Review of the Risk-Based Capital Framework for Insurers in Singapore ("RBC 2 Review")

Response to the

Monetary Authority of Singapore

Consultation Paper P011-2012 (June 2012)

By

Singapore Actuarial Society

29 August 2012

SINGAPORE ACTUARIAL SOCIETY
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29 August 2012

Ms. Luz Foo
Head, Insurance Department
Monetary Authority of Singapore
10 Shenton Way
MAS Building
Singapore 079117

Dear Ms. Foo,

Re: Consultation Paper P011-2012
Review of the Risk-Based Capital Framework for Insurers in Singapore ("RBC 2 Review")

The Singapore Actuarial Society ("the Society") is pleased to present the response to the Proposals and Consultation Questions put forward in the above Consultation Paper on the RBC 2 Review undertaken by MAS. The Society strives to promote actuarial best practices in the insurance industry and the responses represent the views of members who will be heavily involved in implementing changes to the RBC framework for insurers.

This document is the culmination of efforts put in by the Life Insurance, General Insurance and Enterprise Risk Management Committees to draft the preliminary response. This document was subsequently circulated to the general membership. Members contributed their views on the draft response, via e-mail followed by an open forum held on 17 August 2012, which was attended by more than 100 members.

Our final responses took into account all the views expressed. While these responses represent the majority view of members of the Society, they may not represent the views of every individual member. They also represent the views of the profession and not those of the employers of, or other parties receiving advice from, our members.

The Society will be publishing the response on the Society website and it will be available to the public.

We are looking forward to meeting with you and your team on 4 September to discuss the Society's responses. If you or they have any questions or wish to speak to me, I may be contacted at **President@actuaries.org.sg** or **Jhoffman@MunichRe.com** or at +65 6318 0764.

Yours sincerely,

Jill Hoffman, FSA, FCIA, FSAS
President 2012/2013
Singapore Actuarial Society

Raymond Cheung, AIA, ASAS
Chair, RBC 2 Taskforce & Hon. Secretary 2012/2013
Singapore Actuarial Society

About the Singapore Actuarial Society

The Singapore Actuarial Society was formed in 1976. At that time, the profession was little known in Singapore and there were only a handful of qualified actuaries. The adoption of the new Constitution in July 1996 and the Code of Professional Conduct in November 1997 is the fruition of efforts made in the past two decades to promote the study of actuarial science and professional standards.

The Society is the recognised representative body of the actuarial profession in Singapore, having the final authority in setting professional standards. The objectives of the Society are:

- to uphold the highest professional standards among members;
- to serve the public's interest in matters we are uniquely qualified to respond on;
- to promote the study, discussion, publication and research into the application of economic, financial and statistical principles to practical problems, the actuarial, economic and allied aspects of life assurance, non-life insurance, employee retirement benefits, finance and investment with particular reference to Singapore and the ASEAN region;
- to assist students in the course of their actuarial studies;
- to further the professional development of actuaries; and
- to foster and encourage social relationship among the members.

Our office is located at 81 Clemenceau Avenue, #04-15/16 UE Square, Singapore, 239917. Please visit our website www.actuaries.org.sg for more information.

Consultation Response
Review of the Risk-Based Capital Framework for Insurers in Singapore (RBC 2 Review)

Table of Contents

Section 1 – Background and Scope

1.1 The Monetary Authority of Singapore ("MAS") issued a Consultation Paper on 22 June 2012 entitled Review on the Risk-Based Capital Framework for Insurers in Singapore ("RBC 2 Review" or "the Consultation Paper").

1.2 An RBC 2 Special Taskforce ("the Taskforce") was set up at the request of the Council of the Singapore Actuarial Society ("the Society") to present comments and recommendations to MAS on the RBC 2 Review Consultation Paper.

1.3 The recommendations for responses to the Consultation Paper proposed by the Taskforce were presented to the Society's membership at large for comment and posted on the Society's website.

1.4 The final responses from the Society, taking into account members' comments on the recommendations of the Taskforce, were reviewed and approved by the Council of the Society.

1.5 The comments and recommendations in the Society's responses are:

- based on actuarially sound principles and not on subjective bases or opinions;
- the independent views of the Society based on feedback from those individual members of the Society who responded to the RBC 2 Review, and do not represent the views of any company, firm or any other association with which any of our members may be engaged in or with;
- consistent and coherent views across different core practices (e.g., life insurance, general insurance and enterprise risk management ("ERM")); and
- solely directed to the RBC 2 Review and may not necessarily be applicable to any other solvency regime in jurisdictions outside Singapore.

1.6 This document incorporates the responses from the members of the Society and consists of an Executive Summary in Section 2, which is followed by more in-depth comments and recommendations on the individual Proposals and Consultation Questions, raised in the Consultation Paper, in Section 3 of this report.

1.7 The terms of reference for the Taskforce can be found in Appendix 1 and the list of taskforce members and contributors can be found in Appendix 2.

Section 2 – Executive Summary

2.1 In general, the Society is supportive of the objectives of the MAS as contained in the RBC 2 Review. However, the Society would like to highlight several issues and concerns.

Proposal 3

2.2 The Society agrees with Proposal 3 to have an explicit risk charge to capture operational risk within the RBC 2 framework. If MAS wishes to implement a simple formula until internal models are allowed and used, the formula should not negatively impact an insurer's risk management behaviour or place too great a burden on them. The proposed formula does not influence risk management behaviour.

Proposal 4

2.3 The Society agrees with Proposal 4:

- For general insurers, the Society agrees that more research around catastrophe risk should be carried out, and will welcome the opportunity to assist MAS to design appropriate catastrophe scenarios.
- For life insurers, the Society agrees that a pandemic scenario is the most likely form of catastrophe that could affect life insurance business and a charge for this risk may be warranted. However, care must be taken to ensure that the calibration of this charge takes into account the calibration of the charges for other mortality and morbidity risks, which may allow for trends and for level mis-estimation, to avoid double-counting of risks.

Proposal 5

2.4 The Society agrees with Proposal 5 to recalibrate risk requirements using the Value at Risk ("VaR") measure over a one-year period. We would also like to see a discussion on the appropriateness of adopting the 99.5% confidence level for the Singapore insurance industry. The timeline to finalise the calibration factors / shock scenarios by 1Q 2013 is a concern. A longer timeframe should be given for the calibration of the above requirements.

Proposal 6

2.5 The Society does not agree with Proposal 6 to disallow diversification benefits. Not allowing for diversification benefits will lead to an undue increase in regulatory capital requirements over the current requirements. This will create a much higher capital standard than the 1-in-200 year basis, which is inconsistent with the objectives of **Proposal 5**. The Society is happy to discuss any actuarial research work around diversification benefits if so requested by MAS.

Proposal 7

2.6 The Society welcomes the proposal to allow the use of partial or internal models in the next phase of the RBC 2 Review. However, there are a number of issues that have been highlighted for the consideration of MAS.

Proposal 9

2.7 Two views were expressed on how negative reserves could be treated. One option is for the full total negative reserve to be reflected in the best estimate liabilities, and for a reduced value to be reflected in the policy liabilities including the provision for adverse deviations ("PAD"), and to consequently appear on balance sheet. The alternative option is to allow the negative reserve arising when the policy liabilities, including the PAD, is calculated as a positive financial resource adjustment ("FRA").

Proposal 10

2.8 For Proposal 10, the Society requests clarification of the definition of FRA under the Insurance (Valuation and Capital) Regulations 2004 if the intent is not to treat the Allowances for Provision for Non-Guaranteed Benefits ("APNGB") as Tier 1 Capital.

Proposals 11 and 12

2.9 The Society proposes that the Prescribed Capital Requirement ("PCR") should be maintained at company level only, while the Minimum Capital Requirement ("MCR") should be maintained at insurance fund level only. The Society's counter-proposal to Proposals 11 and 12 seeks to strike a balance in terms of not being overly excessive but still ensuring that a company is adequately capitalised and maintaining a minimum standard of capital adequacy at insurance fund level.

Proposal 13

2.10 Removal of the Long Term Risk Free Discount Rate ("LTRFDR") is more market consistent. However, the Society sees value in retaining the LTRFDR whilst retaining the flexibility under MAS 319 to allow an insurer that has implemented an effective cash flow hedge or fair value hedge to elect to use the market yield of the Singapore Government Securities ("SGS") of a matching duration as the discounting rate.

Consultation Question 6

2.11 The Society proposes that the Cost-of-Capital ("COC") approach in determining the PAD not be adopted until such time the accounting profession has clearly defined the standards for calculating insurance liabilities, and the PAD should be calculated as provided for in the current Insurance (Valuation and Capital) Regulations 2004.

Proposal 17

2.12 The timeline for the implementation of the RBC 2 requirements would depend on the timeline for the calibration of these requirements for which the Society has expressed concern.

Important Consideration

Comparison with Banking Capital Frameworks

2.13 The Consultation Paper references Basel III and other banking regulations. During the International Association of Insurance Supervisors ("IAIS") Conference held in Seoul in September 2011, discussions regarding systemic risk for insurance sector generally concluded that the insurance sector is less susceptible to systemic / contagion risks than the banking industry.

Comparison between Life and General Insurance Markets

2.14 The nature of life insurance business is different from that of general insurance business. The investment portfolios of life insurers and of general insurers are also different. In our view, adopting one formula approach to derive risk charges with similar or identical factors and assumptions applicable to both life and general insurers is fundamentally inappropriate.

Most Important Concerns

2.15 A number of the Proposals in the Consultation Paper, in their current forms, will lead to an undue increase in regulatory capital over the current requirements. The increase cost of capital will eventually be passed on to consumers through more costly premiums or lower coverage.

2.16 The short timeline proposed for calibration exercise and implementation of the new requirements is rather ambitious. For example, the European Union Solvency II Directive ("Solvency II") took more than 5 years for calibration exercises, from the Quantitative Impact Studies ("QIS") 1 to QIS 5.

Section 3 – Responses on Individual Proposals & Consultation Questions

Proposal 1

MAS proposes to incorporate an explicit risk charge to capture spread risk within the RBC2 framework.

3.1.1 A credit spread widening could be due to the perceived increase in default risk of the bond issuer and the investor demanding a higher yield. Therefore, one measure of spread risk is the credit quality of bond issuers and there may be an overlap with the current debt specific risk charge, which takes into account this credit quality.

3.1.2 More clarity should be provided as to how this new risk factor will be co-ordinated with the current debt specific risk charge to minimise the potential for double counting.

Proposal 2

MAS proposes not to impose an explicit risk charge for liquidity risk. MAS will work with the industry to conduct liquidity stress-testing, and assess the soundness of the insurer's liquidity risk management practices as part of MAS' risk-based supervision.

3.2.1 The Society agrees with the proposal that a liquidity stress testing exercise should be part of the risk assessment of the insurer.

Proposal 3

MAS proposes to incorporate an explicit risk charge to capture operational risk within the RBC 2 framework, calculated as:

x% of the higher of the past 3 years' averages of (a) earned premium income; and (b) gross policy liabilities, subject to a maximum of 10% of the total risk requirement.

Where x = 4% (except for investment-linked business, where x = 0.25% given that most of the management of investment-linked fund is outsourced)

Consultation Question 1
Is this formula or bases chosen appropriate? Should we be using written premium or net policy liabilities instead? Should there be differences in the formula for different types of insurers, for example, direct life, direct general and reinsurers?

Consultation Question 2
What type of data can the insurance industry start to collect in order to build up sufficient data to better quantify or model operational risks?

Consultation Question 1

3.3.1 The Society suggests that, while any standard formula will not lead to better risk management practices by companies, it is appropriate to recognise that a portion of the capital required by an insurance or reinsurance company relates to operational risk. As a result, while operational risk should be managed through qualitative assessment under the ERM (including Own Risk and Solvency Assessment ("ORSA")) framework, until the introduction of internal models, an allowance for operational risk through a relatively simple approach is reasonable.

3.3.2 However, it should be noted that, as internal models may not be introduced for some time and ultimately may not become mandatory, this operational risk formula will continue to be used indefinitely. As a result, care should be taken to ensure the formula selected does not negatively impact the risk management behaviour of insurers or place too great a burden on them which simply leads to additional costs to be borne by the policyholders.

Why the Proposed Formula may be Inappropriate

3.3.3 Besides requiring an insurer to hold assets adequate to mitigate losses due to exposure to a particular risk, a risk charge should also be designed to encourage insurers to adopt good risk management practices. The formula proposed, which is based on volume of business, fails to achieve this design consideration. It does not influence risk management behaviour in any way, and appears to punish commercial success. It should not be assumed that when an insurer grows its business, it will be at the expense of risk control, unless the growth is unusually rapid as measured by a specified threshold for the year-on-year growth rate.

3.3.4 For example, if Insurer A and Insurer B both have similar premium sizes and policy liabilities, they would have similar risk charges for operational risk according to the proposed formula. This is despite Insurer A having excellent operational risk controls with a dedicated risk management team and Insurer B with no resources allocated to risk management. This does not provide any incentive for Insurer B to improve its operational risk management control in the future.

3.3.5 In addition, the formula does not capture different insurers' diverse lines of business that will entail different levels of operational risk. For example:

- For life insurers, term products are more straightforward and hence should have lower operational risk exposure.
- For general insurers, operational risk exposure for consumer lines products is different from commercial lines products due to the nature of the products.

3.3.6 The portion of operational risk that may already be captured under other risk charges, such as the expense risk charge, should be considered, so as to ensure there is no double counting.

Comments

Net Liabilities is Better

3.3.7 Liabilities net of reinsurance may be deemed notionally to be the accumulation of premiums received, less expenses and premiums ceded to reinsurers to accept transfer of liability risks. The retained premiums include loadings for mitigation of all risks not transferred, which include operational risk. As such, the operational risk charge is more closely related to the net liabilities than to the gross liabilities. In addition, the reinsurer will be holding operational risk capital for the risks ceded, so there is a potential of double counting.

3.3.8 For general insurers, the gross liabilities may be highly volatile and un-correlated to operational risk. As such, an operational risk charge related to gross liabilities may be unstable.

Written Premium is Better than Earned Premium

3.3.9 Written premium is generally considered a more appropriate basis than earned premium as operational risk is usually related to the process of writing the business rather than the accounting process of earning it.

3-Year Averages May Be Inappropriate

3.3.10 Using a 3-year average may delay the recognition of the operational risk exposure of an insurer experiencing rapid premium growth, with the increased likelihood of occurrence of operational losses. While the use of averages helps to reduce the impact of random fluctuations from year to year, it can also mask trends in the underlying data.

3.3.11 For this reason, the Australian Prudential Regulation Authority ("APRA") inserted a component which added to the risk charge for insurers which had seen growth in a year greater than some threshold.

The Common Factor of 4% is Inappropriate

3.3.12 Direct insurers and reinsurers have varying degrees of operational risk exposure and the one size fits all approach (4% of x) is not appropriate. Some insurers have material differences between earned premiums and policy liabilities, and using the same factor (4%) for both components may result in highly divergent measurements. This is particularly true for larger life insurers with larger policy liabilities and these insurers will most likely hit the cap (10% of total risk requirement ("TRR")). Hence, different factors should be used to reflect the varying degree of operational risk exposure, for example, between:

- Earned premiums and policy liabilities;
- General insurers and life insurers; and
- Direct insurers and reinsurers.

Other Risk Factors

3.3.13 Operational risk is not just about liabilities. The proposed formula does not consider the amount of investment assets an insurer holds. For life insurers, operational risk in investment management may not be fully captured if the impact on investment assets is not considered.

Recommendations

3.3.14 The Society recommends to modify the proposed formula such as to:

- Change the bases of the formula to net liabilities (rather than gross liabilities) and written premium (rather than earned premium).
- Remove the 3-year average requirement, and instead apply a factor (or factors) based on the rate of growth in business in the current year over the business in the prior year, where the factor is different if the rate of change is below or above a specified threshold.
- Consider adding a component based on a factor related to volume of investment assets, but adjusting the other factors to ensure that the risk charge does not become onerous.

- Apply different factors ("x") to different base components (liabilities, premium and investment assets), to different lines of business, and to different types of insurers.

Alternative Approaches

3.3.15 The Society will be happy to discuss with MAS on any actuarial research work around operational risk. For example, the Society could perform further research and propose alternative tools and methodologies to capture operational risk.

3.3.16 The proposed formula simply provides recognition that operational risk requires capital as a risk mitigation measure. An alternative approach is to simply measure the operational risk charge as a percentage of the overall TRR, similar to the cap proposed in the Consultation Paper. As operational risk cuts across all areas of the company's operations, this would allow the calibration of the other risk factors to be calculated independently of any operational risk considerations. This approach assumes that operational risk is proportional to all the other risks faced by an insurer and may not be an unreasonable first approximation until more sophisticated internal models can be developed. However, the factor should be calibrated such that the risk charge does not prove to be onerous. The factor(s) should be selected such that the TRR for all risks is calibrated to VaR at an appropriate confidence level. Prima facie, it is unclear whether 10% will be onerous or not.

General Comments

3.3.17 Paragraph 2.9 in the Consultation Paper states that "there is no evidence to suggest that an insurer's operational risk would be vastly different from that experienced by a bank." The Society's view is that historical events have shown that the frequency and magnitude of operational risks experienced by the insurance sector is significantly lower than the banking sector. The Association of British Insurers ("ABI") published a research paper in 2009 entitled "*Analysing Operational Losses in Insurance*"[1]. It was stated in the paper that the insurance industry's operations '*involve fewer transactions and less trading, which are important drivers of operational failures.*' There are also other research papers[2] supporting the view.

Consultation Question 2

What type of data can the insurance industry start to collect in order to build up sufficient data to better quantify or model operational risks?

3.3.18 Insurers can start collecting some key risk indicators ("KRIs") data that can measure or highlight the operational risk profile of an insurance company: staff turnover, growth trends, number of policies, etc.

3.3.19 Insurers can also collect data on operational loss events. Both actual losses and "near misses" may be captured in the databases. Periodic industry surveys can be undertaken to

[1] http://www.abioric.com/home/abi-oric-research-paper.aspx

[2] a) Risk Management Banks versus Insurers – PowerPoint slides (https://web.actuaries.ie/sites/default/files/event/2011/07/111109%20Risk%20Mgmt%20-%20Banks%20vs%20Insurers.pdf)
b) Why the current practice of operational risk management in insurance is fundamentally flawed - evidence from the field (http://www.ermsymposium.org/2012/OtherPapers/Acharyya-Paper-01-16-12.pdf)
c) Special Report on Systemic Risk in Insurance – Geneva Association, March 2010 (http://www.genevaassociation.org/portals/0/Geneva_Association_Systemic_risk_in_Insurance_Report_March2010.pdf)

produce industry benchmarks. However, the reliability and consistency of data received can be a challenge.

3.3.20 We can draw reference from other capital and solvency regimes, such as Solvency II Directive in Europe, to understand the type of data being collected to quantify operational risks for the insurance industry.

Proposal 4

MAS proposes to incorporate an explicit insurance catastrophe risk charge in the RBC 2 framework. This would be done through prescribing a number of man-made and natural catastrophe scenarios, with an explicit risk charge computed accordingly from a combination of these scenarios. MAS intends to work with the industry associations, reinsurance brokers and the other risk institutes/academia in Singapore to design relevant standardized catastrophic scenarios. For life business, the explicit insurance catastrophic risk charge can be derived based on a pandemic event.

3.4.1 General insurers and life insurers have varying degrees of catastrophe risk exposure and the approaches to incorporate the risk charge may also vary between the two sectors.

General Insurance

3.4.2 For reinsurers and general insurers that write substantial offshore business, insurance catastrophe risk is a fundamental component to quantify aggregation risk exposure. For other direct local general insurers, while catastrophe risk may not be that significant as Singapore has relatively low exposure to natural catastrophe events, accumulation risk still needs to be considered.

3.4.3 The concept of an explicit catastrophe risk charge using scenario testing is sound in principle.

3.4.4 The Society believes more research around catastrophe risk should be carried out, and will welcome the opportunity to assist MAS to design appropriate catastrophe scenarios.

3.4.5 If an explicit risk charge for catastrophe risk is adopted, care must be taken to avoid the overlap with the liability risk charges, and to consider the low correlation between natural catastrophes and other risk events such as economic recessions. In addition, changes need to be made to the current stress testing framework to avoid duplicating stress scenarios and consequently double counting the capital requirement.

Life Insurance

3.4.6 As the consultation paper intimates, a pandemic scenario is the most likely form of catastrophe that could affect life insurance business and a capital charge might be warranted. The impact of a pandemic may be greater on morbidity risks than on mortality risks, and so medical and disability insurance may need to be included as part of the calibration process. Care must be taken to ensure that the calibration of this charge takes into account the calibration of the risk charges for other mortality and morbidity risks, which may allow for trends and for level mis-estimation, to avoid double-counting of risks (e.g., if the mortality rates adopted allow for the experience during historical pandemics).

3.4.7 The suggested level of 1.5 per mille of sum at risk for mortality risk will be something to address during the calibration exercise. There are potentially many positive factors in Singapore's favour that may reduce the risk of spread of pandemic.

Proposal 5

MAS proposes to recalibrate risk requirements using the Value at Risk ("VaR") measure of 99.5% confidence level over a one year period.

MAS will be engaging the industry on the calibration exercise, and target to finalise the calibration factors/shock scenarios by 1Q 2013. Data would need to be collected for this purpose. The recommended calibration factors or scenarios will be consulted prior to its finalisation.

Appropriateness of 99.5% Confidence Level

3.5.1 The VaR 99.5% confidence level has been widely adopted as a solvency standard in other regulatory regimes. However, we have observed that the Singapore insurance market has survived through a number of global and Asian economic crises in the last few years without major problem means that the current Risk-Based Capital regime is operating at a satisfactory level. The Society, therefore, would like to see a discussion on the appropriateness of a confidence level of 99.5% for the Singapore insurance industry.

3.5.2 When calibrating risk charges, say for long-term mortality and morbidity risks, the Society recommends using a rolling number of years of actual / expected results to allow for random fluctuations, especially for smaller industry risk portfolios, e.g., long-term disability portfolios.

Use of VaR or TVaR

3.5.3 The Society agrees with the proposal to recalibrate risk requirements using the VaR measure over a one year period, mainly because VaR is easy to compute, has been widely accepted and is used by regulatory regimes in other countries.

3.5.4 However, it will be useful to understand the purpose of the risk measure proposed from the perspective of MAS. For example, If MAS is concerned only about when default events occur, then VaR is appropriate. If MAS is also concerned about how much the likely associated shortfall is when a default event occurs, then TVaR is more appropriate.

3.5.5 The Society would also like to highlight that no risk measure is perfect and there is the need to appreciate the limitation of VaR to minimise mis-interpretation of results based on VaR. For example,

- VaR is not a coherent measure and has poor aggregation properties. It is not suitable for non-symmetrical loss distributions (e.g., of insurance catastrophe risks). VaR is also not a good risk measure at the tail for extreme events, as it tends to underestimate the loss potential. For example, VaR as a risk measure has been heavily criticised for failing to warn of the possible losses in the 2008 credit crunch. VaR also ignores information beyond the calibration point; but
- TVaR, on the other hand, has the advantage of coherence, of being sub-additive which encourages diversification, and offers more information around the tail compared to VaR.

3.5.6 The Society seeks clarification as to whether the liabilities of the insurance company which the VaR is based on include a PAD.

Timeline

3.5.7 Timeline to finalise the calibration factors / shock scenarios by 1Q 2013 is a concern especially when the stress test deadline has been brought forward to the end of the first

quarter next year (31 March 2013). A longer timeframe may have to be allowed for the calibration of the risk requirements. For example, Solvency II took more than five years for their calibration exercises, from the QIS 1 to QIS 5.

Proposal 6

MAS proposes not to allow for diversification benefits when aggregating the capital risk requirements. MAS is, however, prepared to consider diversification benefits if the industry is able to substantiate, with robust studies and research conducted on the local insurance industry, that there are applicable correlations which can be relied on during normal and stressed times.

3.6.1 The Society proposes that diversification benefits should be allowed for when aggregating the capital risk requirements, both within and between risk categories.

Why Diversification Benefits are Relevant

3.6.2 Not allowing for any diversification benefit implies that all risks are perfectly correlated in the tails, and will lead to an undue increase in regulatory capital requirements over current requirements. This will create a much higher capital standard than the 1-in-200 year basis which is inconsistent with the objectives of **Proposal 5**. These increased costs will eventually be passed on to the consumers through more costly premiums or lower coverage. Under Solvency II, the impact of diversification benefits measured in the QIS 5 was more than 35% reduction in the capital required[3].

3.6.3 The Society is happy to discuss any actuarial research work around diversification benefits if so requested by MAS, similar to the research conducted by the Institute of Actuaries of Australia[4] in 2001.

Proposal 7

MAS proposes to allow the use of partial or internal model in the next phase of the RBC 2 review, after the implementation of the standardised approach. The internal model, which will be subject to approval by MAS, will have to be calibrated at the same level as the standardised approach.

3.7.1 The Society agrees with the proposal to allow the use of partial or internal models in the future but would like to provide some points for consideration by MAS in drawing up the internal model regulatory and supervisory framework.

[3] https://eiopa.europa.eu/fileadmin/tx_dam/files/publications/reports/QIS5_Report_Final.pdf Graph 10

[4] Bateup-Reed (2001 study) and Collins-White (2001 study)

Points for Consideration

3.7.3 The Consultation Paper is silent on how implementing internal models will affect the capital requirement of insurers. If there is no direct benefit from a regulatory capital perspective, it is unlikely that insurers will invest money and resources to set up internal models simply because it is good risk management practice to do so.

3.7.4 The Society is also interested as to what extent insurers will be allowed to use their parent companies' internal models which may be re-calibrated to meet the target criteria of the standardised approach.

3.7.5 There should also be clarity as to the approval and validation process and the involvement of external reviewers.

3.7.6 Due to the complexity of designing and implementing these models, their use should not be made mandatory.

3.7.7 The Society considers that the implementation of the internal model should be made in conjunction with, or after, the implementation of the ERM (including ORSA) framework. An ORSA will guide the development of an insurer's model.

Proposal 8

MAS proposes to incorporate the same Basel III features (i.e. equity conversion or write-down on breach of regulatory capital requirements) for the Approved Tier 1 resource.

This means that instruments that qualifies as Approved Tier 1 resource must:
(a) automatically convert to ordinary share capital, as and when the insurer needs to absorb losses, and in any case, when the insurer breaches its regulatory capital requirement;
(b) be subject to write down as long as losses persist, as and when the insurer needs to absorb losses, and in any case when the insurer breaches its regulatory capital requirement.

The limits on the amount of Approved Tier 1 resource that can be recognised, as set out in the existing Insurance (Valuation and Capital) Regulations 2004, will remain unchanged.

3.8.1 The Society has no comments on this proposal.

Proposal 9

MAS proposes to allow a part of the negative reserves to be recognised as a form of positive financial resource adjustment under Financial Resources. MAS will consult further on the amount to be recognised.

3.9.1 Two views were expressed on how negative reserves could be treated.

- One option is for the full total negative reserve to be reflected in the best estimate liabilities, and for a reduced value to be reflected in the policy liabilities including the PAD, and to consequently appear on balance sheet. This approach gives credit to the economic value of business, and is more in line with a market consistent presentation of the liabilities of the insurer. However, this would lead to tax related considerations.

The capital required to mitigate the impairment of this synthetic asset will automatically be calculated by testing the surrender and lapse assumptions to the required VaR confidence level. It will not be necessary to set an arbitrary cap on the recognition of this asset.

- The alternative option is to allow negative reserve arising when the policy liabilities, including the PAD, is calculated as a positive FRA. This will have no immediate tax implications, and the positive adjustment is therefore "off balance sheet" and appears in the numerator in the calculation of capital ratio. The permitted total negative reserve is therefore not reflected in the economic value of the business in the best estimate liabilities or in the policy liabilities including the PAD.

3.9.2 With regards to the release of negative reserves, consideration should also be given to the valuation of policies only to the legal contract boundary (e.g., expiry of the term of policy). This would follow the approach in Solvency II where not all Expected Profits Included in Future Premiums ("EPIFP") are recognised.

Proposal 10

MAS proposes to classify Aggregate of Allowances for Provision for Non-Guaranteed Benefits, where applicable, as a form of positive financial resource adjustment, rather than as a capital item.

This applies to an insurer maintaining any participating fund, and subject to the condition that the unadjusted capital ratio remains below the adjusted capital ratio, where:

Adjusted capital ratio, in relation to the insurer, means the ratio of the financial resources of the insurer (excluding the financial resources of any participating fund) to the total risk requirement (calibrated at 99.5% VaR over a one-year period) of the insurer (excluding such requirement arising from any participating fund); and

Unadjusted capital ratio, in relation to the insurer, means the ratio of the financial resources of the insurer (including the financial resources of any participating fund) to the total risk requirement (calibrated at 99.5% VaR over a one-year period) of the insurer (including such requirement arising from any participating fund).

3.10.1 Referring to paragraph 2 of First Schedule of the Insurance (Valuation and Capital) Regulations 2004, any FRA will be treated as part of Tier 1 Capital. The MAS proposal is to treat the APNGB as a positive FRA but this is contradictory to the MAS position that the APNGB does not meet the qualities required of a capital instrument. MAS should clarify the definition of FRA under the Insurance (Valuation and Capital) Regulations 2004 if the intent is not to treat the APNGB as Tier 1 Capital.

Proposal 11

Prescribed Capital Requirement (PCR) is the higher supervisory intervention level at which the insurer is required to hold sufficient financial resources to meet the total risk requirements which corresponds to a VaR of 99.5% confidence level over a one-year period.

An insurer which breaches its PCR will need to submit a plan on how to restore its capital position within 3 months. If the PCR is met, MAS will not normally intervene on capital adequacy grounds. This does not preclude MAS from requiring an insurer to maintain financial resources above the PCR if there are other supervisory concerns.

As a countercyclical measure, MAS will have the flexibility and discretion to allow insurers more time to restore its capital position, for example, during periods of market stresses.

PCR needs to be maintained at both the company level, as well as at an insurance fund level.

3.11.1 The Society proposes that PCR should be maintained only at the company level, and not at the insurance fund level.

3.11.2 Given that the PCR may not be additive across funds, there is a possibility that the sum of fund level PCRs may actually exceed the company level PCR, as some natural diversification of assets and liabilities across funds (e.g., by duration of liabilities and assets) may be allowed for in determining the company level PCR.

3.11.3 As capital and assets are fungible among funds (with the exception of the participating fund), it is only necessary for the insurer to be solvent, i.e. to meet the PCR, at the company level. Having to maintain PCR at fund level may lead to over-capitalisation of insurers and unnecessarily higher cost of insurance for consumers.

3.11.4 The Society's proposal seeks to strike a balance in terms of not being overly excessive but still ensuring that the company is adequately capitalised and maintaining a minimum standard of capital adequacy at insurance fund level (see below).

Proposal 12

MCR is the lower supervisory intervention level at which the insurer is required to hold sufficient financial resources to meet the total risk requirements which corresponds to a VaR of 90% confidence level over a one-year period.

If an insurer breaches its MCR, MAS may choose to invoke the strongest supervisory action (such as stopping new business, withdrawal of licence etc.).

MCR will be calibrated as a fixed percentage of the PCR. This percentage will be determined after quantitative impact studies are done.

MCR needs to be maintained at both the company level, as well as at an insurance fund level.

3.12.1 The Society proposes that the MCR should be maintained at insurance fund level only.

3.12.2 As with response 3.5.1 to **Proposal 5**, the Society would like to see a discussion on the appropriateness of adopting the 90% confidence level for Singapore.

Proposal 13

MAS proposes the following two approaches with regards to the risk-free discount rate for SGD-denominated liabilities.

(a) To keep to the same LTRFDR formula as set out in paragraph 5.5, but X and Y will now be 20 and 30 respectively. This is on the expectation that the 30-year SGS will have adequate liquidity when RBC 2 is implemented. This means:
- *Durations 0 to year 20: Use prevailing yields of SGS*
- *Durations 30 year and above: 90% of historical average yields (since inception) and 10% of latest 6-month average yield of 30-year SGS*
- *Durations 20 to year 30: Interpolated yields*

(b) To remove the LTRFDR formula altogether, i.e.
- *Durations up to 30 Years: Use prevailing yields of SGS*
- *Durations 30 year and above: Keep the yield flat at the prevailing yield of 30-year SGS*

Consultation Question 3
Which of the above approaches is more appropriate?

Consultation Question 4
Should MAS allow for some illiquidity premium adjustment in the risk-free discount rate for valuing certain portfolios such as annuity business?

3.13.1 Proposal (b) is, in theory, more market consistent. However removing LTRFDR altogether will have a significant implication on the insurance industry:

- Yields are at historical low levels and there will be a one-time large increase in the value of policy liabilities.
- There is insufficient liquidity for the recently introduced 30-year SGS and minor trades may result in big changes in the market yield that is used to value liabilities.
- Theoretically assets and liabilities are now both fully sensitive to market movement in interest rates and hence move in tandem. However the lack of liquidity of the 30-year SGS coupled with the dearth of other long duration assets means that insurers will continue to have huge duration mismatches resulting in potential high earnings volatility.
- In order to close the duration mismatch gap, insurers may be forced to compete for the limited supply of long duration assets, resulting in a further depression of yields. This will ultimately translate to an increase in the cost of insurance that will eventually be passed on to the public.

3.13.2 The Society sees value in retaining the LTRFDR and the flexibility under MAS 319 to allow an insurer that has implemented an effective cash flow hedge or fair value hedge to elect to use the market yield of SGS of a matching duration as the discounting rate.

3.13.3 The Society proposes that the discounting of liabilities on prevailing SGS yields be adopted when the supply and liquidity of long term SGS have been built up.

3.13.4 Allowing for illiquidity premium in the discount rate for long-term life insurance portfolios with cash flows which can be projected with a high degree of certainty, such as annuities, and are subject to very low or even nil lapses and surrender, is reasonable.

Proposal 14

MAS proposes that insurers follow the regulatory requirements pertaining to discounting as prescribed by the insurance supervisory authority in the jurisdiction issuing the currency, for valuing non-Singapore dollar denominated liabilities for both life and general business.

Consultation Question 5
If the relevant foreign supervisory authority has not prescribed any basis for discounting the liabilities denominated in that home currency, what should be the approach taken? Should the risk-free discount rate be the market yield of the foreign government securities of similar duration, and the yield kept flat for liabilities extending beyond the longest available government securities?

3.14.1 The discounting rate prescribed by another jurisdiction may have taken into account, holistically, the regulations applicable in that jurisdiction and other peculiarities of the jurisdiction. The Society is of the view that following the discounting rate prescribed by another jurisdiction without due consideration for other parts of the regulations in that jurisdiction is not appropriate.

Proposal 15

MAS proposes to extend the discount rate requirements for life business to general business as well, for liability durations above 1 year. For liability duration of 1 year and less, no discounting would be required.

3.15.1 The Society proposes to maintain the existing approach, i.e. allowing the actuaries to exercise their professional judgment to determine if discounting should be applied.

3.15.2 The average duration of general insurance liabilities in Singapore is significantly shorter compared to that in other countries that are more litigious (e.g., the United States), and the impact of discounting in Singapore is often immaterial.

Consultation Question 6

Do you agree that the cost-of-capital approach, for computing the provision for adverse deviation for both life and general insurance liabilities, is appropriate?

If so, do you agree that it is appropriate to adopt a cost-of-capital rate of 6% per annum? As there is no evidence to suggest that the cost of providing the amount of available capital to support the policy liabilities would be substantially different for life and general insurers, a uniform rate has been proposed for all types of insurers.

3.15.3 The advantage of the current approaches for calculating PAD is that they are relatively transparent. The approaches are not market-consistent but then again this is not a stated aim of the valuation regulations as they currently stand.

3.15.4 Adopting a COC approach to the PAD would bring an element of market consistency into the balance sheet but would not serve to greatly enhance policyholder protection, which is more driven by capital. Given the timescales for implementation of RBC 2, and other research priorities during that time, the Society would, on balance, propose to defer implementation of the proposal to Phase II of the project to give the industry time to calibrate the level of the cost of capital as well as implement the calculation methodologies into systems.

3.15.5 On the COC approach itself, we note that it has only recently, with Solvency II, garnered popularity. As mentioned in the Consultation Paper, it was studied alongside other methodologies by the International Actuarial Association ("IAA"), and was found to have properties desirable of a market-consistent approach to valuation of liabilities. However, other methodologies are also discussed in the actuarial literature from time to time and the COC approach is only one of a number of different approaches that could be judged to be market-consistent.

3.15.6 Therefore, the Society proposes that the COC approach not be adopted until such time the accounting profession has clearly defined the standards for calculating insurance liabilities, and that, until then, the PAD should be calculated as provided for in the current Insurance (Valuation and Capital) Regulations 2004.

3.15.7 Where any assumption will not be tested at VaR at an appropriate confidence level, the testing should allow for variation in this assumption from the best estimate to the best estimate plus the margin required for determining the PAD, to ensure that the value of assets derived from the testing is adequate to meet liabilities allowing for this variation.

Appropriateness of 6%

3.15.8 Research has to be conducted to determine whether the proposed rate of 6% is appropriate. Although this rate is consistent with international calibrations of the cost of capital, it may not necessarily be appropriate to insurers in Singapore.

Proposal 16

MAS proposes to introduce Enterprise Risk Management requirements, including those relating to Own Risk and Solvency Assessment, to insurers. We will consult industry on the ERM requirements and target to issue a final document by end of 2012.

3.16.1 The Society supports the introduction of ERM requirements, especially those relating to ORSA.

Taskforce's Proposed Recommendation

3.16.2 As mentioned in the response 3.7.6 to **Proposal 7** regarding internal models, the Society proposes that ORSA should be implemented in conjunction with, or before, the implementation of rules on the use of internal models.

3.16.3 In order to encourage the insurance companies to implement sound and efficient ERM frameworks, the impact of these frameworks on the calibration of the operational risk charges will need to be considered (refer to the response 3.3.1 to **Proposal 3**).

General Comments

3.16.4 The Society agrees with the statement "ERM framework should be commensurate with the nature, scale and complexity of the risks that (the insurer) bears". ERM requirements will have to be proportionate to the size of the insurer and to be adapted to the reality of small entities.

Proposal 17

MAS proposes to implement the RBC 2 requirements for the accounting year ending 31 December 2013. There will be at least 2 years of parallel run with the existing RBC framework and appropriate floors imposed to prevent sudden release in capital requirements.

3.17.1 The implementation timeline for RBC 2 requirements would depend on the timeline for the calibration of these requirements for which the Society has expressed concern (see response 3.5.7 to **Proposal 5**).

3.17.2 The proposed parallel run is not actually a parallel run if insurers are required to hold the higher of the existing capital requirements and RBC 2 requirements during the two years following the finalisation of the RBC 2 requirements. It will take time for a company to understand the implications of RBC 2 and to put in place steps to raise capital, or conduct other measures such as re-pricing, if necessary, to meet these new requirements. Therefore, both floors and ceilings should be imposed to prevent sudden releases or injections in capital requirements.

Appendix 1 – Singapore Actuarial Society RBC 2 Special Taskforce Terms of Reference

1. The Monetary Authority of Singapore ("MAS") issued a Consultation Paper on 22 June 2012 entitled Review on the Risk-Based Capital Framework for Insurers in Singapore ("RBC 2 Review").

2. The RBC 2 Special Taskforce ("the Taskforce") was set up by the Council of the Singapore Actuarial Society ("the Society") to present comments and recommendations to MAS on the RBC 2 Review Consultation Paper. The comments and recommendations submitted to MAS shall be approved by the Council of the Society.

3. The comments and recommendations provided will be:

   - based on actuarially sound principles and not on subjective bases or biased opinions;
   - independent views of the Society, not representing any individual company and/or association;
   - consistent and coherent views across different core practices (e.g., life insurance, general insurance and enterprise risk management); and
   - solely reserved for the RBC 2 Review and will not necessarily be applicable to any other regime/jurisdiction outside Singapore.

4. All valid views from the Society's perspective (with reference to point 3 above) will be included in the responses to MAS.

5. The Taskforce delegates the detailed analysis work to 3 sub-groups from the Society's practice committees (Life Insurance, General Insurance and Enterprise Risk Management).

6. The Taskforce would engage other members of the Society to contribute comments and recommendations on the RBC 2 Review through email and/or dialogue sessions.

7. The Taskforce would review the comments and recommendations from the 3 sub-groups and members of the Society.

8. The Taskforce would partner with MAS on any further studies, actuarial research or technical analysis work relating to the RBC 2 Review as appropriate.

9. The Taskforce would review and respond to circulars and requests from the MAS on any further updates on matters relating to the RBC 2 Review.

Appendix 2 – Taskforce Members

1. Raymond Cheung (Chairman and Head of ERM Committee)
2. Jill Hoffman (President)
3. Richard Holloway (Vice President)
4. Koo Chung Chang (Head of Life Insurance Committee)
5. Matthew Maguire (Head of General Insurance Committee)
6. Andrew Linfoot
7. Frederic Weber
8. Foo Lee Voon
9. Hussain Ahmad
10. Jim Qin
11. Alex Lee
12. Julien Parasie
13. Kay Shong
14. Darshan Singh
15. Lim Siang Thnia
16. Questor Ng
17. Bob Gibson
18. Chi Cheng Hock

Also, a big thank you to the following:

1. Council Members
2. Members of the Life Insurance Committee
3. Members of the General Insurance Committee
4. Members of the ERM Committee
5. Other members of the Society who have contributed in the Consultation Response

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