

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

Second Consultation



Response to the
Monetary Authority of Singapore
Consultation Paper P003-2014 (March 2014)

By

Singapore Actuarial Society

23 June 2014



SINGAPORE ACTUARIAL SOCIETY

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xx June 2014

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Dear Ms. Loo

**Re: Consultation Paper P003-2014
Review of the Risk-Based Capital Framework for Insurers in Singapore (“RBC 2 Review”) – Second
Consultation**

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 contributions by our Life Insurance, General Insurance, Health Insurance and Enterprise Risk Management Committees to draft the preliminary response. This document was subsequently circulated to our general membership. Members contributed their views on the draft response, via e-mail followed by an open forum held on 27 June 2014, which was attended by [TBC] members.

Our final response takes into account all the views expressed. While this response represents 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.

If you have any questions or wish to speak, please contact president@actuaries.org.sg or secretary@actuaries.org.sg.

Yours sincerely,

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President 2014/2015
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Raymond Cheung
Chair, RBC 2 Taskforce & Hon. Secretary 2014/2015
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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 was the fruition of efforts made in the previous 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 the setting of 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) – Second Consultation

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Section 1 – Background and Scope

- 1.1 The Monetary Authority of Singapore (“MAS”) issued the Second Consultation Paper on 26 March 2014 entitled Review on the Risk-Based Capital Framework for Insurers in Singapore – Second Consultation (“RBC 2 Review” or “the Consultation Paper”).
- 1.2 An RBC 2 Special Taskforce (“the Taskforce”) was set up¹ 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 general membership for comment and subsequently 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 rather than 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, health insurance and enterprise risk management (“ERM”)); and
 - solely directed to the RBC 2 Review and may not necessarily be applicable to other solvency regimes 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 can be found in Appendix 2.

¹ A similar Taskforce was set up in June 2012 to respond to the first RBC 2 Consultation Paper issued by MAS on 22 June 2012. The Taskforce has provided a report on the consolidated comments of the RBC 2 Review in August 2012. The report can be found in the following link: <http://actuaries.org.sg/?q=node/4361>



Section 2 – Executive Summary

[To be completed]



Section 3 – Responses on Individual Proposals & Consultation Questions

Solvency Intervention Levels

Consultation Question 1

Other than in the exceptional circumstances where MAS will allow insurers more time to restore its PCR, is the 3 months timeframe realistic? Please give concrete reasons if you think that the proposed timeframe is too short.

CQ1.1 As a longer time frame will be given in exceptional circumstances, using a 3-month restoration period appears reasonable. This aligns with the practices of other jurisdictions (for instance Solvency II regime in Europe).

CQ1.2 However, if the PCR calibration results in a significantly higher capital requirement, a longer restoration period should be adopted.

Recommendations

CQ1.3 The Society recommends MAS to consider the general options available to restore/improve the solvency position of insurers over time, and to use the 3 months as a guideline, but allow for flexibility on a case-by-case basis or depending on the degree in which the whole industry is affected, to allow companies to develop a plan to restore/improve their capital position.

CQ1.4 The Society also recommends that we will confirm the appropriateness of 3-months timeframe only after the calibration is finalised.

CQ1.5 Below, we have set out some issues that the MAS may want to consider in respect of the 3-month timeframe to restore the PCR.

Exceptional Events

CQ1.6 The Consultation Paper did not state what events or circumstances MAS would consider as exceptional events. In general, the list of "exceptional circumstance" should go beyond market stresses and to include events related to insurance risks (e.g. natural and man-made catastrophes). The Society seeks MAS' confirmation that recalibration of the risk factors constitutes an exceptional circumstance and therefore a longer restoration period would be appropriate.

Appropriateness of three months

CQ1.7 Below are some examples why 3 months may not be appropriate:

- a. Assuming that the 3 months is applicable at the entity level as opposed to fund level, while 3 months may be sufficient for some activities (e.g. a capital injection from head office) it may be too short for other resolutions (e.g. finding a buyer).
- b. Treatment for Head Offices, subsidiaries and branches is likely to differ in terms of financial flexibility:



- i. For Head Offices, capital injection by parent is not possible, so options will include equity or debt financing, or selling of existing assets. Depending on the availability and marketability of these options at the point of exceptional circumstance, they may require more than 3 months.
 - ii. For subsidiaries and branches, capital injection may be an option but the fungibility of capital still needs to be considered. 3 months may be too short for some companies.
- c. "Selling of risky assets" may require longer than 3 months.
- d. The 3-month period is dependent on the "depth" of the capital market. The Singapore market is still considered to be too shallow as compared to US and European markets.

Valuation of Assets and Liabilities

Proposal 1

MAS proposes to gradually phase out, over 5 years, the use of the LTRFDR for SGD denominated liabilities of duration 30 years or more. Over the next 5 years, the discount rate for liabilities over 30 years will be a weighted average of the existing LTRFDR and the yield of the 30-year SGS with the following weights applicable:

Year 1: 90%/10%

Year 2: 70%/30%

Year 3: 50%/50%

Year 4: 30%/70%

Year 5: 10%/90%

Year 6 onwards: 0%/100%

Where the duration of a liability is 20 years or less, the market yield of the SGS of a matching duration as at the valuation date will be applicable, and

Where the duration of a liability is more than 20 years but less than 30 years, a yield that is interpolated from the market yield of the 20-year SGS and the discount rate used for the liabilities of duration 30 years and above (as described earlier) will be applicable.

P1.1 Please see Section 4 on the Society's response on Proposal 1.

Proposal 2

MAS proposes to work with the industry to develop prescribed discount rates for specific jurisdictions. The development of the prescribed discount rates will take into account circumstances where the local government bond market may not be as liquid or is heavily influenced by the government's monetary policy. In such cases, the use of swap rates, with appropriate adjustments for credit risk, may be more suitable.

Meanwhile, for the purpose of the QIS, MAS proposes to retain the current methodology for valuing non-SGD denominated liabilities, where the risk-free discount rate to be used is the market yield of the foreign government securities of similar duration at the valuation date.



P2.1 The Society supports MAS' proposal to develop prescribed discount rates. However, we are of the view that the development work of non-SGD denominated discount rates should focus predominantly on the USD discount rate based on the ground of practicality. Treatment of USD discount rate curve should be developed after the discussion on SGD curve has concluded so as to ensure maximum consistency across the RBC 2 framework.

Proposal 3

MAS proposes to introduce a matching adjustment ("MA") to the risk free discount rate for life business, subject to eligibility criteria set out in later proposals.

The MA will be derived based on the actual bond portfolio that the insurers hold, the spread over the risk-free rate, and adjusted for the risk of default and downgrade.

The MA will be applicable for both SGD- and USD- denominated liabilities. A significant majority (almost 100%) of the life insurers' liabilities are denominated in these two currencies.

Consultation Question 2

MAS would like to seek feedback on the methodology to determine the spread for default and downgrade:

a) Is the approach to determine the cost of default and cost of downgrade as described earlier, appropriate? If not, how should they be determined?

b) Should the spread for default and downgrade be determined separately for SGD and USD corporate bonds? If yes, how can the spread for default and downgrade for SGD corporate bonds be determined given the data constraints?

c) The spread for default and downgrade is expected to be updated on an annual basis. Is this appropriate? If not, what would be an appropriate frequency for updating the spread for default and downgrade?

Proposal 4

MAS proposes to introduce the conditions that must be met before MA can be applied. The conditions are set out in Annex A (of MAS Consultation Paper).

Consultation Question 3

Are the requirements for the assets, products and constraints on cash flow mismatching specified in Annex A appropriate? Do you foresee any practical issues in complying with the MA requirements? If so, please give suggestions on how to fine-tune the MA framework.

P3.1 Please see Section 4 on the Society's response on Proposal 3, Proposal 4, Consultation Question 2 and Consultation Question 3.

Components of Required Capital

Proposal 5

MAS proposes to keep the broad classification of risk requirements under RBC 2, but with the following changes as set out in Annex B:

- *C1 will now include insurance catastrophe risk requirement (for both life and general business);*
- *C1 life insurance policy liability risk requirement will be split into the various components (namely, mortality (non-annuity) risk requirement, mortality (annuity) risk requirement, disability risk*



requirement, dread disease risk requirement, other insured events risk requirement, expense risk requirement, lapse risk requirement and conversion of options risk requirement);

- *C2 debt general risk requirement and liability adjustment requirement (collectively known as duration mismatch risk requirement under existing RBC) will be reclassified as interest rate mismatch risk requirement, and the C2 debt specific risk requirement will be subsumed under the new credit spread risk requirement;*
- *A single C2 counterparty default risk module will be introduced to cover all the various risks related to default of counterparties under current RBC (e.g. loan investment risk requirement, derivative counterparty risk requirement, reinsurance recoverable risk requirement, etc); and*
- *A new category, C4, will be introduced to cover operational risk requirement.*

P5.1 The Society is generally agreeable with the proposed reclassification of risk requirements, except that the C3 risk requirement should be removed and treated as a financial resource adjustment. This is to ensure that the asset does not attract a risk charge that is higher than its actual value.

Proposal 6

MAS proposes to allow for diversification benefits in the following ways:

- *Under C1 requirement for life insurers, the mortality (annuity), mortality (non-annuity), other insured events (accident and health) and life insurance catastrophe risk requirements will be combined using a prescribed correlation matrix;*
- *Within C2 requirement, the calibrated risk factors or shocks have already been adjusted downwards to take into account of the diversification across all asset risk types;*
- *For the interest rate mismatch risk requirement (under C2), some diversification between the insurance funds (with the exception of the participating fund) is recognised at the company level. This is because interest rates can only either move upwards or downwards at a given point in time; and*
- *Between C1 requirement and C2 requirement, the diversified sum of C1 and C2 is defined $\sqrt{C1^2 + C2^2}$*

The C3 and C4 requirements will be added to the diversified sum of C1 and C2 to give the Total Risk Requirements.

C1 insurance risk requirement

P6.1 The Society would like to understand how MAS determines the risk pairs to be included under the C1 correlation matrix for life business and the choice of the correlation parameter. This would give the Society an opportunity to provide more specific input on the technical aspect of the calibration.

P6.2 The Society is of the view that the C1 correlation matrix should be extended to all C1 components which includes lapse risk. For lapse risk, it is two-directional and either an upward or downward change in lapse rates may have an impact on solvency.

P6.3 The Society agrees that the diversification benefit within C1 risks for general insurance business should be recognised under the RBC 2 framework and we look forward to propose more input on this.



C2 interest rate mismatch risk requirement

P6.4 For the C2 interest rate requirement, the fungibility of capital is a financial resource issue and should be dealt with in the numerator of the capital ratio, not the denominator. The diversification between funds should be allowed in calculating the denominator. The adjusted vs unadjusted PCR mechanism (not available in the Solvency II framework) correctly depicts that any surplus in participative funds cannot be used to support other parts of the business but surplus can flow in the reverse direction.

Diversified sum of C1 and C2 risk requirements

P6.5 The Society is of the view that the independent assumption between C1 and C2 risks is reasonable.

P6.6 An explicit correlation between different C2 risks will be more helpful as it will help insurance companies' in planning their investment portfolio much easily. Current risk charges implicitly assume that diversification does not give any incentive to insurers to differentiate between investment strategies and therefore may not promote a right approach to sound investment and risk management. In fact, if the diversification benefit is built in to the risk charge based on an implicit diversification benefit, then a company may gain the benefit in capital without having the mix to actually achieve the diversification.

P6.7 The diversification between funds should not just be limited to interest rate risk but should be expanded to all risks. For example, mortality in one fund vs. annuity risk in another fund, credit spread risk in one fund with the credit risk in another fund or between lapse risks.

P6.8 It is not appropriate to completely rule out the Par fund from the fund diversification benefit. A proportion of the surplus in the par fund belongs to shareholders and companies should be allowed to take credit for this part.

P6.9 Further consideration should be given for products where lapses are correlated to market risks such as interest rate and spread. A good example would be Universal Life products. In these cases, a 0% correlation assumption may not be appropriate unless policyholder behaviour has been built into the valuation models.

C1 Requirement for Life Business

Proposal 7

MAS proposes to remove references to the prescribed mortality standard table.

P7.1 The Society agrees with MAS' proposal to remove references to the prescribed mortality standard table and to apply the mortality shock on the best estimate mortality rates instead.

P7.2 This approach places greater reliance on Appointed Actuaries to examine their internal deviation of the best estimate mortality assumptions.

Proposal 8

MAS proposes to apply a permanent 20% increase to the best estimate mortality (non-annuity) rate assumptions under RBC 2.

P8.1 The Society views that it is inconsistent to use volatility of 1 year actual versus expected mortality experience to calibrate the mortality shock, and then impose it on a long term best



estimate assumption. Instead, the mortality shock should be calibrated using the change versus expected mortality experience over a specific time horizon. This is consistent how mortality assumptions are set, which are usually based on 3 to 5 years rolling averages. For example, the shock could be calibrated looking at the distribution of mortality changes over a 5 year period, and then taking the 97.5th percentile of the distribution.

- P8.2 Based on the description of the on the calibration methodology highlighted in the consultation paper, the crude death rates for each year and each age group are assumed to be normally distributed. The shock is then derived from the normal distribution for each age group. The Society notes that the 10 years covered has seen notable mortality improvement. This would have increased the standard derivation of the distribution and would have led to a higher risk charge. The Society suggest that the calibration be carried out after allowing for mortality improvement based on secular trends seen in the wider population.

Proposal 9

MAS proposes to remove references to a prescribed standard table for annuities.

- P9.1 The Society agrees with MAS' proposal to remove references to a prescribed standard table for annuities when deriving longevity risk requirements, placing greater reliance on Appointed Actuaries to examine their internal deviation of the best estimate mortality assumptions.

Proposal 10

MAS proposes to apply a permanent 25% decrease to the best estimate mortality (annuity) rate assumptions under RBC 2.

- P10.1 As noted in P8.1, the mortality (annuity) shock should also be calibrated using the change of actual versus expected mortality (annuity) experience over a specified time horizon.
- P10.2 As alluded to in the consultation (Para 4.21) some companies explicitly take into account mortality improvements in their valuation assumptions and some do not. With the removal of the prescribed table for annuitants mortality companies are likely to review their assumptions and there may need to be some time allowed for them to develop longevity forecasting models to refine their best estimate.

Proposal 11

MAS proposes to apply a permanent 20% increase to the best estimate disability rate assumptions under RBC 2.

- P11.1 As noted in P8.1, the disability shock should also be calibrated using the change of actual versus expected disability experience over a specified time horizon.

Proposal 12

MAS proposes to apply a permanent 40% increase (where premium payable is guaranteed for the full duration of the policy), and a permanent 30% increase (where premium payable is not guaranteed for the full duration of the policy), to the best estimate dread disease incidence rate assumptions under RBC 2.

- P12.1 The Society agrees that the stress for policies where future premiums are non-guaranteed should be lower than those where they are guaranteed since premiums to policyholders may be increased when a stress event occurs. In this regard, a mere 10% difference in the stress appears too low as it suggests that the premium increase to customers, over time, in response to the stress, is limited to that amount.



Proposal 13

MAS proposes to apply a permanent 40% increase (where premium payable is guaranteed for the full duration of the policy), and a permanent 30% increase (where premium payable is not guaranteed for the full duration of the policy), to the best estimate other insured events (accident and health) incidence rate assumptions under RBC 2.

P13.1 The Society is of the view that further study is required to determine whether the calibrated shocks are appropriate.

P13.2 As noted in P12.1, a lower calibration for non-guaranteed policies is justify given the non-guaranteed nature of these policies, as exemplified by the recent increase in premium for in Integrated Shield plans.

Proposal 14

MAS proposes to apply a permanent increase/decrease of 50% to the best estimate lapse rate assumptions, whichever produces a higher liability value.

P14.1 The Society noted that MAS used historical data in statutory Form 13, which includes lapse information for first 5 policy years. The Society is of the view that lapse experience in early policy durations tend to be more volatile. Applying shocks calibrated from data of early policy durations on permanent increase may overstate the risk.

P14.2 As before in P8.1, the lapse shock should be calibrated using the change of actual versus expected lapse experience over a specified time horizon.

P14.3 The biting condition varies by product type. By adding the lapse risk requirements from all products which may be pointing to opposite direction implies 100% correlation between lapse risk of products, which is very severe. To allow for inter-product diversification, a lower calibration should be used.

Proposal 15

MAS proposes to apply a permanent increase/decrease of 50% to the best estimate assumptions of the conversion of options, whichever produces a higher liability value.

P15.1 No comments.

Proposal 16

MAS proposes to use +20% shock for the first year and +10% thereafter on the best estimate expense assumptions for the expense risk requirement.

P16.1 No comments.

Proposal 17

MAS proposes to apply a mortality shock of an additional 0.5 deaths per 1000, and a morbidity shock of an additional 40 hospitalisation claims incidence per 1000 to rates across all ages. The life insurance catastrophe risk requirement will be the additional capital required to be set aside.



P17.1 The Society notes that the calibration of this stress appears low in the current framework compared to international benchmarks. It is worth considering qualitative factors concerning Singapore that may make this reasonable. These are, for example, good government controls and contingency plans against pandemics and also an environment where livestock and human are not close to each other. On the other hand, major offsetting factors are that population density in Singapore is one of the highest in the world and it is a travel hub globally. Overall, we believe that more justification is required before implementing a factor that is low compared to the international benchmarks.

P17.2 There are many other natural/man-made events that can give rise to catastrophe. The calibration should not overly focus on pandemic events only.

P17.3 The calibrated risk factor on morbidity shock seems onerous. However, it may be deemed acceptable if the outputs of the current MAS-prescribed stress test scenario for morbidity catastrophe have been duly taken into account.

Proposal 18

MAS proposes to adopt the following correlation matrix when aggregating the C1 risk requirements for life business:

	Mortality (non-annuity)	Mortality (annuity)	Other insured events	Dread Disease	Catastrophe Risk	
					Mortality RR	Morbidity RR
Mortality (non-annuity)	1	-0.25	0.5	0.5	0.25	0.75
Mortality (annuity)	-0.25	1	0.25	0.25	0	0.25
Other insured events	0.5	0.25	1	0.5	0.75	0.5
Dread Disease	0.5	0.25	0.5	1	0.5	0.25
Catastrophe risk	Mortality RR	0.25	0	0.75	0.5	1
	Morbidity RR	0.75	0.25	0.5	0.25	1

The formula to derive the diversified C1 requirement for life business is as follows:

$$\sqrt{\sum CorrLife_{r,c} * Life_r * Life_c} + \{Disability RR + Lapse RR + Conversion of Options RR + Expense RR\}$$

where

$CorrLife_{r,c}$ = the entries of the correlation matrix

$Life_r, Life_c$ = RR for individual life sub-risks according to rows and columns of correlation matrix

The matrix can be further simplified (especially for the catastrophe risk) upon reviewing results from QIS.

P18.1 Refer to comments under Proposal 6 on scope and methodology.

P18.2 The Society views that the correlation factor between catastrophe (morbidity) risk and:

- Mortality (annuity) risk should be 0% or even negative (the value will necessarily be arbitrary);
- Other insured events risk should also be 0% given that, for a life insurer, other insured events risk consists mainly of morbidity (health) and accident risks: The catastrophe risk requirement is built onto the basic accident and health risk requirement and allowing for some correlation between the two risks appears to be double counting;



- Dread disease risk should also be 0%, as morbidity catastrophes are usually caused by infections, like SARS, and not by the conditions covered under dread diseases policies.

C1 Requirements for General Business

Consultation Question 4

Do you have any suggestions relating to the subsequent recalibration of the premium and claim liability risk requirements for general business, e.g. the level of granularity, methodology, data to be used?

CQ4.1 The current premium and claim liability calibrations will include an allowance for catastrophe risk so need to make sure that there is no double counting of catastrophe risk charge once the natural catastrophe requirements are finalised.

CQ4.2 To avoid double counting when the CAT risk requirement for General Insurance business is introduced, the society suggests a reference to APRA's approach (1-in-200 year basis, 3 * 1-in-10 and 4* 1-in-6 non-natural peril). However, data and modelling issues need to be considered.

C2 Requirement

Proposal 19

MAS proposes to account for diversification benefits implicitly within the calibrated C2 risk requirements, instead of introducing an explicit correlation matrix to aggregate the C2 risk requirements.

The implicit diversification will be monitored on a regular basis to ensure that the C2 risk requirements remain appropriate. In addition, MAS reserves the right to impose additional capital requirements above the PCR for insurers whose risk exposures differ significantly from the industry average such that they should not enjoy the implied diversification benefits.

P19.1 The Society disagrees that the implicit diversification benefits should be incorporated and would encourage explicit diversification to be used instead. We are keen to work together with MAS to review the C2 risk factor calibrations. While the proposed approach is simple to apply, the Society is of the view that this approach may not fully differentiate between companies that are well-diversified and those that are not.

P19.2 With consideration of MAS recalibrating factors on an ongoing basis, it is worth noting that the calibrated factors should not be changing drastically between successive periods, given that this may cause the reported solvency position to fluctuate substantially. Adopting an explicit correlation matrix will avoid the need to set assumptions on the implied asset mix.

P19.3 The Society would also like to suggest to MAS to disclose the circumstance under which it is likely to impose additional capital requirements above PCR, such that preventive actions are put in place and embedded into companies' own capital contingency plan.

P19.4 We are of the view that it is important to promote a better risk management culture. As such, there should also be a lower capital requirement than PCR if the differing risk exposure leads to significantly higher diversification benefits.



Proposal 20

MAS proposes to introduce 3 distinct risk categories for equities and apply the following factors, which already takes into account the diversification benefits implicitly, to the market value of each equity exposure:

- a) Listed in Singapore/ Developed Markets: 40%*
- b) Listed in Other Markets: 50%*
- c) Unlisted Equity (including private equity and hedge funds): 60%*

The equity investment risk requirement is then taken to be the aggregate of the calculations for all equity exposures

*For Developed Markets, reference will be made to MSCI Inc's list of countries in MSCI World Index. The list can be found in the QIS technical specifications (**MAS QIS 1 Annex D**).*

- P20.1 The MAS has used 10 years' historical data and derived the risk requirement based in the lower 0.5% percentile of the resulting empirical distribution which has more than 2,500 data points. This calibration is highly sensitive to the worst decline in equity prices when daily 1-year rolling returns were used. The equity risk charge appears to be too high, especially in the context where insurers will be putting up more than 40% of their equity exposure to back the equities that they invest in.
- P20.2 The MAS should consider using a longer data set. The last 10 years' data covers one of the most stressed times in the financial history including some of the most adverse movements and a high volatility period. As a result, the calibration may have overstated the shock level.
- P20.3 The diversified factors under RBC 2 are relatively high as compared to other regimes such as Europe and Australia.
- P20.4 The Society agrees that there should be a distinction between equities listed in Singapore/Developed Markets and Other Markets. Considerations must be given to the appropriateness of including hedge funds in "Unlisted Equity"
- P20.5 The Society suggests working with MAS to review the calibrations, as well as the groupings, including possible groupings for Private equity and hedge funds, after the results of QIS1.



Proposal 21

MAS proposes to allow insurers to apply the 'look-through' approach more extensively for collective investment schemes ("CIS"). Insurers are allowed to base the computation of the risk requirement on the actual allocation of the underlying assets of the CIS, or as an alternative, in reference to the investment mandates of the CIS but in a manner that produces the maximum overall risk requirement. If the insurer chooses not to apply the look-through approach, it can apply a 50% risk charge on the market value of the CIS instead.

Insurers who choose to adopt a look-through approach must maintain and provide sufficient evidence to demonstrate that their allocation of the underlying investment exposures of the CIS into the relevant risk requirement modules is justifiable and reasonable.

P21.1 There may be practical difficulties associated with the look-through approach as granular data on underlying investments may not be readily available.

P21.2 The Society suggests revising the risk charge of 50% to 60% as per unlisted equities if the insurer chooses not to apply the look-through approach. There is therefore an incentive for the insurer to apply the look-through approach to the underlying assets.

Consultation Question 5

Is it useful or necessary to incorporate a countercyclical adjustment mechanism within the equity risk requirement under RBC 2?

CQ5.1 The Society supports cyclical adjustments. Without it, insurers will be forced to crystallise losses into a down market in order to maintain its PCR, reducing the likelihood of subsequent natural recovery. A well designed adjustment mechanism is important given that RBC 2 is calibrated to a 1 year-risk horizon. This is particularly appropriate for the life insurance as life insurance contracts are typically long term.

CQ5.2 The market reversion behaviour is actually stronger historically when it comes to credit spread versus equity. Please refer to the spread behaviour of US corporates in the past 100 years. Therefore, counter-cyclical measure must cover spread risk.

Consultation Question 6

MAS would like to invite industry feedback and comments on how a suitable counter-cyclical mechanism can be designed for RBC 2?

(a) Are the above principles appropriate? Are there any others that should be considered?

(b) What modifications should be made to the approach in paragraph 4.65 so that it would be in line with the guiding principles?

(c) Are there other possible approaches that should be considered?

CQ6.1 The Society agrees with MAS that the formulae should be pre-determined, based on sound basis and easily explainable. In particular, the Society is of the view that a clear and transparent CCA mechanism is important for the insurers' capital planning (consistent with the objective of ORSA), as well as to ensure level playing field.

CQ6.2 The Society agrees that CCA should be activated upon significant movements, but disagree that it is only applied to equity. We see a need to define what is deemed as significant, and also whether it should be variable yearly (to be balanced with the point above). The risk



requirement just before and after the trigger points should be continuous instead of discreet to prevent the “cliff/jump” behaviour.

- CQ6.3 The Society disagrees that the application of these measures only confined to Singapore listed equities. Being principle based, CCA should apply to all classes that exhibit reversion behaviour. Non-Singapore listed equity should be considered at the minimum. The counter-cyclical mechanism should aim to prevent individual insurers from being forced to crystallise losses in a temporary down market, and reducing their likelihood to return to health subsequently. With insurers in Singapore having substantial investment outside of Singapore, the counter-cyclical measures should cover beyond Singapore assets (e.g., MSCI World / MSCI Asia should also be included into the formula.).
- CQ6.4 The Society broadly agrees with an appropriate proxy. There is a balance to be struck between ease of application and risk sensitivity. Nonetheless we are of the view that CCA should not be dependent on how diversified is the insurers holding, as CCA should seek to reflect the systemic risk component of price movement. Therefore, STI seems appropriate (likewise for other market indices).
- CQ6.5 On adjustment not causing significant deviation, we are of the view that the adjustment should reflect the strength of the reversion behaviour in the observed risk type. Nonetheless we are agreeable to a cap, similar to the SII standard formula.
- CQ6.6 Based on our initial findings, the symmetrical adjustment approach being discussed in Solvency II is a good starting point; and should be extended to credit spread. However, a simple 3 year period may not be appropriate. It has to be regime-based. We believe that the adjustment mechanism needs to reflect the changes in the level of risk reasonably accurately.
- CQ6.7 The formula is restricted to equity movements. The Society believes that CCA should be considered for other investment markets that may also suffer, e.g., bond markets. A countercyclical adjustment should be made on all asset classes where reversion behaviours can be observed. Credit spread is also likely to be a candidate for consideration.
- CQ6.8 The Society’s Life Insurance Committee has formed a working party to examine CCA in details. This includes the formulae, the scope as well as the activation level.

Proposal 22

MAS proposes to apply the same set of interest rate adjustments on both the insurer’s debt securities as well as policy liabilities. Interest rate adjustments will be based on prescribed increasing and decreasing percentage changes rather than absolute changes. The interest rate mismatch risk requirement will be based on the interest rate scenario that will give rise to a bigger fall in net asset value.

For clarity, the upward and downward interest rate adjustments in the table below are to be applied to the risk free yield curve. The interest rate adjustments, which already account implicitly for diversification benefits, and subject to a maximum absolute interest rate adjustment of 200 basis points (based on historical observations of the SGS and US Treasury yield curves), will be applied as follows:



Time of Cash Flow	Upward Adjustment (%)	Downward Adjustment (%)
3M	100	-70
6M	100	-60
1Y	100	-60
2Y	100	-60
3Y	100	-60
4Y	90	-50
5Y	80	-50
6Y	80	-50
7Y	70	-40
8Y	70	-40
9Y	60	-40
10Y	60	-40
11Y	60	-40
12Y	60	-30
13Y	60	-30
14Y	60	-30
15Y	50	-30
16Y	50	-30
17Y	40	-30
18Y	40	-30
19Y	30	-30
20Y+	30	-30

P22.5 It may be more appropriate to update the shocks on an annual basis.

Proposal 23

MAS proposes to recognise diversification between insurance funds (other than the Participating Fund) when calculating the interest rate mismatch risk requirement at the company level.

The QIS technical specifications in Annex D sets out instructions on how such diversification benefits are to be calculated. Insurers will first determine a “dominant scenario” for the company as a whole, this scenario being either the upward or downward scenario, which results in the higher aggregated loss across all insurance funds (excluding the Participating Fund).

P23.1 The Society generally supports MAS’ proposal to recognise diversification between insurance funds when calculating the interest rate mismatch risk requirement at the company level and proposes that the diversification should extend to the Participating fund as well.

P23.2 The Society also suggests MAS to consider the diversification benefits for insurers that write Health, Life and General Insurance business.



Proposal 24

MAS proposes to apply the following credit spread risk shock (expressed in basis points) to the debt portfolio, which takes into account diversification benefits implicitly:

Term\Credit Rating*	AAA	From AA- to AA+	From A- to A+	From BBB- to BBB+	From BB- to BB+	B+ and below
Up to 5 years	140	160	190	250	420	580
Between 5 to 10 years	130	150	180	240	380	540
> 10 years	100	120	150	200	340	490

Credit spread risk requirement will also apply to the portfolio of policy liabilities which have been separately held under the Matching Adjustment (“MA”).

Insurers will be required to revalue their debt securities, as well as their policy liabilities held under the MA portfolio; resulting from the upward basis point increase in credit spread to derive the credit spread risk requirement. More instructions (and a few examples) can be found in the QIS technical specifications.

The credit spread risk requirement would be the change in net asset value, after applying the proposed credit spread shocks to both assets and liabilities.

*Insurers are expected to perform an appropriate level of due diligence prior to the use of any credit rating for the purpose of calculating regulatory capital requirements.

P24.1 The Society agrees with the proposal to apply credit spread risk calculation to both asset and liability sides.

P24.2 Bonds issued by Statutory Boards should be considered as government linked bonds and excluded from credit spread risk calculation. (e.g. Temasek bond).

Proposal 25

MAS proposes that for corporate bonds issued by Singapore Statutory Boards and multilateral agencies, the applicable credit spread shocks will be that corresponding to the sovereign rating of the Singapore Government, which is currently at “AAA”.

MAS will be working with the industry on options to encourage rating of unrated bond issuances. Meanwhile, for the purpose of QIS, a credit spread shock of between “BBB” and “BB” will be applied for unrated SGD issues (other than those issued by Singapore Statutory Boards and multilateral agencies)

P25.1 A number of respondents suggested that the MAS should consider allowing the internal rating models in the evaluation of credit ratings.

P25.2 Encouraging the rating of unrated bond issuances has the following advantages:

- Certain assets which are high quality may not be rated due to a variety of reasons. These assets will be helpful in providing long term liquidity in the market.
- Many insurers would have their own internal credit rating approach to determine the creditworthiness of unrated bonds. This saves cost of obtaining rating and encourages insurers to form its own views about what they invest in. This is in line with the spirit of ORSA.



- On governance, MAS could specify the criteria of admissible internal credit rating approach. This can take the form of regulatory approval, or requiring external auditor certification of compliance with the criteria.

Proposal 26

MAS proposes to only exempt the debt securities issued or fully guaranteed by governments or central banks of countries or territories with a credit rating of at least “A-” from the credit spread risk requirement.

For debt securities issued or fully guaranteed by governments or central banks of countries or territories with a credit rating of below “A-” and in the national currency of the country, these should be notched up to the next higher credit rating, when deriving the applicable credit spread risk shock (as set out in the table under Proposal 24).

P26.1 This concession should apply only if the debt is issued in the issuer's home currency.

Proposal 27

MAS proposes to introduce some risk charging rules for structured products.

For structured products,

a) Counterparty default risk requirement will be applicable and to be computed based on the credit rating -of the product offeror. Insurers are to apply the counterparty default risk charge in Proposal 30 below to the market value of each structured product;

b) Market risk requirement will also be applicable:

(i) For credit-related structured products, the credit spread risk requirement is applicable and based on the following credit spread adjustment table. Insurers will be required to revalue their structured product resulting from the upward basis point increase in credit spread to derive the credit spread risk requirement.

Term\Credit Rating*	AAA	From AA- to AA+	From A- to A+	From BBB- to BBB+	From BB- to BB+	B+ and below
Up to 5 years	220	260	300	400	670	930
Between 5 to 10 years	210	240	290	380	610	860
> 10 years	160	190	240	320	540	780

The above credits spread shocks are higher than that prescribed for corporate bonds of similar credit rating and duration. This is based on observations that credit-related securitisations tend to exhibit greater volatility during times of crisis, as compared to similar rated corporate bonds.

(ii) For other types of structured products, insurers are to determine the appropriate market risk-related capital requirements by looking through to the underlying reference assets or risks and applying the relevant risk requirement module. Insurers should determine the capital treatment of the underlying investments based on its economic substance rather than its legal form.

Given the wide variability in the design of the structured products, the onus will be on insurers to determine and justify the risk charging, provided that it meets the above principles. As an alternative to applying a look-through approach, insurers will be allowed to apply a flat 50% risk requirement on the entire marked-to-market value of the investment.

*Insurers are expected to perform an appropriate level of due diligence prior to the use of any credit rating for the purpose of calculating regulatory capital requirements.



- P27.1 Applying a flat 50% risk requirement for structure products including CAT bonds and other Alternate Risk Transfer products is excessive.
- P27.2 It will be very difficult to decompose structure products (e.g., credit linked bonds) into a bundle of structured products with equivalent cash flow, especially when there are caps/ floors/ knock-outs and other exotic features.
- P27.3 The same payouts can be decomposed into different equivalent bundles of cash and derivative holdings. Because current treatment of options are not entirely risk sensitive (focusing only on change in intrinsic value), the different ways of decomposing can lead to different risk charge. Not to mention, not all the components of the bundle have readily observable market price.
- P27.4 The treatment of options in RBC 2 needs to be fixed first before any discussion about decomposition can take place.
- P27.5 A flat rate of 50%, while practical, will create a perverse incentive for insurers to hold only those structures that are riskier than the risk charge implies. Some may even argue that a diversified portfolio of (toxic) structures will give a good risk-adjusted return on regulatory capital.

Proposal 28

MAS proposes to impose the following property risk charge, which already takes into account of the implied diversification benefits, to the current market value of each property exposure. The property investment risk requirement is then taken as the aggregate of the calculations for all property exposures:

a) Immovable properties: 30%;

b) CIS invested in property assets that are for investment purposes: 35%.

For avoidance of doubt, investments in companies engaged in real estate management or project development, or similar activities, should be considered as equity investments instead of property investments for the purpose of risk charging.

P28.1 No comments.

Proposal 29

MAS proposes to impose a foreign currency mismatch risk charge of 12% (after taking into account the implied diversification benefits) to both the SIF as well as the OIF.

The current 10% concession for foreign currency mismatch requirement calculations for SIF will be removed.

A concession of 20% of the total value of fund assets will apply for the OIF when computing the foreign currency mismatch risk requirement.

Example

Insurers are still required to convert their net open position in each currency to Singapore Dollar at the prevailing spot rate. The risk exposure is still taken as the higher of (a) the aggregate of net open positions in all currencies where the net open position is positive, and (b) the absolute for currencies where it is negative. The foreign currency mismatch risk requirement is then:

- 12% of the calculated exposure, in the case of SIF; or*



• 12% of the calculated exposure less 20% of the total value of assets in the fund, in the case of OIF, subject to a minimum of zero.

P29.1 The Society noted the potential impacts of removing the 10% concession for foreign mismatch requirement calculations for SIF. While the asset supply has grown over the past 8 years (2004 to 2008), due consideration should be given to the growth in the outstanding insurance liabilities. Given the large size of the Singapore Life Funds, the available of local assets remains short. This is especially for larger funds (e.g. Par Funds) where investment in foreign assets is still necessary. Considerations should be given to the risks of asset concentration in a single country.

Proposal 30

MAS proposes to use the following table for counterparty default risk requirement:

Rating	Default Risk Charge (%)
AAA	0.5
From AA- to AA+	1.0
From A- to A+	2.0
From BBB- to BBB+	5.0
From BB- to BB+	10.5
From B- to B+	20.0
CCC+ and below	48.5

For reinsurance recoverables and outstanding premiums for direct insurance and facultative reinsurance business, the table above is only applicable for exposures that are of one year or less. Exposures that are outstanding for over one year will be given a 100% risk charge.

For treaty reinsurance business, the table above is applicable for reinsurance recoverables and outstanding premiums that are outstanding for two year or less. Exposures that are outstanding for over two years will be given a 100% risk charge. Unrated counterparties that are insurers (including reinsurers) are to be treated as having a rating of “CCC+ and below”, and the default risk charge of 48.5% will apply.

Unrated counterparties that are persons other than an insurer (including reinsurer) are to be treated as having a credit rating of between “BB- to BB+” and “BBB- to BBB+”, that is, the default risk charge of 7.75% will apply.

Insurers are expected to perform an appropriate level of due diligence prior to the use of any credit rating for the purpose of calculating regulatory capital requirements.

On Counterparty Risk

P30.1 There should be a distinction between premium 'past-due' versus 'unbilled' where the former is more subject to counterparty risk.

P30.2 The risk charges applied to premium receivables should be reformulated. It does not appear reasonable to apply a risk charge of 100% to premium which is contractually obliged but is not due to be collected in more than 12 months due to the payment structure of the contract. The risk charge does not necessarily need to be 0% but 100% is inconsistent with the rest of the regulation.

P30.3 The exposure should be determined net of collaterals.



On Suitability of using Credit Ratings

- P30.4 The Society is of the view that ageing exposure split by ratings is too granular for general insurance and reinsurance companies.
- P30.5 We also suggest that it is more suitable to treat unrated SMEs same as unrated persons/policyholders rather than (re)insurers. The former attracts a charge of 7.75% but 48.5% in the latter. Business sold through brokers to SMEs which are unrated will get hit by a 48.5% risk charge from day 1.
- P30.6 The Society is of the view that subsidiaries of a group may not pose greater counterparty risk even though they are unrated, so should not be treated with default risk charge of 48.5%. The risk charge of 7.75% appears more appropriate in this case.
- P30.7 There may also be practical considerations if the credit rating of each of the counterparties is not currently captured by (re)insurers.

Other General Comments

- P30.8 Internal reinsurance should be recognised for general insurance companies.
- P30.9 Diversification benefits should be allowed between counterparties.
- P30.10 The treatment for derivatives, policy loans, collateral etc is not well defined in the CP.

Proposal 31

MAS proposes to remove references to the licensing status of the reinsurance counterparty from the reinsurance adjustment formula (i.e. the reinsurance counterparty factor B). The counterparty default risk requirement table set out in the earlier proposal will be used for the computation of the reinsurance adjustment.

C3 Requirement

Consultation Question 7

Notwithstanding that additional risk requirements will be incurred under C3, insurers can still use concentrated assets to meet the liabilities and risk requirements. Whilst this is not of immediate concern as our insurers typically hold diversified assets, what additional safeguards can be introduced to minimise such risks, other than imposing hard concentration limits?

- CQ7.1 The Society is of the view to remove the C3 requirements because insurers are expected to maintain PCR > 100%. Therefore, for every dollar of assets exceeding the concentration limit the insurer is effectively holding more than a dollar of capital. This is inappropriate. C3 requirements should be removed and instead to be replaced by a deduction of financial resource.
- CQ7.2 The asset deduction should be changed from fund level to company level.



C4 Requirement

Proposal 32

MAS proposes the C4 operational risk requirement to be calculated as follows, subject to a cap of 10% of the total risk requirements (after applying the diversification benefits but excluding the operation risk requirement itself, to avoid circularity in computation):

$x\%$ of the higher of the past 3 years' averages of

- a) Gross written premium income; and
- b) Gross (of reinsurance) policy liabilities

where $x = 4\%$ (except for investment-linked business, where $x = 0.25\%$)

MAS will further fine-tune $x\%$ and cap based on the QIS results.

Consultation Question 8

Is the proposed operational risk requirement appropriate? Please provide reasons if you are of the view that it is more appropriate to address operational risk fully under the insurer's own economic capital under ERM.

P32.1 The Society's Operational Risk Working Party conducted a study on the major Life, General and Reinsurance companies and noticed that the cap was being triggered for almost all cases, suggesting that the proposed calibration factors are too high.

Operational Risk Formula – Life Insurance

P32.2 On comparison purely between EU's Solvency II formula and the proposed operational risk charge formula, the Operational Risk Working Party noted that the operational risk charge for life companies under RBC 2 (4%) is 9 times higher than operational risk charge under Solvency 2 (0.45%). Please refer to table 1 below. The cap is triggered for every life insurance company.

Table 1

Jurisdiction	Highest of a % of premium and reserves			% of AUM	Capping?
	GI	Life excl IL	IL		
Singapore RBC2	4%	4%	0.25%	0%	Yes
Europe Solvency 2	3%	0.45%	NA*	0%	Yes
Australia GPS118 and LPS 118	2 to 3%**	2 to 3%**		0%	No
Taiwan	1.50%	0.5% to 1%***		0.25%	No

* 0.25% of yearly expenses incurred in respect of IL policies

** 2% for reinsurance inward, 3% for others

*** 0.5% for life business, 1% for annuity business and 1.5% for all other businesses

P32.3 The cap on TRR (C1 to C3) suggests companies to focus on asset risk and insurance risk but not operational risk.

P32.4 It is unclear why ILP attracts a lower risk charge. It is more transparent to list the categories of operational risk events that C4 is meant to cover, and how different business lines contribute to them.



P32.5 The proposed risk charge for Non-linked business (i.e. 4% of liabilities) is too excessive. Applying the same x% to both earned premium income and gross policy liabilities may not be appropriate, given the fact that on a relative basis, new business exposes an insurer to greater operation risks (e.g., market conduct, product development, system implementation, expense over-run, etc) compared to in-force business.

Operational Risk Formula – General Insurance

P32.6 Using gross policy liabilities could lead to extreme volatility (e.g., for small specialist insurers immediately following a large claim, or for small/medium property (re)insurers immediately following a catastrophe. Net liabilities should be considered instead.

P32.7 There should be a distinction between reinsurance business and direct business. In particular, reinsurance companies should apply a lower operational risk charge- given that reinsurance business involves fewer individual policies, claims-processing activities and lower sales & marketing risk.

P32.8 In general, non-life insurers may utilize a high level of reinsurance, and so the operational risk factors calculated on a gross basis would result in triggering the 10% cap quite easily.

Consultation Question 8

CQ8.1 Operational risk crystallises either as higher claims or expenses, which, unlike banks, insurers have already provided risk charge for in the C1 module. So, adopting bank's approach of deriving operational risk capital from ground up will lead to double-counting of risk. The proposed calibration is likely to be excessive.

CQ8.2 The default of insurance companies in history is mainly not operational risk triggered (with an exception of HIH due to misselling), so questioning the significance of an operational risk charge.

CQ8.3 The proposed formula does not appear to represent/capture operational risk entirely. However, operational risk charge is hard to estimate accurately due to no agreed model, methodology as well as lack of data.

Recommendation

CQ8.4 With the reasons stated above, the society is not in favour of a standardised operational risk requirement which is not related to the quality of management of this risk.

CQ8.5 The Society suggests to remove C4 and to include operational risk under ERM/ORSA framework. MAS could still apply additional a capital charge if a company's ERM framework proves to be inadequate.

Components of Available Capital

Proposal 33

MAS proposes to introduce a new category of CET1 for licensed insurers incorporated in Singapore consisting of the following items:



(i) Surplus of insurance funds (excluding Participating Fund);
(ii) Surplus account of the Participating Fund;
(iii) Surplus of overseas branch operations;
(iv) Paid-up capital; and
(v) Retained earnings (currently known as unappropriated profit or loss).
less the aggregate of reinsurance adjustments of all insurance funds and any financial resource adjustment

P33.1 For some insurers, retained earnings include surplus in insurance fund. The current RBC wordings should be retained to remove double counting.

Proposal 34

MAS proposes the following changes:

- a) Rename Approved Tier 1 capital as Additional Tier 1 (AT1) capital;
- b) Irredeemable and Non-Cumulative Preference Shares, currently a standalone item under Tier 1 resource, will be subsumed under AT1 capital, provided they meet the criteria for AT1 capital instruments set out in Section 3 of Annex C;
- c) Rename Qualifying Tier 2 capital as Tier 2 capital;
- d) Irredeemable and Cumulative Preference Shares, currently a standalone item under Tier 2 Resource, will be subsumed under Tier 2 capital, provided they meet the criteria for Tier 2 capital instruments set out in Section 4 of Annex C.

P34.1 No comments.

Proposal 35

MAS proposes to do away with the approval regime for insurers planning to issue AT1 and Tier 2 capital instruments which meet the criteria set out in Sections 3 and 4 of Annex C. If the capital instrument contains features which may affect such criteria being met, insurers must still seek MAS' approval prior to issuance, and submit the necessary documents.

Insurers intending to issue AT1 and Tier 2 capital instruments are encouraged to discuss their plans with MAS early before doing so.

Transitional Arrangements

Capital instruments which have been approved by MAS prior to RBC 2 implementation date will be subject to the transitional arrangements set out in Section 5 of Annex C.

P35.1 No comments.

Proposal 36

MAS proposes to introduce the following floors on CET1 and Tier 1 capital:

- (a) CET1 capital \geq 65% of the Total Risk Requirements (excluding Participating Fund) (only applicable for licensed insurers incorporated in Singapore); and
- (b) Tier 1 capital \geq 80% of the Total Risk Requirements (excluding Participating Fund).

Consultation Question 9

Are the proposed minimum levels of CET1 and Tier 1 capital appropriate? If not, how should they be determined?



P36.1 The Society agrees that using TRR as the basis to determine limits is a better approach compared to current treatment.

Proposal 37

MAS proposes to incorporate a principal loss absorption (“PLA”) feature for AT1 capital instruments.

This means that capital instruments that qualify as AT1 capital must:

- (a) Be converted to ordinary share capital; or*
- (b) Be written down by the amount of breach in the CET1, upon a significant breach of CET1 capital.*

A significant breach of CET1 capital is defined as the level where CET1 capital drops below 70% of the Total Risk Requirements (excluding Participating Fund).

Insurers will be given flexibility to increase CET1 capital by other means, for example, capital injection, instead of writing down AT1 or converting it to ordinary shares.

Consultation Question 10

Are the trigger points for the proposed PLA feature appropriate? If not, how should the trigger points be determined?

Consultation Question 11

Do you agree that it is useful to require AT1 and Tier 2 capital instruments for insurers to contain the PONV feature to ensure their loss absorbency at the point of non-viability? Please give reasons for your answer.

P37.1 No comments.

CQ10.1 No comments.

CQ11.1 No comments.

Treatment of Negative Reserves

Proposal 38

MAS proposes to allow a part of the negative reserves to be recognised as a form of positive regulatory adjustment under Financial Resources. The amount of negative reserves to be recognised will be:

x% of the total amount of negative reserves computed after applying all the applicable RBC 2 insurance shocks

where x= 50%, except for investment-linked fund, where x=25%. The lower factor is applied for investment-linked policies in view that the lapse experience tends to be more volatile due to the investment element of such products.

P38.1 Given that negative reserve is computed after applying all insurance shocks, the basis is already overly prudent. Therefore 100% allowance should be granted. We also noted that the other jurisdictions have not applied insurance shocks to the negative reserves.

P38.2 Lowering recognition for ILP due to lapse risk is not appropriate because the admissibility of negative reserve admissible is already after C1 shocks.



P38.3 There is an inconsistency issue in current valuation of ILP. The discount rate and asset growth rate should generally agree. However, market practice is such that unit growth rate is usually set to best estimate but discount rate is using risk free. In contrast, there is no such inconsistency in valuation of par business – Minimum Condition Liability is based on guaranteed benefits and risk free rate, where Gross Premium Valuation is based on best estimate asset growth and discount rate. Once the anomaly in ILP is corrected, the negative reserve from ILP should be much lower across the industry, and the same credit can be given to all product class.

Proposal 39

MAS proposes to give insurers the same partial recognition for negative reserves at the insurance fund level.

Consultation Question 12

MAS is open to the reviewing the limits, subject to the necessary safeguards being put in place. What additional safeguards or prudential filters can be introduced to ensure that the amount of negative reserves to be recognised for solvency purposes remain appropriate and prudent?

P39.1 The Society agrees that recognition for negative reserves at both company and fund level is appropriate.

Treatment of Aggregate of Allowances for Provision for Non Guaranteed Benefits

In general, the asset shocks and modules are quite consistent with Solvency II. However, one key element that separates them is in the valuation of liabilities. Solvency II allows the ability to reflect bonus or crediting rate adjustments while RBC 2 does not allow for this directly when the risk charges are determined. It is only allowed as a separate FR adjustment and is capped at 50%. This will cause a higher capital base and create more strain because insurers will normally target a CAR much higher than 100%. Furthermore, this may not correctly reflect the risk profile of the product when a prescribed asset shock within C2 is performed. This may ruin the viability of products like Participating and UL where the loss absorption capability is key.

Given the significant increase in the risk requirement, the Society proposes that the financial resources for non-guaranteed benefits should be up to 100% recognition rather than 50% after taking into account the insurer's bonus philosophy. The Society would like to reiterate that loss absorption capability is a key feature of Participating products. A cap in the FR recognition, coupled with a significant higher calibration, will affect the viability of Par products.

Consultation Question 13

Do you have any suggestions on the safeguards or conditions that can be put in place to mitigate the risks set out above and demonstrate effective risk transfer, so as to allow recognition of the reinsurance arrangement?

CQ13.1 Internal reinsurance no longer gives credit, which could change the structure of the reinsurance program for branches.

CQ13.2 Internal reinsurance – rather than giving no credit altogether, possibly a reduced credit or preferably assess the head office as a counterparty with a lower credit rating.

CQ13.3 The Society also suggests the assessment of the policy liability and / or capital to be on both gross and net of the external reinsurance.



Treatment of OIF for Reinsurers

Proposal 40

MAS proposes to continue to exempt the OIF of foreign-incorporated licensed reinsurers (i.e. reinsurance branches) from the solvency requirements.

Proposal 41

MAS proposes to continue to subject the OIF business of foreign-owned locally incorporated reinsurers to the current simplified solvency requirement (i.e. remain status quo).

Proposal 42

MAS proposes that the OIF of locally-owned locally incorporated reinsurer be subject to full RBC 2 requirements. Appropriate transitional arrangements will be provided for affected reinsurers.

P42.1 Just as reinsurance adjustments are independent of registration status, the same principle should apply across Proposals 40-42.

Quantitative Impact Study

Consultation Question 14

Please highlight any implementation issues experienced in conducting the detailed QIS specifications.

CQ14.1 Not applicable.

Proposed Timeline and Transitional Provisions

Proposal 43

MAS expects to finalise the calibration factors and features of the RBC 2 framework by 2014 and formally implement the RBC 2 requirements from 1 Jan 2017, subject to further consultation with the industry.

There will be a later implementation date (to be advised) for the general insurance catastrophe charge and the revised C1 risk requirements for the general business.

Consultation Question 15

Do you expect difficulty in meeting the expected implementation timeline? Please elaborate.

Consultation Question 16

Which are the proposals that will require a longer transitional arrangement, and why?

Consultation Question 15

CQ15.1 The time and effort needed to undertake research and analysis arising from this round of consultation/QIS should not be under-estimated. A more realistic timeline would be for QIS2 to commence in Q2 2015. MAS should share its findings from QIS some time in Q4 2014 and have additional discussion with the industry (including the Society) in preparation for QIS2.

Consultation Question 16

CQ16.1 The change in discount rate method may require a longer transition period if the interest rate environment at 1/1/2017 is at similar level as of today.



Section 4 Matching Adjustment and Valuation Interest

EXECUTIVE SUMMARY ON SECTION 4

4.1 In March 2014, the Monetary Authority of Singapore (“MAS”) published its second consultation paper on the review of existing Risk Based Capital framework (“RBC 2 review”) seeking feedback on its proposal for changes to the valuation discount rate. Key proposed changes include:

- Gradual transition to market yields for the basic valuation discount rate at 30 years and using a flat yield beyond 30 years. In particular, the MAS proposes to remove the existing the LTRFDR mechanism;
- Inclusion of matching adjustment as a positive adjustment to the valuation discount rate subject to certain criteria. The impact of including the matching adjustment will be available on balance sheet.

4.2 SAS has formed a working party to prepare Actuarial Profession’s feedback on the above mentioned proposals. This report sets out observations and recommendations of this working party and proposes to discuss these with the MAS in more detail. The primary focus of this report is commenting on the matching adjustment and we propose to work with the MAS and industry groups on the issues related to basic valuation discount rate.

Key observations and recommendations from our work include:

- In its current form, the matching adjustment does not recognize the underlying illiquid nature of all insurance liabilities. We therefore propose that the MAS consider allowing for partial recognition of illiquidity for all types of liabilities through approaches such as the volatility adjustment (“VA”). In order to avoid any cherry-picking by insurers, we propose certain safeguards be put in place. Key proposals are:
 - A volatility adjustment is allowed for all insurance liabilities and is set by the MAS using an industry reference portfolio. The decision to apply the VA will lie with the insurance company.
 - Calculation of VA will be based on a high quality asset portfolio and typical proportion of assets in that portfolio (termed in this report as the reference portfolio).
 - Impact of VA will be an on balance sheet item and will be subject to a bi-directional credit spread stress (an increase and decrease in credit spreads) to avoid any cherry picking by insurers
 - Once VA is chosen to applied, it will have to always be applied.
- In addition to VA, it is recognized that insurers are able to use different combination of assets to construct portfolios that are at least as good, if not better, match to the liquidity characteristics of the liabilities than the industry reference portfolio. In that case, insurers will receive matching adjustment as per the existing MAS proposal subject to certain changes in criteria as suggested in this report. Where matching adjustment is applied for a particular product/ product group, VA will not be available.
- We believe certain criteria for the matching adjustment application are too stringent in the Singapore market context and propose that the MAS consider revisiting these criteria. In particular,



- We would like to highlight the shortage of long term assets in Singapore market and the feasibility of 'cashflow shortfall' criterion. The MAS should consider how the supply of the long term assets can be replenished over the next few years in light of increasing volume of long term liabilities. In addition, the MAS should consider allow including assets other than government and corporate bonds to address the shortage of long term assets.
- Further clarification should be provided on the requirement to separately manage the assets and liabilities and whether it puts any legal requirements to manage separate insurance funds. Our interpretation is only an earmarking of assets is required, but the MAS should provide further clarifications in this area.

4.3 We propose to work with the MAS and industry groups to further discuss and work on these proposals.

INTRODUCTION

4.4 The MAS has proposed the introduction of matching adjustment ("MA") for life insurance liabilities subject to meeting some criteria. MA will be added to the risk free discount rate for the calculation of life insurance liabilities. The proposed criteria are as follows:

- Only SGD and USD denominated government bonds and corporate bonds, and cash are eligible
- The eligible assets should have only fixed cash-flows (in terms of timing and currency) and no issuer options (such as call or put options). To ensure the ongoing eligibility of the bond portfolio supporting the MA, bonds with credit rating from BBB- to BBB+ will be limited to 30% of the total eligible assets
- Eligible assets are to be explicitly identified and managed separately from the other assets in the Insurance fund
- Products with immaterial insurance risk will be eligible for MA. Immateriality will be evaluated based on tests which measure the change in the best estimate liabilities after applying specified insurance shocks on mortality, lapse, disability, dread disease and other insured events. In order for the product to be eligible for the MA, the resulting total increase in best estimate liabilities from the shocks must not be more than 20%
- The cash flows from the eligible assets identified above are required to adequately match the liability cash flows (best estimate liabilities, net of reinsurance and including the regulatory PAD) in each future year of projection. A maximum cash flow shortfall of 15% in aggregate is allowed

4.5 In this paper, we set out views on the underlying principle of illiquidity in insurance business, reasonableness of applying MA and appropriateness of criteria mentioned above.

DEFINITION OF ILLIQUIDITY

4.6 Illiquidity in the insurance industry can be considered in different perspectives and we are of the view that the matching adjustment proposal should consider these. In particular:

- Insurance liabilities are generally illiquid except for products where lapses and surrenders are expected to be high. In other words, this is related to the predictability of liability cashflows and whether they are known in advance with sufficient certainty.
- Investment strategy adopted by insurance companies is generally a mixture of buying illiquid and liquid assets. This represents the fact that although for some products where



assets cashflows do not closely match the liability cashflows, these assets are not traded frequently and are typically held to maturity.

Therefore, illiquidity should be considered from the perspective of both assets and liabilities.

- 4.7 Considering the above perspectives on illiquidity in respect of the MAS proposals, we note that the proposals do not take into account the fact that assets will typically be held to maturity or not traded frequently. As a result, we believe there should be some partial recognition of illiquidity in respect of all insurance products. This partial recognition should be available to all insurers.
- 4.8 Insurers who are able to demonstrate that a better asset liability matching can be achieved should be able to receive the matching adjustment.

Recommendation 1

Consider partial recognition of illiquidity in the insurance business available to all insurers. In addition to this partial recognition, matching adjustment will be available to insurers who are able to demonstrate better asset and liability matching.

VOLATILITY ADJUSTMENT

- 4.9 Recent legislation on Solvency II includes an allowance for the partial recognition of illiquidity in the form of volatility adjustment (“VA”). VA was also designed to reduce the volatility in balance sheet by increasing the discount rate for liability to reflect that insurance companies typically hold a certain proportion of illiquid assets.
- 4.10 We propose a similar allowance for the illiquidity in the RBC 2 proposals. Key proposed characteristics of VA include:
- VA will be applicable to all insurance liabilities and will be available to all insurance companies
 - VA calculation will be based on a reference portfolio which represents a typical portfolio held by insurance companies
 - VA calculation will be based on an average spread for the assets included in the reference portfolio
 - There will not be any need for ring-fencing or separate management of assets and liabilities
 - Impact of VA will be an on balance sheet item and will be subject to a symmetric bi-directional credit spread stress (an increase and decrease in credit spreads) to avoid any cherry picking by insurers
 - Application of VA will be a default adjustment. If an insurance company chooses not to apply VA, it will not be apply VA in later periods unless it can justify to the MAS due to any change in its investment strategy.
- 4.11 The reason for proposing a bi-directional shock is to ensure that insurers who do not hold a significant proportion of illiquid assets would not cherry-pick the use of VA even when it is not reasonable to use VA from economic perspective.
- 4.12 Allowance for VA will help the insurers in managing the volatility on the balance sheet.



Recommendation 2

Allow a volatility adjustment in the calculation of liabilities for all types of insurance products. The level of VA will be derived based on a reference portfolio and average spreads determined by the MAS.

We propose to work with the MAS to further refine the calculation and application of volatility adjustment.

MATCHING ADJUSTMENT

4.13 We welcome the introduction of matching adjustment. We have considered proposed threshold criteria in detail and have set our views below.

- **Availability of eligible assets and cashflow matching:** According to the ADB, the total outstanding SGD dominated corporate bonds in Singapore market stand at S\$116b as of Dec 2013, of which only about 10% is above 10 years (i.e. about S\$10b). This amount is no sufficient to meet the cash flow needs of the industry (based on our rough estimate). In fact, more than 50% of the corporate bonds are less than or equal to 5 years. We should also take into consideration that insurers are not the only investors of those bonds. Therefore, we expect significant challenges in meeting the cashflow matching criterion in the current market conditions.
- **Insurance risk criterion (20% threshold):** Our initial finding shows that generally shorter term liabilities are able to satisfy the 20% criteria.

Long term products such as whole life product are not expected to meet the criteria, but it will depend on the outstanding duration of the policies and certain older tranches of these portfolios may actually meet the criteria. Depending on the outcome of the QIS1, we propose to work with the MAS to refine this criterion.

- **Fixed cashflow at the asset level:** The current MAS proposals mention that the asset cashflows should be fixed at the asset level. In our view, since the insurance companies typically manage the insurance funds at the portfolio level, we recommend fixed nature of the asset cashflows should be tested at the product portfolio level.
- **Use of derivatives:** Flexibility should be given to improve asset liability matching (i.e. assets replacement for better hedging, assets replacement from different counterparties over credit risk concern). The allowance of vanilla derivatives such interest rate forwards or interest rate swaptions should help insurers in meeting the MA criteria effectively. Cross currency swap should be allowed into the portfolio for broaden the universe of eligible assets. The allowance of derivatives will be closely linked with the calculation of C2 risk charge or derivatives and we propose to work with the MAS in this area.
- **Separate management of assets and liabilities:** The MAS should clarify the operational aspects of the requirement for the separate management of assets and liabilities. In particular, the MAS should clarify to what extent the earmarking of assets need to be carried out.



Recommendation 3

Work with the MAS to further test the MA criteria and refine these.

In particular, we recommend that the application of the matching adjustment should be principle based. We propose that the MAS define the range in which the criteria should be satisfied. The MAS may want to further refer to the existing Fair Value Hedge framework for a principle based application.

VALUATION INTEREST

- 4.14 In this section, we have briefly touched upon the calculation of the risk free rates. We believe that further work needs to be carried out in these respects due to time constraint; we propose to work with the MAS to refine the calculation once the QIS results have been analysed. In particular, we would like to work with the MAS in the following areas:
- Extrapolation of risk free rate
 - Definition of the last illiquid point
 - Use of market yields and its related impact on volatility
- 4.15 In the consultation paper, it is mentioned that given the 5 years from RBC implementation date, the market of the 30-years SGS will likely have built up. While the majority are supportive of the eventually removal of the LTRFDR, some take the view that the asset built up has to be measured against the built up of the liabilities in 5 years' time.
- 4.16 Liquidity will only improve (from current) if the increase in issuance out-pace the built of liability. In the life insurance market, there is now a growing trend towards retirement planning, with a few product offerings in the market. We would expect that this trend to continue. Noting this trend, the issuance of long dated bonds has to take a quicker pace to increase liquidity. We are of the view that gradual phasing of LTRFDR can commence after clarity of liquidity is sought.

Recommendation 4

Work with the MAS to further refine the calculations of the risk free rate.

In particular, the rules around the gradual phase out of the LTRFDR can be considered once there is clarity on how liquidity will be built up.



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

1. The Monetary Authority of Singapore (“MAS”) issued the second Consultation Paper on 26 March 2014 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 up² at the request from the Council of the Singapore Actuarial Society (“the Society”) to present comments and recommendations to the MAS on the RBC 2 Review Consultation Paper. The recommendations and actions proposed by the Taskforce shall be governed 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 4 sub-groups from the Society’s practice committees (Life Insurance, General Insurance, Health 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 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.

² A similar Taskforce was set up in June 2012 to respond to the first RBC 2 Consultation Paper issued by MAS on 22 June 2012. The Taskforce has provided a report on the consolidated comments of the RBC 2 Review in August 2012. The report can be found in the following link: <http://actuaries.org.sg/?q=node/4361>



Appendix 2 – Taskforce Members

1. Raymond Cheung (Taskforce Chairman, Hon. Secretary and Head of ERM Committee)
2. Cheung Kwok Kei (Head of Life Insurance Committee)
3. William Liang (Representative of General Insurance Committee)
4. Yin Lawn (Representative of Health Insurance Committee)
5. Esther Huang
6. Joey Zhou
7. Matthew Maguire
8. Alex Lee
9. Darshan Singh
10. Jess Kang
11. Maple Lam
12. Richard Holloway
13. Chi Cheng Hock
14. Bruno Pinson
15. Frederic Weber
16. Julien Parasie
17. Zhu Yan

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3. Members of the General Insurance Committee
4. Members of the Health Insurance Committee
5. Members of the ERM Committee
6. Other members of the Society who have contributed in the Consultation Response



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