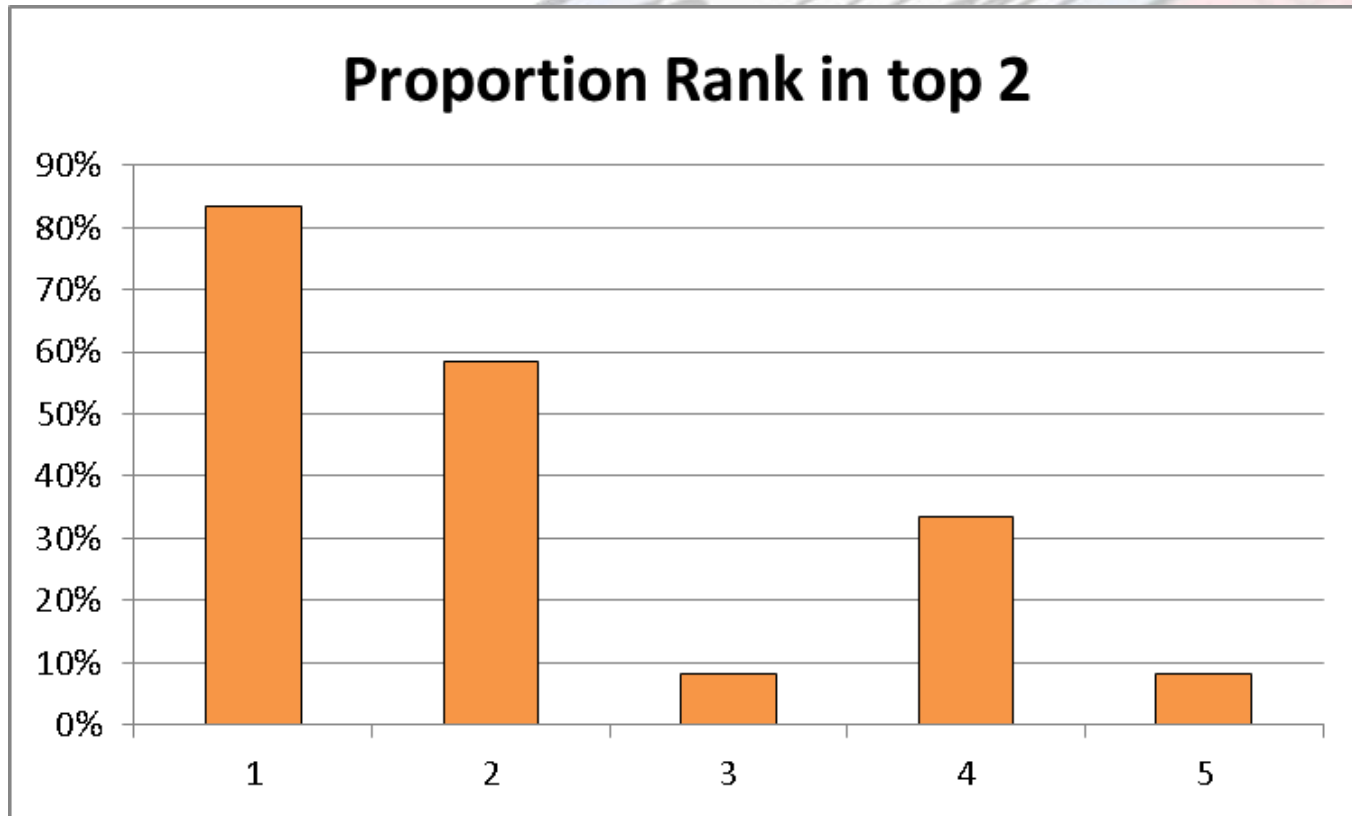
2. Stress Test Survey Results – Q1

Question 1: What do you think should be the key objectives of the stress test exercise?

Multiple Choice

1. To increase insurer's risk awareness
 2. Better understanding for economic capital modelling
 3. Quantify impact of Loss Scenarios
 4. Develop mitigating actions or response strategies
 5. Satisfy Supervisory Authorities requirements
- 12 out of 13 respondents answered

2. Stress Test Survey Results – Q1



2. Stress Test Survey Results – Q1

- The 2 key objectives noted from the responses:
 - A1: To enable the insurer to identify and assess risks undertaken thereby increasing insurer's risk awareness (83% of respondents rated this in the top 2)
 - A2: To enable the insurer to understand movements in capital position in stress situations which would assist in economic capital modelling thereby ensuring sufficient capital (58% of respondents rated this in the top 2)

2. Stress Test Survey Results – Q2

Question 2: What are the top 3 key challenges faced when conducting the stress test exercise?

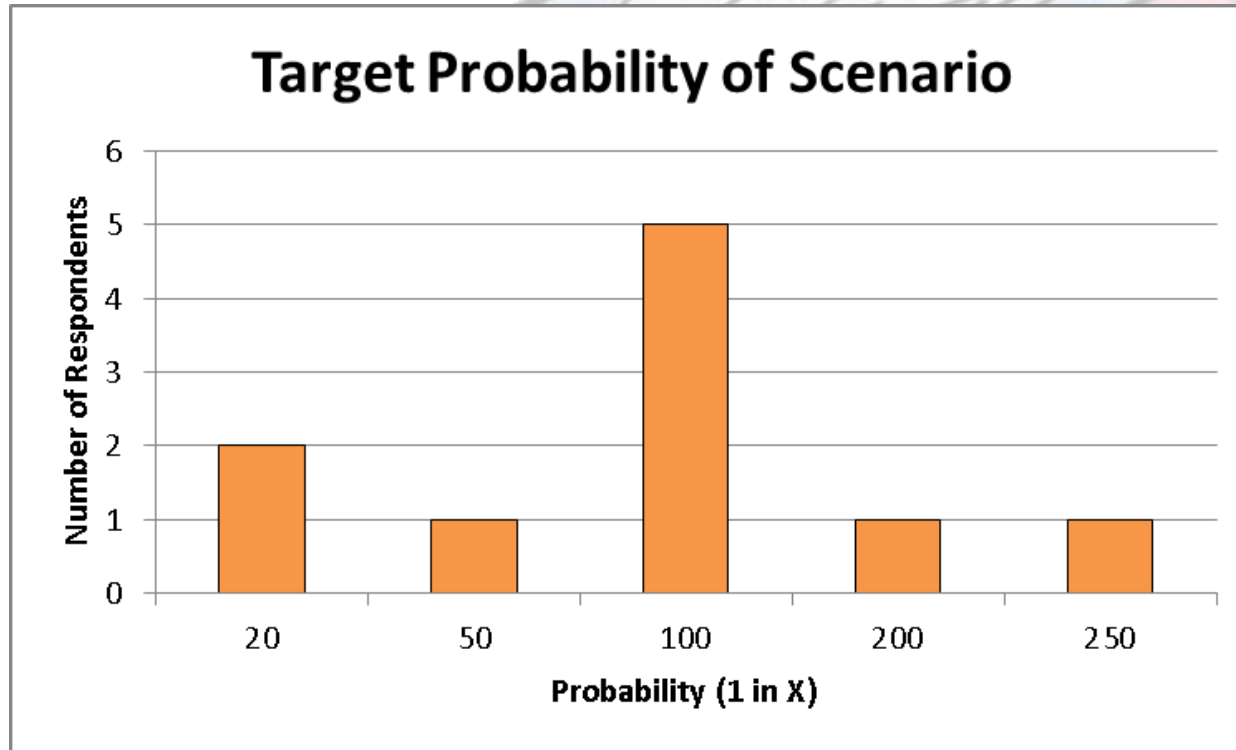
- Most common challenge noted was the construction of stress scenarios. Respondents cited difficulty in identifying possible concentrations to natural peril, assessing non-quantitative risks and deciding the severity of the scenario
- Other challenges cited were
 - limited data
 - identifying meaningful management actions
 - communicating with the management of the insurer
 - ensuring the scenario is relevant

2. Stress Test Survey Results – Q3

Question 3: How severe should the large loss scenarios be?

- 12 out of 13 respondents answered
 - One answered 'Unquantifiable' another 'Internal Selection with Explanation'
- While acknowledging that can't derive an exact probability, each Actuary should be working towards an 'intended probability'
 - That is, how likely do they think the severity should be?
- Given this is not a Stress Test to '*Failure to Pay Claim*' rather a Stress to a '*Statutory Insolvency*' does this imply a different level of sufficiency is appropriate

2. Stress Test Survey Results – Q3



- Responses suggest a wide range of interpretation

2. Stress Test Survey Results – Q4

Question 4: How is the stress to failure determined?

- 12 out of 13 respondents answered.
- Most felt that the stress to failure was a combination of the large loss scenario with other scenarios
- Others used a more severe version of the large loss scenario
- Others 'Reverse Engineered' a scenario from multiple causes resulting in failure

2. Stress Test Survey Results – Q5

Question 5: What are the key challenges in communicating and using the stress test results and recommendations to the different stakeholders, including the Board of Directors?

- 12 out of 13 respondents answered.
- Most felt that there was difficulty in communicating to the senior management and Board the relevance of the stress test assumptions and results.
 - Some cited that the senior management and Board felt that the scenarios were remote and unlikely to happen or the Board would dismiss risks that they were 'used to'
 - Ensuring interest in a 'Compliance Exercise'

2. Stress Test Survey Results – Q6

Question 6: What are the key areas of the stress test which you would appreciate guidance or guidelines on?

- 54% of respondents felt that there were no areas which they required guidance on.
- Those that did request guidance suggested:
 - construction of stress scenarios
 - Suggestions for modelling approaches
 - Operational risks
 - Target probabilities for scenarios

2. Stress Test Survey Results – Q7

Question 7: Would the stress test exercise be more useful to the insurer if there were more prescribed or self-constructed scenario?

- 11 out of 13 respondents answered.
- 82% of respondents felt self-constructed scenarios were more useful as they would help to identify major risks and involve management in the discussion of the scenarios
- 18% of respondents felt prescribed scenarios were more useful as they allowed for better comparability across the industry

2. Stress Test Survey Results – Q8

Question 8: How can the stress test exercise be improved such that it would be more useful/relevant for the Board/Head Office and Senior Management?

- 11 out of 13 respondents answered.
- Most felt that there could be more clarity or guidance provided to management on the objectives and purpose of the exercise and how it can be linked to the Board's risk management principles and objectives.
- Others felt that the stress test exercise should consider stress scenarios over longer terms, probability of occurrence of stress scenarios and linked with enterprise risk management.
- Timing – Doing in February and March means management focus is with Auditors

2. Stress Test Survey Results – Q9

Question 9: What other improvements do you think can be made to the existing stress test exercise?

- 9 out of 13 respondents answered.
- Responses were varied.
 - reduced volume of forms to be filled out
 - submission of the base and prescribed scenarios to be brought forward with more time given for the self-constructed scenarios
 - conducted before year end so it can form an integral part of business planning exercise
 - clearer instructions
 - encourage companies to move towards setting up an internal capital model.

3. International Stress Test Comparison

	Objective	Prescribed or self-constructed	Scope of scenario	Probability
Singapore	<u>To test CAR</u>	<u>Both</u>	<u>Whole of operation</u>	<u>Not specified</u>
Malaysia	To test CAR	Self-constructed	Whole of operation	Not specified
Korea	To test solvency	Prescribed	Whole of operation	Not specified
China	To test solvency	Both	Whole of operation	Not specified
Japan	To test solvency	Both	Asset, earthquake, typhoon	Typhoon: 1 in 70
Bermuda	To test solvency	Both	Whole of operation	Not specified
S2	To test solvency	Prescribed	Assets, Cat, loss inflation + sovereign rating	Cat: 1 in 200
Lloyd's RDS	Manage cat risk	Both	WS (US, Europe , Japan), EQ (US , Japan), UK flood , US terrorism , marine, energy, aviation, space, professional liab, political risk	Not specified

3. International Stress Test Comparison

	Objective	Prescribed or self-constructed	Scope of scenario	Probability
Switzerland	Reflect probability of extreme events	Both	Whole of operation	1% TVar
UK ICA	The insurer can either use a stress / scenario or stochastic modeling approach	Self-constructed	Whole of operation	1 in 200
Australia	Embedded in the Minimum Capital Requirement	Cf. MER	Whole of operation	1 in 200 from 2013

3. International Stress Test Comparison

- Impact of successive financial crises (Korea, Bermuda, S2)
- Indirect versus direct impact on capital (Australia, Japan, ICA, Switzerland)
- Types of stress test
 - Scenario
 - Sensitivity (Malaysia, Korea)
 - Reverse stress testing (Korea)

3. International Stress Test Comparison

- **Timeframe:**
 - 1 year (Australia, ICA, S2, Switzerland)
 - >1 year (Singapore, China, Korea, Malaysia)
- **Actuaries (Singapore, Japan)**
- **Changes in Australia:**
 - Life and General Insurance Capital (LAGIC)
 - 1 Jan 2013

4. Conclusions for Singapore

- Stress testing becoming global best practice and Singapore is leading the way in Asia
- At present limited linkage between Stress Test and actual capital requirement
 - May evolve as MAS review RBC
 - Nonetheless expected to be embedded within insurers' risk/capital management plan
- Whilst Singapore is generally safe from natural cats, many OIF portfolios are exposed to natural perils throughout SEA
- Senior management and Board involvement essential for Stress Test to add value rather than 'compliance exercise'
- 2012 will be challenging with earlier timetable. Plan early!