CONSULTATION PAPER

P003 - 2014

March 2014

Review on Risk-Based Capital Framework for Insurers in Singapore ("RBC 2 Review") - Second Consultation

Monetary Authority of Singapore

PREFACE

The Risk-Based Capital ("RBC") framework for insurance companies was first introduced in Singapore in 2004. It adopts a risk-focused approach to assessing capital adequacy and seeks to reflect the relevant risks that insurance companies face. While the RBC framework has served its purpose well thus far, there is a need to enhance the framework to improve the comprehensiveness of the risk coverage and the risk sensitivity of the framework. This is particularly pertinent in light of evolving market practices and global regulatory developments.

2 This consultation paper sets out more specific proposals, following the first consultation of the roadmap for MAS' review of the RBC framework ('RBC 2 review") in June 2012. The consultation paper also contains the detailed technical specifications which will allow insurers to conduct a full scope Quantitative Impact Study ("QIS") to fully understand the impact of RBC 2.

3 MAS invites interested parties to provide their views and comments on the proposed RBC 2 consultation. Written comments should be submitted by 30 June 2014 to:

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4 Please note that all submissions received may be made public unless confidentiality is specifically requested for the whole or part of the submission.

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1 BACKGROUND

1.1 The RBC framework for insurance companies was first introduced in Singapore in 2004. It adopts a risk-focused approach to assessing capital adequacy and seeks to reflect the relevant risks that insurance companies face. The minimum capital prescribed under the framework serves as a buffer to absorb losses. The RBC framework also provides clearer information on the financial strength of insurers and facilitates early and effective intervention by MAS, where necessary.

1.2 Whilst the RBC framework has served us well, MAS has embarked on a review ("RBC 2") of the framework in light of evolving market practices and global regulatory developments. The review takes into account the revised Insurance Core Principles and Standards issued by the International Association of Insurance Supervisors in 2011.

1.3 As the current risk-focused approach to capital adequacy continues to be appropriate and relevant in the supervision of insurers, MAS will not be making a significant overhaul to the current RBC framework under RBC 2. Instead, any enhancements are aimed at improving the comprehensiveness of risk coverage and the risk sensitivity of the framework, as well as defining more specifically MAS' supervisory approach with respect to the solvency intervention levels.

1.4 A consultation paper ("first consultation") on the roadmap of the RBC 2 Review was issued in June 2012. This second consultation paper revisits some of the earlier proposals in light of the feedback received and the subsequent discussions with the industry. It also covers a number of new proposals, particularly in the areas of calibration of required capital, alignment of available capital components with those in MAS' capital adequacy framework for banks, and introduction of a matching adjustment for life business. This consultation paper also contains detailed technical specifications which will allow insurers to conduct a full scope Quantitative Impact Study ("QIS") to fully understand the impact of RBC 2.

1.5 Section 2 reiterates the first consultation proposal on having two explicit solvency intervention levels, the Prescribed Capital Requirement as well as the Minimum Capital Requirement. This provides greater clarity to insurers on MAS' expectations on the type of corrective capital actions, and the urgency which these actions should be taken, when either of these levels is crossed.

1.6 Section 3 revisits the first consultation proposals on the discounting approach for policy liabilities, and introduces the concept of a matching adjustment for life business. MAS recognises that for predictable liability cash flows, the fixed income assets used to back the policy liabilities are more likely to be held to maturity and therefore do not face the risk posed by short-term interest rate movements. As such,

a matching adjustment will be added to the risk-free discount rates used for these liabilities.

1.7 Section 4 of the paper sets out in more detail the proposed review of the required capital. This covers new proposals relating to reorganisation of risk modules, risk calibration, and allowance for diversification benefits.

1.8 Section 5 covers further proposals to better align, wherever appropriate, the components of available capital with those in MAS' capital adequacy framework for banks. It also sets out a proposal on the amount of negative reserves which may be recognised for solvency purposes under RBC 2.

1.9 Section 6 details proposals on the capital treatment of the offshore insurance fund ("OIF") for all reinsurers under RBC 2. Licensed reinsurers are currently subject to either a simplified solvency regime (in the case of locally incorporated reinsurers) or exempted from any capital or solvency requirements altogether (in the case of reinsurance branches).

1.10 Section 7 sets out more information on the first QIS (also referred to as "QIS 1") on the impact of the RBC 2 proposals. The detailed technical specifications can be found in Annex D. MAS expects to conduct another round of QIS in 2014, with a view to finalising the details by the end of 2014.

1.11 Section 8 outlines the implementation timeline and transitional provisions of RBC 2. Given that the proposals are more comprehensive and detailed than in the first consultation, industry respondents are encouraged to examine their own systems and processes and highlight any implementation issues.

1.12 MAS will continue to engage the industry closely on the RBC 2 review. There will be ample opportunities for industry to provide their feedback through quantitative impact studies and the consultation process.

2 SOLVENCY INTERVENTION LEVELS

2.1 Currently, under the Insurance (Valuation and Capital) Regulations 2004, licensed insurers have to maintain a minimum Capital Adequacy Ratio ("CAR") of 100% at the company level. Insurers are also required to notify MAS about the occurrence or potential occurrence of any event ("financial resources warning event") that would result in the financial resources of the insurer being less than 120%. In practice, we would expect insurers to have capital management plans in place and hold a target CAR of more than 120%. In fact, all insurers generally hold CAR of at least 150%. At the insurance fund level, insurers are currently required to maintain a Fund Solvency Ratio ("FSR") of 100%. Again, in practice, most insurers hold a comfortable buffer in excess of this minimum level.

2.2 In the first consultation, MAS proposed setting two transparent triggers for supervisory intervention when assessing the capital adequacy of an insurer, at both the company as well as insurance fund level:

a) Prescribed Capital Requirement ("PCR"), which is the higher supervisory intervention level at which the insurer is required to hold sufficient financial resources to meet the total risk requirements which correspond to a Value at Risk ("VaR") of 99.5%[1] confidence level over a one-year period;

b) Minimum Capital Requirement ("MCR"), which is the lower supervisory intervention level at which the insurer is required to hold sufficient financial resources to meet the total risk requirements which correspond to a VaR of 90%[2] confidence level over a one-year period.

2.3 The above proposals, which are in line with international standards[3] and other reputable regulators' practices, provide greater clarity to insurers on MAS' expectations on the type of corrective capital actions required, and the urgency which they should be taken, when either of these levels is crossed.

Insurance Fund vs Company Level

2.4 Whilst most respondents supported the proposals, a number felt that it would suffice to apply PCR and MCR at the company level only, and not at the insurance fund level. These respondents were concerned that without any allowance for

[1] As mentioned in the first consultation paper, the 99.5% confidence level corresponds to an implied credit rating of at least an investment grade, and many insurance regulators of major jurisdictions have targeted this level in setting their regulatory capital requirements.

[2] Which corresponds to an implied credit rating of B- and represents a 1 in 10 year event.

[3] As set out in International Association of Insurance Supervisors ("IAIS") Insurance Core Principle 17 on Capital Adequacy.

diversification benefits (as proposed in the first consultation), applying the PCR and MCR at the fund level would effectively result in a higher confidence level at the company level than that targeted. For example, given that each insurance fund already needs to meet the PCR level of 99.5% confidence level, it is very likely that the PCR at the company level would exceed 99.5% confidence level in the absence of diversification benefits.

2.5 MAS considers it prudent to impose capital requirements at both the insurance fund and company levels. The fund solvency requirements help to ensure that for each insurance fund, there are sufficient financial resources to cover the total risk requirements at a 99.5% confidence level. The capital adequacy requirements at the company level, on the other hand, help to ensure that there are also sufficient financial resources to cover the total risk requirements for the shareholders' fund[4].

2.6 Given that MAS is now proposing to allow some form of diversification benefits within and between insurance funds, it is unlikely that the sum of the fund level PCRs will exceed the company level PCR which is targeted at VaR (99.5%). As such, under RBC 2, MAS will be adopting the two supervisory intervention levels, PCR and MCR, at both the company as well as at an insurance fund level.

Prescribed Capital Requirement

2.7 As set out in the first consultation, if an insurer's capital falls below its PCR, the insurer will need to submit to MAS a plan to restore its capital position within 3 months. 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 exceptional market stresses. This is different from the current RBC framework where insurers would be deemed to have breached the regulatory requirement when the CAR or FSR fall below 100%. In such a circumstance, insurers would be expected to inject capital almost immediately.

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.

2.8 MAS can require an insurer to maintain financial resources above the PCR should there be other supervisory concerns. MAS will consult at a later stage on when such additional requirements would be deemed necessary. One example may

[4] For example, shareholders' fund assets would attract asset risk requirements, and if the insurer has branches that write insurance business, liability risk requirements of the branch business would also apply.

be where differences between the insurer's risk profile and the industry's risk profile result in the standardised formula approach being inadequate.

Minimum Capital Requirement

2.9 As set out in the first consultation, MAS will take its strongest enforcement actions if the MCR is breached. Such actions include stopping new business, withdrawal of licence, or directing a transfer of portfolio to another insurer. The MCR will be calibrated as a fixed percentage of the PCR for ease of computation and future monitoring. MAS will be proposing a simplified formula for consultation at a later stage, based on the results of QIS 1.

3 VALUATION OF ASSETS AND LIABILITIES

3.1 An insurer needs to determine the value of its assets and liabilities before computing its solvency requirements. Valuation rules for the RBC framework are specified within the Insurance (Valuation and Capital) Regulation 2004 and the relevant Notices.

3.2 Under current valuation rules, assets are to be valued at the market value, or the net realisable value, in the absence of market value. Policy liabilities are to be valued based on best estimate assumptions, with provision for adverse deviation ("PAD") (commonly known as a risk margin). Policy liabilities for life insurance are computed using a prospective discounted cash flow method while those for general insurance consist of the premium liabilities and the claims liabilities.

3.3 In the first consultation, MAS posed a consultation question as to whether the cost-of-capital approach was appropriate for computing PAD for both life and general insurance liabilities, and the appropriate cost-of-capital rate to be used for this approach.

3.4 A number of the respondents were of the view that the current methodology of deriving PAD works well and that we should remain status quo until there is more clarity on international practices such as the accounting standards. Some felt that the cost-of-capital approach was overly complex, whilst a few felt that the current methodology had the merit of allowing actuaries to apply their professional judgment. Most respondents agreed that more analysis on the suitability of the cost-of-capital approach should be done, and that further industry study may be necessary to determine an appropriate cost-of-capital rate.

3.5 Compared to the other RBC 2 proposals, there is less impetus to make changes to the PAD methodology. Hence MAS will not be adopting the cost-of-capital approach for deriving the PAD. Insurers may however need to update the current methodology based on the proposed changes to the insurance risk (Component 1 requirement) calibration, if applicable. MAS will continue to monitor the developments at the international front and review the PAD methodology at a suitable juncture in future.

3.6 Therefore, the only changes that MAS is proposing to the valuation framework for solvency purposes are the discounting approaches for policy liabilities as well as the introduction of a matching adjustment.

Discounting Approach for Policy Liabilities

Singapore dollar ("SGD") denominated liabilities

3.7 Life insurers are currently required to calculate their policy liabilities using a prospective discounted cash flow method, with MAS Notice 319 prescribing the use of the risk-free discount rate to determine the value of policy liabilities for non-participating policies, non-unit reserves of investment-linked policies, and the minimum condition liability of participating funds.

3.8 For SGD denominated liabilities, the risk free discount rate is:

a) where the duration of a liability is X years or less, the market yield of the Singapore Government Securities ("SGS") of a matching duration as at valuation date;

b) where the duration of a liability is more than X years but less than Y years, a yield that is interpolated from the market yield of the X year SGS and a stable long term risk free discount rate ("LTRFDR"); and

c) where the duration of a liability is Y years or more, a stable LTRFDR.

3.9 The stable LTRFDR is to be calculated according to the following:

a) compute the average daily closing yield of the X-year SGS since its inception;

b) compute the average daily yield differential between the X-year and Y-year SGS since the inception of the Y-year SGS;

c) derive an estimate long-term yield by summing the values obtained under subparagraphs (a) and (b);

d) compute the prevailing average daily closing yield of the Y-year SGS over the past 6-month period;

e) allocate 90% weight to the estimated long-term yield obtained in subparagraph (c), and 10% to the prevailing average yield under subparagraph (d).

f) The LTRFDR is then obtained by summing the two values in (e).

Currently, X and Y are 15 and 20 respectively.

3.10 In the first consultation, MAS invited views on the following two approaches with regard to the risk-free discount rate for SGD denominated liabilities:

a) First approach - To keep to the same LTRFDR formula as set out in paragraph 3.9, 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; and

b) Second approach - To remove the LTRFDR formula altogether, that is, for durations up to 30 years, the prevailing yields of SGS will be used. For durations of 30 years and above, the yield will be kept flat at the prevailing yield of 30-year SGS.

3.11 There were mixed responses received on the proposed two approaches. Under the first approach, the discount rate is less volatile and more stable for the valuation of policy liabilities. The respondents who supported the first approach did not think there was sufficient liquidity for the recently introduced 30-year SGS and minor trades might result in big swings in the market yield used to value liabilities. Furthermore, to close the duration mismatch gap, insurers might be forced to compete for the limited supply of long duration assets, resulting in a further depression of yields. This might inadvertently translate to higher cost of insurance that would be passed on to consumers. On the other hand, some respondents preferred the second approach as it was in theory, more market consistent. Several respondents proposed that the second approach be adopted only when the supply and liquidity of long-term SGS have been built up.

3.12 In view of the consultation feedback, MAS proposes to phase out the LTRFDR gradually. Over the next 5 years from the RBC 2 implementation date, the market for the 30-year SGS will likely have built up. The gradual move towards using mark-to-market yield for durations 30 years and above will also minimise the risk of sudden shifts in insurers' asset allocations that could cause market disruption.

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[5]:

Year 1: 90%/10%

Year 2: 70%/30%

Year 3: 50%/50%

[5] The weights A%/B% shown are where A% is applied on the existing LTRFDR and B% is applied on the yield of the 30-year SGS.

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.

More details and instructions can be found in the QIS 1 technical specifications.

3.13 It is currently provided in MAS 319 that where an insurer implements an effective cash flow hedge or fair value hedge as defined under FRS 39 of the Accounting Standard, the insurer may elect to use the market yield of the SGS of a matching duration as at the valuation date for valuing such hedged Singapore dollar policy liabilities. For the hedged policy liabilities that have a duration exceeding the maximum duration available on the SGS yield curve, the market yield for the maximum duration SGS available shall be used. Where an insurer has elected to use the market yield of the SGS of a matching duration, it shall continue to do so as long as the designated liabilities remain a hedged liability as defined under FRS 39. MAS may at any time require the insurer to produce all necessary documentary evidence on the hedging of such policy liabilities within such time as may be specified by MAS. As mentioned in the first consultation, MAS will be retaining this flexibility under RBC 2, up to the end of the 5 year transition period mentioned in Proposal 1. At the end of the 5 year period, the market yield of the full SGS yield curve will be used for discounting liabilities, and as such, this provision will no longer be necessary.

Non-SGD denominated liabilities

3.14 MAS 319 currently states that the risk-free discount rate to be used for non-SGD denominated liabilities is the market yield of the foreign government securities of similar duration at the valuation date. MAS proposed in the first consultation that, for such non-SGD denominated liabilities, insurers follow the regulatory requirements pertaining to discounting in the jurisdiction issuing the currency[6]. The rationale was

[6] For example, for US-dollar denominated liabilities, the insurer will discount its liabilities according to the discounting requirements set by the National Association of Insurance Supervisors ("NAIC") in US. For liabilities denominated in currencies of European Economic Area member states, the insurer will

that the insurance regulator in the jurisdiction issuing the currency would be best placed to set the discount rate for its home currency.

3.15 Most respondents commented that the proposal was overly complex and cumbersome to implement. In addition, insurers would have to understand the foreign regulatory regimes and be apprised of any updates in these regimes. The proposal might also lead to inconsistencies in the valuation as some regimes might still be on a net premium valuation basis and the prescribed discount rates might not make sense.

3.16 Some of the alternatives suggested included maintaining the current methodology, allowing actuaries to exercise their professional judgment to determine the appropriate basis with which to discount the policy liabilities, or incorporating a materiality threshold such that a simplified approach could be used for immaterial amounts and discount rates could be specified by MAS for material amounts.

3.17 In view of the consultation feedback, MAS proposes to work with the industry to develop prescribed discount rates for specific jurisdictions, with a view that the tables be updated by the industry on a regular basis.

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.

General insurance policy liabilities

3.18 MAS 319 is currently applicable to insurers writing life business only. For general business, Guidelines ID 01/04 provide that discounting of liabilities should be carried out where the impact of such discounting is material. Where discounting is carried out, the discount rate should be the gross redemption yield as at the valuation date of a portfolio of government bonds (where applicable) with a currency and expected payment profile (or duration) similar to the insurance liabilities being

discount its liabilities according to the discounting requirements set by the European Commission under Solvency II.

valued. In the first consultation, MAS proposed to extend the discounting requirements for life business to general business as well, for liability durations of above one year. For liability duration of one year and less, no discounting would be required.

3.19 Most respondents preferred to maintain the current practice of discounting the general insurance policy liabilities where the impact of discounting was deemed to be material. Some respondents suggested that insurers be given the option to apply for exemption from discounting if the impact of discounting was immaterial.

3.20 Not discounting the general insurance liabilities is generally a more conservative approach. Given this and the feedback received, MAS now proposes that no discounting be required for liability durations of above one year, if the impact of such discounting is not material. As for liability durations of one year or less, discounting will not be necessary. For avoidance of doubt, where discounting is carried out, the discounting approach will be the same as for life business, for both SGD- and non-SGD denominated liabilities.

Introduction of Matching Adjustment

3.21 In the first consultation, MAS sought feedback on whether we should allow some illiquidity premium adjustment in the risk-free discount rate for valuing certain portfolios such as annuities. This was because for certain types of insurance products such as annuities, the insurer would typically hold the assets (which back the liabilities of those products) to maturity, and would not be exposed to market risk (i.e. spread risk) but rather default risk, since the insurer need not sell the assets until they mature.

3.22 Many of the respondents were of the view that the inclusion of some illiquidity premium adjustment would be reasonable. However, several respondents commented that the illiquidity premium adjustment should not be restricted to annuity business only, but made available to long-term life insurance portfolios with cash flows which could be projected with a high degree of certainty. The Life Insurance Association of Singapore submitted a detailed proposal to use swap rates (instead of SGS yield) plus a spread to allow for illiquidity premium consistent with the spread on some reference illiquidity asset portfolio.

<u>Rationale for Introducing Matching Adjustment</u>

3.23 Insurers are exposed to short-term volatility in bond prices when they need to sell bonds at unexpected times, for example to meet unanticipated liability cash flows. For insurers with more predictable future liability cash flows, the bonds used to back these liabilities are more likely to be held to maturity and therefore should not be

affected by short-term market volatility. Nevertheless, insurers which hold bonds to maturity are still exposed to the risk of default and downgrade of the bonds.

3.24 Only a few jurisdictions[7] have introduced or are considering an illiquidity premium or matching adjustment in their insurance solvency frameworks. The following table sets out the main features of the two approaches .

Feature	Matching Adjustment	Illiquidity Premium
How it works	Insurers to first identify a portfolio of predictable liabilities and matching portfolio of high quality bonds that must be ring-fenced. The portion of spread movement from the ring-fenced assets that is not related to default or downgrade, the "matching adjustment" is added to the discount rate used to value the liabilities	An adjustment is made to the valuation discount rate for liabilities to account for the illiquid nature of certain types of insurance liabilities. This is in line with the fair value principle for valuation of illiquid assets. An example would be taking the illiquidity premium as a percentage of the spread of corporate bonds of a certain rating.
Scope	All insurance business meeting the criteria	All insurance business meeting the criteria
Supervisory approval	Yes	No
Specific features	Strict criteria on eligible assets and liabilities	Strict criteria on eligible products
Activation	Permanent, predictable and automatic	Permanent, predictable and automatic
Strengths	• Encourages insurers to maintain their long-term investment horizon for qualifying products • Reflects actual assets held and their matching characteristics to the liabilities •Highly responsive to spreads	• Encourage companies to maintain their traditional long term products • Simpler calculation • Partially responsive to spreads
Weaknesses	• More complex calculations •Restrictive nature means that only certain products will qualify	• May not take into account actual assets held which is of particular relevance at times of stress • May not promote good ALM as companies receive illiquidity premium regardless of matching position

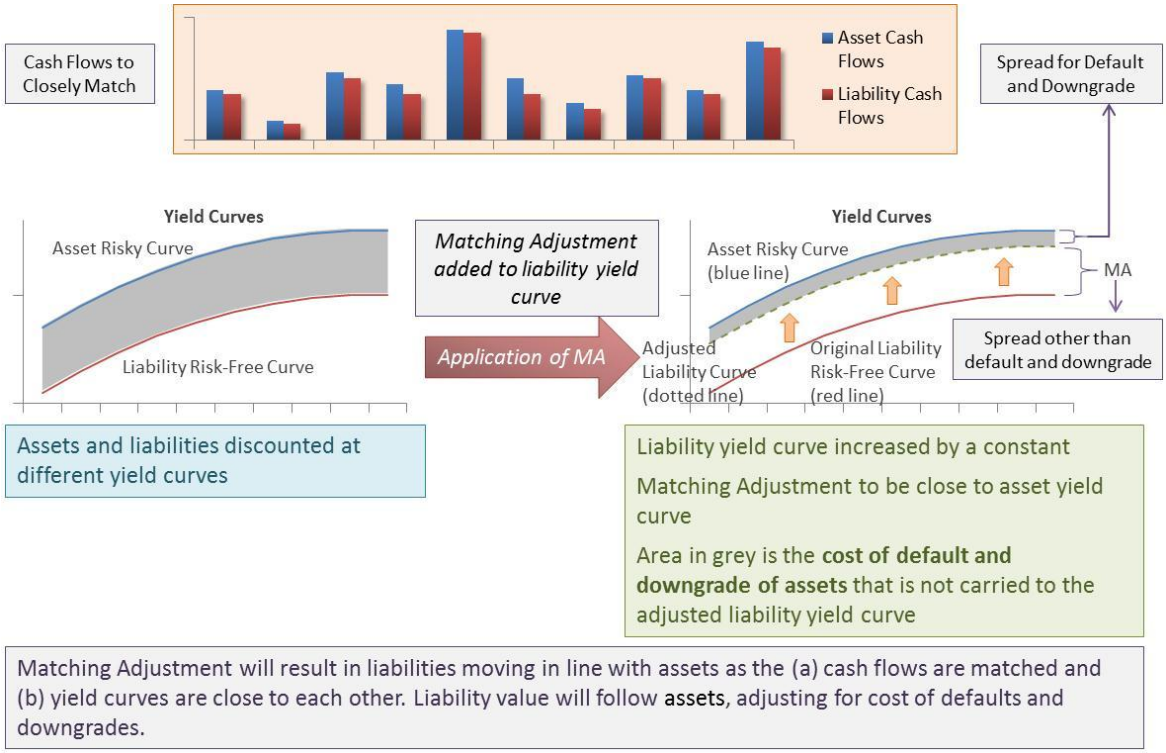
3.25 MAS intends to introduce a matching adjustment ("MA") mechanism. While more complex in working compared to the illiquidity premium option, MA makes reference to the actual assets held by insurers, resulting in less basis risk and is more responsive to credit spread movements. It also allows MAS to customise the features and eligibility criteria to suit the local market better. MA will also allow insurers which can demonstrate satisfactory asset liability management ("ALM") practices and commitment to hold bonds to maturity to be largely immunised from credit spread movements. As MA is still a very new concept amongst the insurance jurisdictions, MAS welcomes any feedback on how to refine the proposals further. MAS also intends to consult on the governance requirements at a later stage.

How Matching Adjustment Works

3.26 The MA is a parallel upward adjustment applied to the risk free discount rate used in valuing eligible policy liabilities. The MA is derived from the portfolio of bonds that are backing the eligible policy liabilities, and is equal to the spread of the bond

[7] For example, APRA and EIOPA (Solvency II).

yields over the risk-free rate, less an estimated spread[8] for the cost of default and downgrade. This effectively allows policy liabilities to mirror closely the market changes in the bond values that are not related to defaults or downgrades. The next diagram illustrates how the MA works.



Determination of the Spread for Default and Downgrade

3.27 In order to derive the MA, it is necessary to determine the spread for default and downgrade, which represents the cost of default (i.e. risk of the bond defaulting) and cost of downgrade (i.e. risk of the bond being downgraded such that it would no longer meet the eligibility criteria described in later sections). The spread for default and downgrade, both expressed in annual basis points, comprises the following components:

- **Cost of default** – Interpreted as the portion of the credit spread required by investors for taking the risk of default of a bond. The expectation of a default is based on historical transition matrices combined with an assumption on the loss given default, which is assumed to be 30%[9]. As the cost of default should reflect defaults during times of stress, MAS proposes to use a long-

[8] These risks are specific to assets and therefore should not be applied to the discount rate for liabilities.

[9] Based on an S&P study, the nominal recovery rate ranges from 70% for senior secured bonds to 35% for senior unsecured bonds. This would mean a loss given default starting from 30%. We have assumed 30% based on the quality of the bonds which insurers hold. EIOPA has also proposed 30% for its MA proposal.

term default rate. Given that this long-term default rate is a best estimate of the future default rates, we will apply a loading to account for the volatility from the mean for prudence;

- **Cost of downgrade** – This is based on the probability of the bond being downgraded and the cost in case of downgrade. In the MA framework, the eligible assets will be required to have an investment grade credit rating. In the event of a downgrade to below investment grade, insurers will therefore incur a cost to maintain the credit rating of the assets under the MA. The probability of being downgraded is taken from historical transition matrices. The cost of downgrade is based on the observation of long-term average market spreads for different durations and credit ratings. This calculation considers the cost of downgrade for the entire duration of the bond. It is assumed that the insurer will replace the downgraded bond with a bond of the same credit rating as the downgraded bond at the beginning of the year.

3.28 As a safeguard, the total basis point spread related to the cost of default and the cost of downgrade above will be increased by a factor to account for basis risk that may arise from differences between the data used to calculate the MA and the actual profile of the assets held by insurers. Also, the spread for default and downgrade is expected to vary by outstanding maturity and credit rating. However, due to the non-availability of public data on credit spreads for SGD corporate bonds, it is proposed that a common set of components of the spread for default and downgrade be used for both SGD and USD corporate bonds.

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?

Criteria to be Met in Order to Apply MA

3.29 The MA is premised on the principle that where suitable high quality assets can be held to closely match predictable liability cash flows, the value of such liabilities can be allowed to mirror the changes in asset values that are not related to cost of default or downgrade. As such, the MA will only be applicable to a portfolio of matched assets and liabilities that meet the conditions specified in Annex A.

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.

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.

4 COMPONENTS OF REQUIRED CAPITAL

Introduction and Reorganisation of Risk Modules

4.1 The RBC framework requires insurers to hold capital ("Total Risk Requirements or TRR") against their risk exposures. The TRR comprises 3 components:

- Component 1 (C1) requirement relates to insurance risks undertaken by insurers. C1 requirement for general business is determined by applying specific risk charges on an insurer's premium and claims liabilities. Risk charges applicable to different business lines vary with the volatility of the underlying business. The requirement for life business is calculated by applying specific risk loadings to key parameters affecting policy liabilities such as mortality, morbidity, expenses and policy termination rates;

- Component 2 (C2) requirement relates to risks inherent in an insurer's asset portfolio, such as market risk and credit risk. It is calculated based on an insurer's exposure to various markets including equity, debt, property and foreign exchange. The C2 requirement also captures the extent of asset-liability mismatch present in an insurer's portfolio;

- Component 3 (C3) requirement relates to asset concentration risks in certain types of assets, counterparties or groups of counterparties. C3 charges are computed based on an insurer's exposure in excess of the concentration limits as prescribed under the Insurance (Valuation and Capital) Regulations 2004.

4.2 MAS proposes to keep the above broad classification under RBC 2, but with some changes to improve clarity and transparency:

- Introduction of new risks (i.e. insurance catastrophe risk requirement and operational risk requirements);

- Reclassification of debt investment and duration mismatch risk requirement to interest rate mismatch risk requirement and credit spread risk requirement;

- Streamlining of loan investment risk requirement, derivative counterparty risk requirement, miscellaneous risk requirement to counterparty default risk requirement;

- Separation of the C1 life insurance policy liability risk requirement to the various components (e.g. mortality (non-annuity) risk requirement, dread disease risk requirement, lapse risk requirement etc).

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.

4.3 MAS will not be imposing an explicit risk charge for liquidity risk. MAS has already conducted a pilot study on liquidity stress testing with the life insurers, and will be consulting on incorporating the liquidity stress testing as part of the annual industry-wide stress test exercise in the later part of this year. Meanwhile, MAS will continue to assess the robustness of insurers' liquidity risk management through supervision.

Target Criteria for Calibration of Risk Requirements

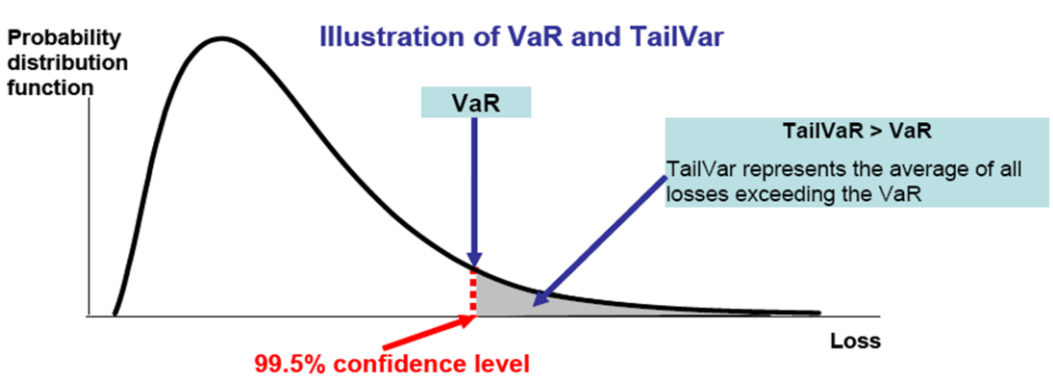
4.4 In the first consultation, MAS proposed to recalibrate risk requirements using the VaR measure of 99.5% confidence level over a one year period.

4.5 There are 2 common risk measures used internationally:

- VaR – this is the expected value of loss at a predefined confidence level (e.g. 99.5%). Thus, if the insurer holds capital equivalent to VaR, it will have

sufficient assets to meet its regulatory liabilities with a confidence level of 99.5% over a one year time horizon; and

- Tail Value at Risk ("tVaR") – this is the expected value of the average loss where it exceeds the predefined confidence level (e.g. 99.5%). It is also known as the conditional tail expectation ("CTE"), expected shortfall or expected tail loss. If an insurer holds capital equivalent to tVAR, it will have sufficient assets to meet the average losses that exceed the predefined confidence level (of say 99.5%).



4.6 The VaR approach, while it has its limitations, is a generally accepted risk measure for financial risk management. It is easier to calibrate the risks under a VaR approach compared to using tVaR. However, VaR, unlike tVaR, tends to underestimate the exposure to tail events.

4.7 On balance, MAS proposed to adopt the VaR measure as it is easier to calibrate[10]. tVaR can be considered under the internal model approach in future, if insurers deem it to be more appropriate for their business or risks. Tail event analysis can also be done during the annual industry wide stress testing exercise or as part of the insurer's own risk and solvency assessment.

4.8 Most respondents agreed with the proposal to recalibrate risk requirements using the VaR measure of 99.5% confidence level over a one year period although one respondent doubted the usefulness of VaR and suggested that the insurer be allowed to decide on the appropriate risk measure for the use of internal models.

4.9 MAS will keep to the original proposal to calibrate the risk factors under the standardised approach using the VaR measure. MAS recognises that tail risks may be underestimated with the use of VaR. However, we intend to rely on industry wide stress tests and the insurer's own risk and solvency assessment ("ORSA") to test the impact of tail events. Further, MAS will have the power to impose additional capital requirements should we find that the standardised approach does not capture the risks of the insurer adequately. Hence, where a particular insurer is shown to be very vulnerable to tail events under the industry wide stress tests and ORSA,

[10] Calibration under tVaR requires information on the full distribution of outcomes, Details of distribution of tail is not typically available and may require subjective assumptions being made.

additional capital requirements may be imposed by MAS. MAS is prepared to consider the use of tVaR[11] under the internal model approach at a later stage, if insurers can demonstrate that tVaR is more reflective of the nature of their risks.

4.10 MAS is guided by the following principles when calibrating the risk requirements:

- The risk requirements are as reflective of the risk profile of the Singapore insurance sector as possible, by making good use of the data collected where available;
- The calibration outputs are reasonable (by checking against other jurisdictions', rating agencies' and insurers' results for broad consistency and comparability);
- The framework does not penalise insurers' investments in long-term assets, which are necessary to match the liability profile;
- The calibration of risk requirements and overall capital framework are not pro-cyclical.

Allowance for Diversification Benefits

4.11 Under the current RBC framework, the total risk requirements are obtained by summing the C1, C2 and C3 requirements. Within the C1 or C2 requirement, the underlying risk requirements[12] are also added together, without allowing for any diversification effects with the help of correlation matrices. Some major jurisdictions such as the European Economic Area (under Solvency II), Australia and Bermuda have moved towards allowing for diversification effects when combining various risk modules[13], and even within sub-modules, using prescribed correlation matrices. This has the effect of reducing the overall regulatory capital requirements.

[11] Should tVaR be allowed under internal model in future, the confidence level would be lower (i.e. 99%) to be roughly equivalent to VaR (99.5%), which the standardised approach is calibrated.

[12] For C1 requirement for general business, premium liability and claims liability risk requirements are summed together. In the case of life business, the effects of the loadings on the best estimate assumptions (e.g. mortality, morbidity, lapse, expense, etc) are applied in an additive manner. For C2 requirement, the respective risk requirements are added together, for example, equity, property, debt, asset–liability mismatch, foreign currency mismatch and loan risk requirement.

[13] Examples of risk modules can be life insurance risk, general insurance risk, asset risk and counterparty risk.

Examples of sub-risk modules can be equity risk, property risk, interest rate risk, spread risk and foreign exchange risk within the asset risk module. Or mortality risk, morbidity risk, lapse risk, expense risk and catastrophe risk within the life insurance risk module.

4.12 In the first consultation, MAS proposed not to allow for diversification benefits when aggregating the risk requirements under the RBC 2 framework. However, MAS indicated that diversification benefits could be considered if the industry was able to substantiate, with robust studies and research conducted on the local insurance industry, that there were applicable correlations which could be relied on during normal and stressed times.

4.13 The rationale for MAS' original proposal was that dependencies between different risks would vary as market conditions change and correlation has been shown to increase significantly during periods of stress or when extreme events occur. While several major jurisdictions have allowed for diversification benefits, MAS noted that the level of sophistication of the correlation matrices varied, and the matrices were often based on expert judgment than empirical evidence.

4.14 Many respondents disagreed with the proposal and felt that it was too punitive, especially if other jurisdictions recognised diversification in their capital frameworks. Several respondents argued that it was unusual to assume 100% correlation (i.e. assuming full correlation and no savings from diversification). Without recognition of diversification benefits, the overall capital requirement would effectively be higher than the proposed target level of VaR (99.5%). Respondents were of the view that besides limited dependencies between certain lines of business as well as between product lines (for example, mortality and longevity, life and non-life), diversification benefits might also arise between and within asset classes and across the C1, C2 and C3 risk requirements.

4.15 In view of the consultation feedback and practices in other jurisdictions, MAS now proposes to allow for diversification benefits in the following ways:

- Within C1 requirement for life insurers[14] – An explicit correlation matrix will be prescribed to combine certain, but not all, the underlying risk requirements under C1. We have selected risk requirements where correlation behaviours are more intuitive and expected to be more stable in times of stress[15]. Such examples will be between mortality and longevity[16]

[14] The diversification benefits within C1 requirement for general insurers will be relooked at later, after the development of the insurance catastrophe risk requirement and the recalibration of premium liability and claims liability risk requirements for general business is close to finalisation. Currently, diversification across business lines is already implicitly allowed for in the determination of the PAD for general business.

[15] The pairwise correlation factors between the various C1 risk requirements are more distinct, as compared to that between C2 risks, where evidence has shown that they will similarly converge to one during times of crisis. Besides, the actual business mix between different insurers can also be very distinct, and therefore would be more appropriate to have explicit correlation matrices for insurers to determine the diversification benefit.

[16] Diversification is expected to exist between mortality and longevity risks, as it is evident that an improving mortality will not benefit the annuities type of products and it will not be realistic to assume that both improving and worsening mortality experience can happen at the same time for these products.

(referred to as mortality (annuity)), as well as between dread disease and other insured events (accident and health).[17] This will be further elaborated under Proposal 18;

- Within C2 requirement – we expect the correlation behaviours of the asset risk requirements to be more volatile, and such correlation may not bear out in times of stress. However, given that MAS collects granular data[18] on the insurers' asset exposures regularly, MAS has carried out simulations (further explained in paragraph 4.53) to derive the diversification benefits we would expect to see, since the worst 1-in-200 year event will not occur at the same time for all the various asset risk modules. Therefore, the proposed calibrated C2 risk requirements have already been adjusted downwards to take into account of the diversification benefits across all asset risk types;

- Company level diversification benefit for the interest rate mismatch risk requirement under C2 – Given that interest rates can only move either upwards or downwards at a given point in time, MAS proposes to recognise some diversification between insurance funds [19] (with the exception of the participating fund) at the company level for the interest rate mismatch risk requirement. This is further explained in paragraph 4.75;

- Between C1 requirement and C2 requirement – We will assume that the C1 and C2 requirements are fully independent and not correlated. This is in line with the common understanding that insurance underwriting risks are generally not correlated with the economic cycle and financial market risks.

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;

[17] Diversification is expected to exist between dread disease and other insured events (accident and health) risks, as an increasing rate of dread disease occurrence may lead to higher hospitalisation incidence rates too.

[18] MAS Notice 122 Notice on Asset & Liability Exposures for Insurers

[19] At the insurance fund level, insurers are required to take the maximum loss from the upward or downward interest rate scenarios in determining the interest rate mismatch risk requirement.

- 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:

$$\sqrt{C1^2 + C2^2}$$

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

C1 Requirement for Life Business

Mortality (Non-annuity) Risk Requirement

4.16 Mortality risk is the risk associated with the variability in liability cash flows due to the incidence of death. MAS used the information from the 1997-2002 and 2004-2008 mortality studies on Singapore insured lives, published by the Singapore Actuarial Society ("SAS") to calibrate the mortality shock. Adjustments have been made to the data for consistency in basis between the two studies performed at different time periods. For example, the age definition for the 1997-2002 mortality study has been adjusted from age nearest to age last birthday, to be consistent with the age definition used in the 2004-2008 study.

4.17 The number of claims and exposures for both male and female were combined for each age group. Given the large exposures in each age group over the 10 years (1998-2008), the crude death rates for each year and each age group are assumed to be normally distributed based on the central limit theorem. The VaR (99.5%) shock is then derived from the normal distribution for each age group. The median of all these shocks, over the 10 years, and across the different age bands, is around 25%[20].

[20] Both the Life Insurance Association and Singapore Actuarial Society has recommended using a rolling number of years of Actual/Expected results to allow for random fluctuations. However, it is reasonable to assume that the best estimate assumption will be adjusted the following year to reflect more closely the current year experience. Hence under MAS' proposed calibration methodology, the actual level of changes year-on-year is considered.

4.18 Taking into consideration the calibration results of other insurance jurisdictions[21], and the fact that mortality experience has been relatively stable in Singapore, MAS proposes to adopt a 20% shock to the best estimate mortality assumptions. Under the current RBC framework, a different mortality loading is applied depending on whether the premium rate payable by the policy owner is guaranteed. However, we note that premium rates for mortality risk are typically guaranteed, and such a differentiation is not necessary. MAS has also considered calibrating separate mortality shocks for different genders and smoker status, but did not do so as the data is currently insufficient to support such a granular study.

4.19 MAS notes industry feedback that the standard prescribed mortality table used in deriving the C1 mortality loading for Singapore risks does not accurately represent the underlying rate of mortality experienced by insurers. The mortality table may also be overly simplified as it ignores factors such as smoker status, occupation class or the number of years since the policy was underwritten. Different insurers also have different practices when loading on the prescribed standard table for substandard lives (or lives with medical underwriting). Hence, MAS proposes to remove the reference to a prescribed standard table when determining the mortality risk requirement, and the mortality shock will be applied on the best estimate mortality rates instead under RBC 2.

Proposal 7

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

Proposal 8

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

Mortality (Annuity) Risk Requirement

4.20 Longevity risk is the risk associated with the variability in liability cash flows due to increasing life expectancy. As the amount of annuity business written in Singapore is very small, there is insufficient data to derive the mortality (annuity) shock.

4.21 It is widely recognised that a structural shift in demographics is taking place globally; people are living longer. Insurers may not have explicitly allowed for mortality improvement when setting mortality assumptions. In addition, given the limited information locally, insurers tend to make reference to annuitant tables

[21] In the Ernst and Young study where the Solvency II factors are applied on Singapore data, it is noted that applying a permanent increase of 15% implies a confidence level of between 95% and 99.5%.

developed by other jurisdictions, which may not be an accurate reflection of the insurer's own underlying experience.

4.22 Given that we have less available data on longevity exposures, and that longevity stress is a long term risk and hence subject to more uncertainty, MAS proposes to apply a higher longevity shock than the mortality shock. Gradual changes to inception rates and trends have also been considered, instead of applying a one-off shock. However, this would increase the complexity of the calculations without necessarily improving the accuracy of the results.

4.23 In view of the above, MAS proposes imposing a 25% longevity shock to the best estimate assumptions. We also propose to remove the reference to a prescribed standard table when determining the longevity risk requirements, for the same reasons as mentioned under paragraph 4.19.

Proposal 9

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

Proposal 10

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

Disability Risk Requirement

4.24 Disability risk is the risk associated with the variability in liability cash flows due to the incidence of policyholder's disability claims, as well as recovery or termination rates. The majority of the disability products offered in Singapore provide Total & Permanent Disability ("TPD") benefits. Based on the most recent SAS Mortality Investigation over the period of 2004 to 2008, most of the mortality business has a lump sum TPD accelerator[22] attached. Although the results indicate that the incidence of TPD claims might have increased over the years, the number of TPD claims reported was still low to make any calibration credible. Since it is common for a benefit to be paid on either TPD or death in Singapore (for a packaged product with both death and disability benefits), MAS proposes to apply the same level of shock as the mortality shock.

4.25 It is noted that in several insurance jurisdictions, the disability shocks are differentiated by initial incidence, termination or recovery rates. However, as the disability products offered in Singapore mainly provide lump sum TPD benefit, where the benefits are paid out within a few instalments, it is unnecessary to make a distinction between initial and recovery rates, especially since data is limited.

[22] This means that upon the occurrence of TPD, the payout of the sum assured will be accelerated.

Proposal 11

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

Dread Disease Risk Requirement

4.26 Morbidity risk is the risk associated with the variability in liability cash flows due to the incidence of dread disease claims, as well as recovery or termination rates. Dread disease cover is often offered as an accelerating rider[23] to the basic life insurance policy.

4.27 Claims and exposures information for the accelerating critical illness riders were collected for the most recent SAS Mortality Investigation over the period 2004 to 2008. Similar to the calibration of mortality shocks, the number of claims and exposures for both male and female were combined by age groups. Given the large exposures in each age group over the 5 years, the crude incidence rates for each year and each age group are assumed to be normally distributed based on the central limit theorem. The VaR (99.5%) shock is then derived from the normal distribution for each age group. The median of all these shocks, over the 10 years, and across the different age bands, is around 30%.

4.28 Although an increasing number of claims has been observed over the period, there were also higher take-up rates and changes in crude rates tend to be volatile. Dread disease data tends to lose its relevance quickly over time as policy conditions change or new diseases arise. The industry definition of dread disease has also changed over time, affecting the incidence and severity of claims differently. Hence, a time frame of five years is deemed appropriate for the calibration work.

4.29 MAS also referred to the approaches adopted by other insurance jurisdictions in calibrating dread disease or morbidity shocks. For Solvency II, a 35% shock applies for the next year followed by a 25% shock to the incidence rates thereafter. However, there is also a further 20% reduction in the recovery rates where applicable. For Canada, different levels of shock, up to 50%, apply for the level, trend, volatility and catastrophe risks. As the dread disease products offered in Singapore mainly provide lump sum benefits, it is unnecessary to make a distinction between initial and recovery rates, especially since data is limited.

4.30 The dread disease loading under the current RBC framework varies depending on whether the premium payable by the policy owner is guaranteed for the full duration of the policy. Premium rates for dread disease tend to be reviewable given the greater uncertainty in the experience due to medical advances or new

[23] The rider accelerates the payment of the sum assured of the basic policy upon the occurrence of the dread disease.

diseases that may emerge in the future. Larger margins would therefore be needed if rates are guaranteed. Hence for prudence, MAS proposes to retain the differentiation in dread disease shocks depending on whether the premium payable is guaranteed or not.

4.31 Given the lack of granular information to calibrate this distinction, and that the majority of the policies in the 2004-2008 study are expected to be of non-guaranteed premium rates, 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 assumptions.

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.

Other Insured Events (Accident & Health) Risk Requirement

4.32 Other insured events (accident and health) risk is the risk associated with the variability in liability cash flows due to the incidence of accident and health claims, as well as recovery or termination rates.

4.33 It is a practical challenge to find suitable data to calibrate this risk requirement. There tends to be more variability in the design of accident and health products. More rating factors are also used, for example, smoking status, medical underwriting and occupation class, leading to less homogeneity in the data. Health data should ideally be collected over a longer period of time to build up a sufficient volume, but it also loses its relevance quickly. Health policies tend to be renewable on a yearly basis, and both the premium rates and policy conditions can change year-on-year based on the underlying experience and characteristics of the insured portfolio and external influences.

4.34 In view of the above limitations, MAS proposes to adopt a pragmatic approach and adopt the shocks used for dread disease. This is a logical approach as there is some implicit correlation between the two risk modules. For example, when there is an occurrence of dread disease, it is likely that the policyholder would be hospitalised for the treatment. A similar approach is adopted for the current RBC framework.

4.35 As more data becomes available in future, MAS intends to review the calibration approach and derive shock factors that would be more reflective of the underlying experience of the other insured events.

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.

Lapse Risk Requirement

4.36 Lapse risk is the risk associated with the variability in liability cash flows due to the incidence of lapses (including forfeitures, surrenders etc) by policyholders. MAS used historical data in statutory Form 13, where n-year (where n =1 to 5) persistency rates were obtained for Whole Life, Endowment and Level Term since 2005. The relative change in lapse rate by duration was calculated for several insurers. On average for duration 0 to 2 years, the maximum relative change in lapse rate is observed to be around 50%.

4.37 MAS also referred to the approaches adopted by other insurance jurisdictions in calibrating lapse shocks. For example, under Solvency II, the capital requirements for the lapse risk is derived based on the higher of a permanent increase of lapse rates by 50%, a permanent decrease of lapse rates by 50% and a mass lapse event where 30% of the policies are surrendered. In Canada, the lapse rate is increased by 80% for first year and 50% thereafter. In the Ernst and Young study where the Solvency II factors are applied on Singapore data, it is also noted that the higher of a permanent increase or decrease of lapse rates by 50% gives a confidence level of between 95% and 99.5%.

4.38 MAS proposes to adopt a permanent increase/decrease of 50% to the best estimate lapse assumptions, and taking the higher liability value. Insurers will be familiar with the approach which is already practised under the current RBC framework, albeit at a lower level of shock. MAS recognises that there are many different factors which may affect policyholders' lapse behaviour, and that it may not be adequate to just consider an upward and downward lapse shock of the same quantum. However, MAS intends to test the impact of other lapse behavior as part of the industry-wide annual stress testing exercise.

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.

Conversion of Options Risk Requirement

4.39 Conversion of options risk is the risk associated with the variability in liability cash flows due to the incidence of policyholders exercising available options (for example, convertible term). Given the lack of suitable data to calibrate this risk, and that this is a risk associated with policyholders' behavior, just like lapse risk, MAS proposes to use the same level of shocks as prescribed for the lapse risk requirement module.

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.

Expense Risk Requirement

4.40 Expense risk is the risk associated with the variability in liability cash flows due to the incidence of expenses incurred. MAS used 10 years' historical data in statutory Form 2 (management expense figures) for calibration. The year-on-year change in the level of expenses is considered, given that insurers update their assumptions yearly (or more frequently) in view of the experience that emerges, and hence the best estimate expense assumption that will apply for the following year should reflect closely the current year's actual experience.

4.41 The change in the level of expenses is simulated for various insurers. A single weighted change (weighted by total assets) is then obtained for each group of simulations, and these are subsequently fitted to a normal distribution. Goodness of fit test is performed and the VaR (99.5%) yields approximately a 25% shock. Given that expense risk is more within the control of insurers, and most insurance jurisdictions use 10% as a permanent increase but with some further shock to inflation rate or higher shock applied for the first year, MAS proposes that the expense shock be 20% for the first year, and 10% thereafter.

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.

Life Insurance Catastrophe Risk Requirement

4.42 Insurance catastrophe risk stems from extreme or irregular events which effects are not sufficiently captured in the other C1 life risk requirement sub-modules. A pandemic event is one example.

4.43 In the first consultation, MAS proposed to introduce an explicit insurance catastrophe risk requirement for insurers. For life business, the proposed shock was an additional 1.5 deaths per 1000 lives[24]. Whilst most respondents agreed with the need to introduce an explicit insurance catastrophe risk requirement, several respondents felt that the 1.5 per 1000 shock was too severe, especially if diversification benefits were not allowed. The respondents were of the view that there were many positive factors (for example, socioeconomic) that might reduce the risk of a pandemic in Singapore. However, there were also some views that should a flu pandemic occur, the population density in Singapore might aggravate its effects.

4.44 Singapore only had three pandemic events over the last 100 years:

Spanish influenza (1918-1919)	Worldwide: 40% of population (or 500 million) infected and about 50 million of population died Singapore: 7.76 per 1000 lives died
Asian Influenza (1957-1958)	Worldwide: 20% of population infected and about 2 million of population died Singapore: 0.47 per 1000 lives died
Hong Kong Influenza (1967-1968)	Worldwide: 1 million of population died Singapore: 0.27 per 1000 lives died

4.45 Direct life insurers are required by MAS to conduct stress tests annually, and one of the prescribed scenarios include a pandemic event. Under this scenario, direct life insurers are subject to a mortality shock of an additional 1.5 deaths per 1000, a morbidity shock of 100 hospitalisation claims incidence per 1000 to rates across all ages, and investment shocks similar to the prescribed macroeconomic scenario. For the industry-wide stress test conducted in 2013, insurers were required to attribute the fall in CAR and FSR to the various shocks. The results showed that a morbidity shock can have a more significant impact on the capital positions of the insurers than a mortality shock.

4.46 During a pandemic event, we can expect to observe not just higher mortality rates, but an increase in the medical claims incidence as well. MAS noted that other jurisdictions[25] have also incorporated a morbidity shock in addition to the mortality

[24] At the time that the first consultation was published, a few jurisdictions including Solvency II were considering mortality shocks of 1.5 deaths per 1000 lives.

[25] APRA has incorporated a morbidity (specifically on disablement) shock in addition to a mortality shock for the life insurance catastrophe risk charge. Under the Swiss Solvency Test, insurers are

shock. Research around pandemic infection and hospitalisation rate seems to be limited worldwide. MAS used research by the World Health Organisation ("WHO") in 2008 [26] in calibrating the morbidity shock for the insurance catastrophe risk requirement for life business. Some loadings were made to account for the fact that the study was done some years back, and that there are now more strains of influenza capable of spreading on a worldwide scale and infecting a larger proportion of the human populations. It is stated in the WHO research that:

- Available data from previous pandemics and from seasonal human influenza studies suggest an attack rate (which is the proportion of the population that become infected in a given time period) of 15-35%. And this may be higher in densely populated sites, for example, up to 50-60%, as crowding may facilitate the transmission of influenza virus;
- Estimates from the more severe past pandemics suggest rates of severe illness (requiring hospitalisation) of 1-2% of those who fall ill. It is hypothesised that hospitalisation rates during a future pandemic may reach up to 10% in vulnerable populations and poorly-resourced settings.

4.47 MAS proposes to moderate the proposed mortality shock from 1.5 to 0.5 deaths per 1000. This seems reasonable given the statistics in paragraph 4.44. In addition, MAS proposes to introduce a morbidity shock of 40 hospitalisation claims incidence per 1000 to rates across all ages.

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.

Aggregating C1 Risk Requirements for Life Business

4.48 As mentioned earlier in Proposal 6, one of the ways in which diversification benefit will be recognised under RBC 2 is through a prescribed correlation matrix for aggregating specific C1 risk requirements for life business. Most jurisdictions prescribe a correlation matrix to account for the diversification benefit within insurance liability risk modules. MAS has referred to these matrices, as well as those used by some insurers for their own internal modelling.

required to consider increased deaths, increased hospitalisation and increased number of days absent from work under the pandemic event scenario.

[26] WHO guidelines on "Pandemic influenza preparedness and mitigation in refugee and displaced populations", published in 2008

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 Risk	Morbidity Risk
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 Risk	0.25	0	0.75	0.5	1	0.75
	Morbidity Risk	0.75	0.25	0.5	0.25	0.75	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 Risk Requirement + Lapse Risk Requirement + Conversion of Options Risk Requirement + Expense Risk Requirement)[27]

where

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

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

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

[27] Risk requirements which have not been considered under the prescribed correlation matrix will be added back to obtain the overall diversified C1 requirement for life business.

C1 Requirement for General Business

4.49 MAS will be introducing an explicit insurance catastrophe risk requirement for general business. A Natural Catastrophe Risk Working Group ("NatCat WG"), comprising MAS, academia, brokers, modelling firms, industry associations and the Singapore Actuarial Society, was formed in late 2013. The NatCat WG has been tasked to come up with some standardised catastrophe scenarios for the insurers to derive the general insurance catastrophe risk requirements, after taking into account the effect of any reinsurance arrangements. The NatCat WG aims to submit its proposal to MAS by end 2014.

4.50 The current premium liability and claim liability risk requirements for general business are already calibrated sufficiently close to the 99.5% confidence level. As such, MAS will retain the current premium and claim liability factors, and revisit the calibration closer to the date when the insurance catastrophe risk requirement for general business is more developed. This is a logical approach as we will not be considering the calibration of the premium and claim liability risk requirements in isolation from the insurance catastrophe risk requirement.

4.51 As a result, the insurance catastrophe risk requirement for general business, as well as the recalibrated premium liability and claim liability risk requirements, will be implemented at a later date than the rest of the calibration proposals under RBC 2, as they will be finalised later.

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?

C2 Requirement

Implicit Allowance for Diversification

4.52 As mentioned in paragraph 4.15, MAS proposes to account for diversification benefits implicitly within the calibration of each C2 risk requirement. The asset data which MAS collects on a regular basis allows the diversification benefit across the various asset risk types to be derived at the industry level, based on the average industry portfolio.

4.53 In order to derive the diversification across the various risk types, we first calculate the gains/losses that would have been experienced for exposures in each individual proxy for each risk type separately based on (1) the insurance industry exposure to that proxy and (2) the historical scenarios for that proxy, which gives

around about 2500 data points in total. The 0.5% percentile in gains/losses is taken, which is the 99.5% loss amount suffered for exposures of that proxy.

4.54 Having about 50 proxies gives us 50 independent 99.5% loss amounts (Say these are represented by A_1, A_2, A_3... A_{50}). We then calculate the gains/losses that would have been experienced by the industry across all proxies and risk types in each of the 2500 historical scenarios on an aggregated basis (across all risk types). The 0.5% percentile aggregated gains/losses is taken which is the 99.5% aggregate loss amount suffered across all risk types. Say this is amount is represented by B.

4.55 Total diversification, say represented by C, is then simply the difference between B and the sum of all ($A_1 + A_2 + A_3 +.... A_{50}$). The percentage diversification factor is taken as C divided by the sum of ($A_1 + A_2 + A_3 +.... A_{50}$), i.e. the percentage amount that the total losses have been reduced by. This essentially takes the diversification factor that is implied in the historical scenarios.

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.

Equity Investment Risk Requirement

4.56 Equity risk is the risk of economic loss due to changes in the price of equity exposures. Under the current RBC framework, the equity investment risk requirement is calculated as the sum of the equity specific and equity general risk requirements. For equity specific risk requirement, this is taken as 8% of the absolute value of the current market value of the position in each share (whether long or short). For equity general risk requirement, insurers have to allocate each equity investment to an appropriate country or territory, netting any long or short positions within these countries of territories, and then calculate the risk requirement as 8% of the absolute value of the current market value of the overall net long or short positions.

4.57 The current RBC framework does not differentiate between the listing status or location of listing of the equity securities (i.e. whether listed in Singapore or other

countries). Under the proposed equity investment risk requirement[28] under RBC 2, MAS proposes to introduce 3 distinct risk categories for equities, attracting different risk charges. The 3 risk categories are (1) Listed in Singapore or Developed Markets; (2) Listed in Other Markets and (3) Unlisted Equity (including hedge fund and private equity. This will allow the equity investment risk requirement to reflect the underlying risk of the insurers' equity exposures more accurately[29]. MAS notes that many major jurisdictions also make a similar distinction in their capital frameworks.

4.58 MAS used 10 years' historical data[30] for the following proxies to calibrate the 3 risk categories:

Listed in Singapore or Developed Markets	FSSTI Index and MSCI World Index
Listed in Other Markets	MSCI Emerging Markets Index
Unlisted Equity (including private equity and hedge funds)	S&P Listed Private Equity Index, LPX50 Private Equity index, EurekaHedge Hedge Fund Index and HFRX Global Hedge Fund Index

4.59 The raw data was converted to a stationary time series of daily 1- year rolling returns, resulting in more than 2500 data points in the empirical distribution. The risk requirement was derived by taking the lower 0.5% percentile of the resulting distribution. The calibration work indicated that the empirical distribution is leptokurtic (with higher peaks at the mean and fatter tails), instead of normally distributed. This observation is consistent with the market view on the distribution of equity returns.

[28] The types of instruments for which the equity investment risk requirement is applicable will remain the same, and are as specified in paragraph 2(1) of the Fourth Schedule of the Insurance (Valuation and Capital) Regulations 2004. However, so as to be aligned with Notice MAS 637 for banking, debt instruments which are convertible into equity at the option of the issuer or automatically by the terms of the instruments shall be characterised as equity exposures. For avoidance of doubt, paragraph 2(2) (on how to the derive the position in relation to every depository receipt, warrant, convertible security, or other equity derivative), paragraphs 2(6)-2(8) (on adjustments for warrants or options) and paragraphs 2(9)-2(10) (on interest rate add-on for equity derivatives) of the Fourth Schedule will still be applicable under RBC 2.

[29] Calibration work showed that the different risk categories yielded different levels of equity shocks which corresponded to a VaR (99.5%) over one year period.

[30] The time period used must be sufficiently long so as to ensure an adequate number of data points, but not too long such that the historical data becomes irrelevant and not reflective of the future risk. The time period chosen also suitably includes stressed conditions in the global markets during the 2008 Global Financial Crisis as well as the more recent Eurozone Crisis.

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 (Annex D).

Treatment of Collective Investment Schemes ("CIS")

4.60 CIS are currently treated as equity and subject to equity specific and general risk charges. The only exception is where the CIS has a mandate to invest in debt securities and debt derivatives only, under which MAS permits insurers to adopt a look-through approach. Under this approach, CIS investments are treated as a debt security, attracting a debt investment risk charge[31] instead of an equity investment risk charge.

4.61 MAS proposes to allow insurers to apply the look-through approach more extensively under RBC 2, including where the underlying assets of the CIS are other asset classes besides debt securities, or a mix of assets from various asset classes. Insurers will be also be allowed to allocate the underlying exposures in reference to the investment mandate, but subject to the condition that the allocation is done in a manner that produces the maximum overall risk requirement. In cases where the insurer chooses not to adopt the look-through approach, either based on the actual allocation of the underlying assets or on the investment mandate, the insurer will be required to apply a 50% risk charge to the market value of the CIS.

[31] For these, the insurer shall treat the CIS as a single debt security and apply the calculation method assuming the average maturity, coupon, credit quality of the debt securities or debt derivatives underlying the CIS

4.62 This approach is consistent with recent developments in other insurance jurisdictions[32] as well where the look-through approach is taken with regard to trusts and/or collective investment funds. The banking capital rules in MAS Notice 637 also allow a look-through approach with regard to the calculation of credit Risk Weighted Assets ("RWA") for equity exposures.

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.

Countercyclical Adjustment

4.63 MAS explored introducing an adjustment mechanism to the proposed equity risk requirement factors to incorporate a countercyclical element within the overall equity risk requirement. This serves to reduce unintended and potentially detrimental pro-cyclical effects. For example, an overly onerous equity risk requirement during down cycles could lead to a fire sale of equity assets, which may in turn impact the stability of financial markets. The adjustment term can decrease or increase the standard equity risk factor depending on the market environment. In particular, the adjustment should reduce capital requirements in times of financial distress.

4.64 There are other ways in which the effects of pro-cyclicality can be reduced under the RBC framework. For example, recovery periods for insurers to restore their PCRs can be extended in the event of exceptional falls in financial markets. However, there is merit to incorporating a more explicit and dynamic mechanism within the risk charging framework to achieve the above objective.

[32] Namely OSFI (Canada), APRA (Australia), BNM (Malaysia), Solvency II (European Economic Area).

Consultation Question 5

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

4.65 One possible approach to designing the countercyclical adjustment is to measure the extent to which the current level of the equity market is above or below its historical moving average. Where the current level is higher than the moving average, the equity risk requirement will be increased, and where it is lower, the risk requirement will be reduced. The amount of adjustment that can be made can be subject to a floor and a cap.

4.66 This is similar in concept to the symmetric adjustment being considered for the equity risk module under Solvency II's proposed standardised formula approach. MAS notes that some commentators have observed that such an approach may not always achieve its objective of reducing pro-cyclicality; for example, in market rebounds from severe downturns, the mechanism would likely increase the risk requirement. In addition, as the mechanism impacts the standard equity stress at all times, it would result in a volatile equity investment risk requirement, which creates uncertainty for insurers. Some modifications to this approach may therefore be needed for it to achieve its stated objectives.

4.67 The following are some principles that can guide MAS in the design of the adjustment mechanism, which may address the above concerns:

- The adjustment should be based on a predetermined formula that has a sound basis and is easily explainable – the adjustment mechanism should be determined in advance so that it does not introduce any ambiguity as to the timing and magnitude of the adjustment. Adjustments should also not be arbitrarily determined and the mechanism should be both intuitive and not overly complex;

- The adjustment should only be activated upon significant movements in equity prices – Fluctuations in equity prices are to be expected. As such the adjustment should only be triggered when there is a significant and sudden movement upwards (which may indicate that equity risk has increased), or downwards (which may indicate that markets are heading towards a crisis). This also ensures that the adjustment mechanism does not result in volatile equity risk requirements and hence volatile PCR, which creates uncertainty for insurers and may undermine investors' and analysts' confidence in the overall capital framework;

- The adjustment should apply only to the Singapore listed equity portfolio – Most of the equity investments held by insurers are in Singapore-listed

equities. One of the unintended consequences which the countercyclical adjustment mechanism aims to prevent is a fire sale of equity assets during down cycles, which may exacerbate market instability. In the case of non-Singapore listed equities, the likelihood of this occuring is remote, as it is unlikely that the sale of non-Singapore listed equities by Singapore licensed insurers would have a significant impact on the market for these equities.

- The adjustment should incorporate an appropriate proxy to mirror the Singapore equity market performance, such as the Singapore Straits Times ("STI") Index – To minimise basis risk between the type of equities held by the industry and the proxy, the adjustment should only be applied if an insurer holds a sufficiently diversified portfolio of equities;

- The adjustment should not cause significant deviation in the equity risk requirement such that it compromises the level of protection accorded by the capital framework to the policyholders.

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?

4.68 Operational and governance issues, such as the division of responsibilities between the regulator and industry in calculating, publishing and reviewing the adjustments, can be considered later.

Interest Rate Mismatch Risk Requirement

4.69 Changes in market interest rates affect the prices of debt securities as well as policy liabilities where the valuation of policy liabilities requires discounting of future policy liability cash flows using the market yield of risk free government securities. Interest rate mismatch risk is currently addressed as part of the debt investment and duration mismatch risk requirement, which is the sum of the following:

- Debt general risk requirement[33] – intended to capture the changes in market value of debt securities from interest rate movements. It is calculated by splitting positions into long and short positions, and grouping them under one of the 16 time bands. The bands reflect the duration and hence volatility. A fixed factor, varying between 0% at the short end to 12.5% at the long end, is then applied to the net position within each band. Finally, further calculations are made to disallow some of the offsetting within time bands, and to allow some offsetting across time bands;

- Liability adjustment requirement – intended to capture the changes in the value of policy liabilities from interest rate movements. It is calculated by adjusting the base interest rate assumptions by an interest rate adjustment, and revaluing the policy liabilities under the increasing and decreasing interest rate scenarios. The change in the policy liabilities is taken as the liability adjustment requirement;

- Debt specific risk requirement – intended to capture credit risk of debt securities. It is calculated as the product of the market value of the debt security and a risk factor that depends on the type of issuer (e.g. government debt securities, qualifying debt securities or others), and term to maturity for qualifying debt securities.

4.70 Currently, there are differences between the interest rate related factors that are applied to debt securities (in the debt general risk requirements) and policy liabilities (in the liability adjustment requirement). Under the proposed interest rate mismatch risk requirement[34] under RBC 2, which replaces the debt general risk requirement and liability adjustment requirement, MAS proposes to require insurers to calculate their interest rate mismatch risk requirement based on a single set of interest rate adjustments that are to be consistently applied on their debt securities

[33] Debt general risk requirement and liability adjustment requirement are calculated under both a decreasing and increasing interest rate scenario, and the final duration mismatch risk charge is taken as the loss amount from the scenario that results in the higher loss.

[34] The types of instruments for which the interest rate mismatch risk requirement is applicable will remain the same, and is specified in paragraph 3(1) of the Fourth Schedule of the Insurance (Valuation and Capital) Regulations 2004 under debt investment risk requirements. However, so as to be aligned with Notice MAS 637 for banking debt instruments which are convertible into equity at the option of the issuer or automatically by the terms of the instruments shall be characterised as equity exposures. For avoidance of doubt, paragraphs 3(2)-3(3) (on how to derive the position in relation to every debt derivative), 3(5)-3(6) (on how a pair of long and short positions in the same debt security may be excluded from calculations if they are matched) and paragraphs 3(13)-3(14) (on adjustments for options) of the Fourth Schedule will also still be applicable.

as well as policy liabilities. The interest rate mismatch risk requirement would be the resultant change in net asset value[35].

4.71 The current interest rate adjustments are based on absolute interest rate changes. This does not take into account that interest rate levels tend to have upper and lower bounds. As interest rates trend downwards, any further downward movement is likely to be less in absolute terms. Similarly, as interest rates trend upwards, any further upward movement is also likely to be capped at an upper bound. In addition, interest rates have been seen to also exhibit mean reverting behavior which may not be recognised if absolute interest rate adjustments are used.

4.72 MAS proposes to impose the interest rate adjustments based on increasing and decreasing percentage changes, rather than absolute changes. MAS recognises that it may not be adequate to just consider increasing and decreasing percentage changes of the yield curve. However, this is a common approach taken in most jurisdictions, and relatively simple to do. MAS intends to test the impact of other interest rate movements, for example, inversion of yield curve, or flattening of yield curve, on our insurers by incorporating these as scenarios under the annual industry-wide stress test exercise.

4.73 Based on an analysis of the sovereign and corporate debt holdings of the insurance industry, the appropriate yield curve movement to be modelled to derive the suitable interest rate adjustments would be the SGS yield curve and the US Treasury yield curve. As such, MAS made use of 10 years' historical data for the following proxies to calibrate the interest rate adjustments:

- Singapore and United States Government yield curve – 3M, 1Y, 2Y, 5Y, 10Y, 15Y, 20Y, 30Y

4.74 The raw data was converted to a stationary time series of daily 1- year rolling returns, resulting in more than 2500 data points in the empirical distribution. The interest rate adjustments were derived by taking the lower 0.5% percentile of the resulting distribution, with some smoothing.

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[36]. 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.

[35] Taken to be value of assets less liabilities

[36] The QIS 1 technical specifications contain more instructions and examples on how this can be done.

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

Recognising Diversification between Insurance Funds

4.75 Given that interest rates can only move either upwards or downwards at a given point in time, and for each insurance fund, the interest rate mismatch risk requirement is based on the interest rate scenario (either upwards or downwards) that would give the higher risk requirement, some diversification benefits can be recognised between the insurance funds at the company level.

4.76 This can be achieved by aggregating the net asset value changes from either scenario across the insurance funds to determine a dominant scenario for the company as a whole. Such an approach may result in a reduction of interest rate mismatch risk requirement for the insurer as a whole.

4.77 However, MAS proposes to exclude the Participating Fund from the consideration of the diversification benefits, given that any excess capital in the Participating Fund is not fungible enough to support other insurance funds.

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).

Credit Spread Risk Requirement

4.78 The credit spread risk requirement[37] is a new risk requirement under RBC 2 that will replace the existing debt specific risk requirement, and will capture the spread risks more explicitly. For avoidance of doubt, the credit spread risk requirement will also apply[38] to the portfolio of policy liabilities that has been set aside under the MA proposal (mentioned in Section 3).

4.79 Based on an analysis of the corporate debt holdings of the insurance industry, the main exposures were SGD and USD issuances. In addition, a very high percentage of issuances were of investment grade and above, followed by unrated SGD denominated bond issuances. However, due to a lack of credit spread related data for the SGD corporate bond market, reliance is placed on USD credit spread data instead, where there is ample data across tenors and ratings. Reliance on USD credit spread data is also appropriate as about half of the corporate bonds held by our insurers are denominated in USD. Besides, the SGS and US Treasury yield curves have shown to be highly correlated.

[37] The types of instruments for which the credit spread risk requirement is applicable will remain the same as that applicable under the debt specific risk requirement, and is specified in paragraph 3(1) of the Fourth Schedule of the Insurance (Valuation and Capital) Regulations 2004 under debt investment risk requirements. However, so as to be aligned with Notice MAS 637 for banking debt instruments which are convertible into equity at the option of the issuer or automatically by the terms of the instruments shall be characterised as equity exposures. For avoidance of doubt, paragraphs 3(2)-3(3) (on how to derive the position in relation to every debt derivative), 3(5)-3(6) (on how a pair of long and short positions in the same debt security may be excluded from calculations if they are matched) and paragraphs 3(13)-3(14) (on adjustments for options) of the Fourth Schedule will also still be applicable.

[38] The discount rates that will be used to discount these liabilities will be increased by a percentage (as specified in the QIS 1 technical specifications) of the amount of credit spread adjustment applicable to the assets that have been set aside to back that portfolio of liabilities.

4.80 MAS used 10 years' historical data for the following proxies to calibrate the credit spread shocks[39]:

- United States YTM BFV Composite Corporate curves– 2 year, 3 year, 5 year, 10 year, 30 year for the following credit ratings; AAA, AA, A, BBB, BB, B
- United States YTM BFV Government Bond curves – 2 year, 3 year, 5 year, 10 year, 30 year

4.81 The raw data was converted to a stationary time series of daily 1- year rolling basis point change in credit spreads, resulting in more than 2500 data points in the empirical distribution. The credit spread shocks were derived by taking the upper 99.5% percentile of the resulting distribution, with some smoothing.

4.82 Some reasonableness checks were conducted on the proposed credit spread shocks. First, MAS referred to several benchmark SGD issues to verify that the credit spread movements observed in the SGD market (during the 2008 crisis) are comparable to the experience derived from the USD data. Second, MAS also compared the likely fall in the value of corporate bonds held by insurers based on the calibrated credit spread shocks against the earlier proposed 40% risk requirement for equities listed in Singapore and Developed markets. One would reasonably expect that the fall in prices of investment grade corporate bonds to be less than that observed in the equities listed in Singapore and Developed markets. These checks indicate that the proposed credit spread shocks are reasonable.

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	100	120	150	200	340	490

[39] The implied credit spread is the difference between the US Composite Corporate curves and the US Government Bond curves.

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.

Unrated Bond Issues

4.83 Our insurers currently hold about 20% of the corporate bond holdings in the form of unrated SGD denominated issues, with a large proportion issued by Singapore Statutory Boards. Recognising the high credit quality of these issues despite its unrated status, MAS proposes that for corporate bonds issued by Singapore Statutory Boards, the applicable credit spread shocks will be tied to the sovereign rating of the Singapore government, which is currently at "AAA". This will also extend to corporate bonds issued by recognised multilateral agencies.

4.84 Unrated debt securities currently attract the same risk charge as that of non-investment grade debt securities under the RBC framework. Though there was no specific proposal on the treatment of unrated bonds in the first consultation, several respondents raised the need to reconsider the treatment for unrated bonds issued by financially strong debt issuers who did not seek a rating. MAS will be working with the industry on options to encourage rating of unrated corporate debt. Meanwhile, for the QIS, MAS proposes to assign a credit spread shock of between "BBB" and "BB" for unrated SGD issues, other than those issued by Singapore Statutory Boards and multilateral agencies.

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).

Sovereign Bonds

4.85 Currently, debt securities issued or fully guaranteed by governments or central banks of countries or territories with a sovereign rating of investment grade[40] are exempted from the debt specific risk requirement (that is, the applicable debt specific risk requirement becomes zero). However, the bond yields of several European countries with investment grade sovereign ratings have risen significantly due to higher perceived credit risk during the recent Eurozone crisis. As such, 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.

4.86 However, MAS recognises that government bonds issued in the national currency of the country should be treated as being of higher quality than a similarly rated corporate bond issued by a private corporation. As such, for debt securities issued by governments or central banks with a credit rating below "A-" and in the national currency of the country, these should be notched up to the next higher credit rating when deriving the credit spread shock.

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).

Treatment for Structured Products

4.87 There are currently no explicit instructions or rules on the risk charging mechanism for Structured Products under the RBC framework. MAS proposes to introduce explicit provisions on the risk charging treatment for these types of investments. This helps to ensure that the calculated risk requirement is appropriate and suitable given the underlying risks of the structured product.

[40] Debt securities that are issued by a country that does not have a sovereign rating, but are denominated in the national currency of a country and have a residual maturity of 12 months or less also enjoy a zero risk charge

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	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.

Property Investment Risk Requirement

4.88 Property risk is the risk of economic loss due to changes in the price of property exposures. Under the current RBC framework, the property investment risk requirement is only applicable for the immovable properties of the insurer. The risk requirement is 16% of the total value of the property.

4.89 The immovable property exposures of the insurers are located almost entirely in Singapore, and comprise mainly office spaces as well as some exposure to private residential properties and commercial/ industrial spaces. As such, MAS used 10 years' historical data for the following property price indices as proxies to calibrate the risk requirement:

- URA's Property Price Index of Office Space in Central Area
- URA's Property Price Index of Condominiums
- URA's Property Price index of Office Space in Fringe Area
- URA's Property Price Index of Shop Space in Central Area
- URA's Property Price Index of Shop Space in Fringe Area

4.90 The raw data was converted to a stationary time series of quarterly 1- year rolling returns, resulting in about 40 data points in the empirical distribution. The risk requirement was derived by taking the lower 0.5% percentile of the resulting distribution. The calibration work indicated that the empirical distribution is leptokurtic (with higher peaks at the mean and fatter tails), instead of normally distributed. This observation is consistent with the market view on the distribution of property returns.

4.91 The proposed property investment risk charge worked out to be 30% for immovable properties, which already takes into account the diversification benefits implicitly. This factor also incorporates an adjustment for the illiquidity risk. This accounts for the risk that immovable properties are illiquid and may be subject to sale at a discount if quick liquidation is required to support solvency.

4.92 MAS noted that the historical price movements of Real Estate Investment Trusts ("REITs") seem more aligned with the losses of equity investments than

property investments, especially under stressed market conditions. As such, where the underlying assets of the CIS are property investments (for example, REITs), insurers will not be allowed to apply the 'look through' approach when risk charging CIS in this case. Instead, the property investment risk requirement for such CIS will be 35%.

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.

Foreign Currency Mismatch Risk Requirement

4.93 Foreign currency mismatch risk is the risk of economic loss due to adverse movements in the value of foreign currencies against the Singapore dollar. Under the current RBC framework, the foreign currency mismatch risk requirement is only imposed on Singapore Insurance Funds ("SIF"). For each SIF, insurers are required to convert their net open position in each currency to Singapore Dollar at the prevailing spot rate. The risk exposure is taken as the higher of the aggregate of net open positions in all currencies where the net open position is positive, and the absolute for currencies where it is negative. The risk requirement is then taken as 8% of the calculated exposure less 10% ("concession") of the total value of assets in the fund, subject to a minimum of zero.

4.94 The concession of 10% was given in view of industry feedback that there was a lack of supply and liquidity of SGD denominated assets[41] when RBC was first introduced in 2004. As such, insurers, especially those writing long-term business, would need to invest in some non-SGD denominated assets to match the long duration of their liabilities. However, almost a decade later, SGD debt issuances have almost doubled from 2004 to 2012 (see table below). Hence, it should not be difficult for insurers to find appropriate SGD-denominated assets to match the SGD denominated liabilities of similar duration. Besides, insurers may also choose to use

[41] In particular, the debt securities, but same observation could be made of SGD denominated securities in other asset classes.

foreign currency derivative contracts to hedge their foreign currency exposures back into SGD.

S$ bil	2004	2011	2012
SGD Corporate Bonds	58.2	93.7	109.1
Treasury Bills	20.2	59.1	60
SGS Bonds	52	79.4	82.6
	130.4	**232.2**	**251.7**

4.95 Therefore, MAS proposes to remove this 10% concession for computation of the foreign currency mismatch risk requirement for SIF under RBC 2. This is also appropriate given the increased volatilities seen in currency markets in recent years, and insurers should hold sufficient risk capital against the economic risks posed by foreign currency mismatches on their balance sheets.

4.96 In addition, MAS also proposes to introduce a foreign currency mismatch risk requirement for the OIF given that the economic risk posed by currency fluctuations applies equally to the OIF. However, similar to how the risk requirement was progressively introduced for SIF in 2004, MAS proposes to provide a concession of 20% of the total value of assets in the OIF. This is in recognition that insurers may have liability exposures in territories where the financial markets may not have the appropriate (in terms of nature, duration or currency) local currency denominated assets for the insurers to purchase.

4.97 The majority of insurers' foreign currency exposures are denominated in US Dollar, followed by the Euro, Sterling Pound, Australian Dollar, Hong Kong Dollar, Japanese Yen, Korean Won, Thailand Baht and Malaysian Ringgit. As such, MAS used 10 years' historical data of the following proxies to calibrate the foreign currency mismatch risk requirement:

- FX Indices – USD/SGD, EUR/SGD, GBP/SGD, AUD/SGD, HKD/SGD, JPY/SGD, KRW/SGD, THB/SGD, MYR/SGD

4.98 The raw data was converted to a stationary time series of daily 1- year rolling returns, resulting in more than 2500 data points in the empirical distribution. The risk requirement was derived by taking the lower 0.5% percentile of the resulting distribution. The proposed foreign currency mismatch risk requirement is 12%, which already takes into account the diversification benefits implicitly.

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

Counterparty Default Risk Requirement

4.99 Counterparty default risk is the risk of economic loss due to unexpected default of the counterparties and debtors of insurers. Counterparty default risk is currently addressed in several different risk modules under the RBC framework, for example, in the loan investment risk requirement, derivative counterparty risk requirement and the miscellaneous risk requirement (covering e.g. bank deposits, reinsurance recoverable and outstanding premiums & agents' balances). In addition, the reinsurance adjustment, which is treated as a financial resource adjustment under the current framework, also addresses reinsurance counterparty default risk in relation to future policy liability cash flows.

4.100 All these risk modules ultimately make reference to a similar counterparty default table (which differentiates by credit rating), though some other additional factors are applied:

Risk Module	Applicable Risk Charge	Other Notes
Loan Investment Risk Requirement	8% X Counterparty Risk Factor[42]	
Derivative Counterparty Risk Requirement	8% X Counterparty Risk Factor	
Miscellaneous Risk Requirement		
- Deposit with a bank or deposit-taking institution which has a rating of at least investment grade	A factor ranging from 0.25% to 1.6%	
- Reinsurance recoverables	Factor A (which depends on ageing period) x Factor B (which depends on licensing status of reinsurance counterparty) x Counterparty Risk Factor	Factor A ranges from 8% to 100% depending on ageing period Factor B = 100% for counterparty which is a licensed insurer; 150% for authorised reinsurer, related insurer and head office; 200% for unlicensed insurer.
- Outstanding premiums	A factor ranging from 8% to 100% depending on ageing period	
- Intra-group balances	A factor ranging from 8% to 100% depending on outstanding period	
- Others	8%	
Reinsurance Adjustment	Factor (depending on licensing status) x Counterparty Risk Factor	The first factor is 0%, 50% or 100% depending on the licensing status of the reinsurance counterparty

4.101 A new counterparty default risk requirement will be introduced under RBC 2[43], which will cover the following risks:

- Loan Counterparty
- Derivative Counterparty
- Reinsurance Recoverable Counterparty
- Outstanding Premiums Counterparty

[42] Counterparty Risk Factor is as set out in Table 11 of the Sixth Schedule of the Insurance (Valuation and Capital) Regulations 2004

[43] Reporting wise, insurers will still be required to show the breakdown of the counterparty default risk requirement into the various sources above.

- Bank Deposit Counterparty
- Any other counterparty risk

4.102 MAS proposes to simplify the computation of the counterparty default risk requirement[44] by making reference to the following calibrated factors:

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

4.103 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.

4.104 Data from Standard & Poors ("S&P") and AM Best Company ("AM Best") have been used for calibration of the counterparty default risk requirement:

- S&P – Global Corporate Bond Default Study which covers actual annual defaults by rating from 1984 – 2012. This study analyses the rating histories of 16,005 companies that S&P rated as of 31 Dec 2008, or that were first rated between that date and 31 Dec 2012, and includes industrials, financial institutions and insurers with long term local currency ratings.
- AM Best – Idealised default rates split by corporate issues, insurers and reinsurers by rating

4.105 First, the raw data of S&P global default experience was converted to a stationary time series of annual defaults by credit rating. There were about 30 data points for each credit rating. The calculated mean and standard deviation are then used to fit the data to a normal distribution for each credit rating separately. The lower 0.5% percentile value from the fitted normal curve is taken.

[44] The risk exposures for all the various risks will remain the same as that prescribed in the Insurance (Valuation and Capital) regulations 2004.

4.106 The AM Best data provides a useful split between corporate issues, insurers and reinsurers, whilst the S&P experience is based on all corporate bonds without any breakdown by types of institutions. Thus we used the AM Best data to fine-tune the default rates obtained from the S&P experience, to make the rates more fit for purpose.

4.107 We assumed that the standard deviation of annual defaults within each credit rating for the AM Best experience follows the S&P experience. Thus, we assumed that the AM Best experience is normally distributed for each credit rating, and a normal distribution was fitted using the mean experience from the AM Best data and the standard deviation from the S&P experience. The lower 0.5% percentile value from the fitted normal curve is taken. The resulting counterparty default risk charge table was moderated slightly for reasonableness.

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[45] 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.

4.108 The current computation of reinsurance adjustment is based on the licensing status (for example, licensed, authorised, unlicensed) of the reinsurance counterparty[46]. Given that the credit risk posed by a particular reinsurance counterparty does not primarily depend on whether that counterparty is licensed by MAS, we propose to remove reference to the licensing status of the reinsurance counterparty from the reinsurance adjustment formula (i.e. the reinsurance counterparty factor, B). Hence the main determinant would be the counterparty default table set out in Proposal 30.

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

4.109 MAS will be keeping the current methodology of deriving the C3 requirement for the purpose of the QIS. In practice, insurers try to diversify their assets amongst the counterparties to minimise the C3 requirement. As such, this risk requirement is typically very small, if not absent.

[45] These are mainly policyholders and it would be too onerous to treat them in the same category of "CCC+ and below" as rating is not relevant for them in the first place.

[46] Under the current RBC framework, the reinsurance adjustment is calculated as:

A x B x C, where

A= Reinsurance reduction, which is broadly the reduction in the value of liabilities due to reinsurance ceded to the reinsurance counterparty;

B= The reinsurance counterparty factor, which depends on whether the reinsurer is licensed, authorised or a related corporation of the insurer or where the insurer is incorporated outside Singapore, its head office or a branch of its head office or otherwise; and

C = The appropriate risk factor which depends on the credit rating of the reinsurer

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?

C4 Requirement

4.110 In the first consultation, MAS proposed introducing an explicit operational risk requirement within the capital framework. Operational risk refers to the risk of loss arising from complex operations, inadequate internal controls, processes and information systems, organisational changes, fraud or human errors, (or unforeseen catastrophes including terrorist attacks). Currently there is no explicit risk charge for operational risk under the RBC framework, though operational risk is assessed as part of MAS' ongoing supervision of insurers. However, both MAS' banking capital framework and a number of major jurisdictions have explicitly introduced capital requirements for operational risk in their capital framework.

4.111 MAS is of the view that operational risk is a relevant and material risk that should be addressed in the capital framework. However, as methodologies to quantify operational risk continue to evolve globally and collection of operational risk data is limited for the insurance industry, a simplified formula was proposed, with a cap:

> *x% of the higher of the 3 years' average of:*
>
> *a) earned premium income; and*
>
> *b) gross policy liabilities,*
>
> *subject to a maximum of 10% of the total risk requirements*
>
> *where x=4% (except for investment-linked business, where x=0.25% given that most of the management of investment-linked fund is outsourced)*

4.112 The operational risk charge proposal generated many responses. Whilst respondents were generally not opposed to the idea of introducing an explicit operational risk charge, there were broadly two views on how operational risk should be treated. One option was to address operational risk fully under the Enterprise Risk Management ("ERM") framework, whilst the other option was to have an explicit operational risk charge under RBC 2 which incentivises good operational risk management.

4.113 On the formula itself, many respondents agreed that having a simple formula was reasonable but proposed fine-tuning to incentivise insurers to reduce operational risk. There were some suggestions to tier the operational risk requirement according to the insurers' supervisory risk ratings or some other benchmarks reflective of the quality of the insurers' operational risk management standards. The proposed formula also did not differentiate between operational risk profiles and risk management framework in place, and might penalise growth. In addition, some respondents provided feedback that written premium was more reflective of transactional risk, and related to the process of writing the business rather than the accounting process of earning it. Respondents also generally supported using gross of reinsurance figures as the use of reinsurance was meant to mitigate insurance and not operational risk.

4.114 MAS wishes to highlight that the other risk charges do not take into account the insurers' own risk management standards given that a standardised approach for computing risk charges is being used. For any risk (including operational risk) that is not adequately addressed under the standardised approach, MAS will have the flexibility to impose additional capital requirements, as mentioned in paragraph 2.8. To avoid penalising growth, MAS has put in a cap to limit the amount of operational risk charge.

4.115 MAS is of the view that the formula for calculating the operating risk charge should be kept simple at this stage as operational risk is unlikely to be a very significant risk for insurers, compared to other types of risks like insurance and market risks. MAS will refine its methodology in future as more data becomes available and practices are more established internationally.

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[47]; 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.

[47] For life insurance, this will be the Gross Premium figure taken from Form 2.

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.

Use of Internal Model

4.116 In the first consultation, MAS proposed to allow the use of internal models in the next phase of the RBC 2 review, after the implementation of the standardised approach. The internal models, which would be subject to approval by MAS, would have to be calibrated at the same level as the standardised approach.

4.117 This would allow the larger and more complex insurers time to prepare themselves for a more sophisticated and tailored approach, and for MAS to plan resources for approval of internal models. MAS would also be able to check the reasonableness of the internal model assumptions and results against the experience of the standardised approach.

4.118 Most respondents agreed with the proposal, but some requested MAS to allow the partial use of internal models in the interim. Several respondents also suggested allowing the use of internal models approved by regulators of similar standing or subjecting such models to a shorter approval process. On the other hand, several respondents requested that internal models not be made a mandatory requirement as it would not be practical to expect smaller insurers with no relevant expertise to construct their own internal models.

4.119 MAS observes generally from other jurisdictions' experiences that the approval of internal models can be time-consuming and resource-intensive, for both insurers and regulators. As such, MAS will only allow the use of internal models, partial or otherwise, at a later stage, after the implementation of the standardised approach. Any evaluation of the insurers' head offices' or parents' internal models will also be similarly carried out at this later stage. MAS will give consideration to the suggestion for expedited approval under appropriate circumstances.

4.120 Lastly, the use of internal models is by no means compulsory. Generally, insurers can continue to rely on the standardised approach even if internal models are allowed at a later stage.

5 COMPONENTS OF AVAILABLE CAPITAL

5.1 The amount of capital available to meet the TRR is referred to as "financial resources" ("FR") under the RBC framework. FR at the company level comprises three components, namely Tier 1 resources, Tier 2 resources and the allowance for provision for non-guaranteed benefits ("APNGB").

- Tier 1 resources are capital resources of the highest quality. These capital instruments are able to absorb losses on an on-going basis. They have no maturity date and, if redeemable, can only be redeemed at the option of the insurer. They should be issued and fully paid-up and non-cumulative in nature. They should be ranked junior to policyholders, general creditors, and subordinated debt holders of the insurer. Tier 1 resources should neither be secured nor covered by a guarantee of the issuer or related entity or other arrangement that may legally or economically enhance the seniority of the claims vis-à-vis policyholders. Tier 1 resources are generally represented by the aggregate of the surpluses of an insurer's insurance funds. A locally incorporated insurer may add to its Tier 1 resources its paid-up ordinary share capital, its surpluses outside of insurance funds and irredeemable and non-cumulative preference shares.

- Tier 2 resources are only applicable to locally incorporated insurers and consist of capital instruments that are of a lower quality than Tier 1 resources. Examples of these instruments include redeemable or cumulative preference shares and certain subordinated debt. Tier 2 resources in excess of 50% of Tier 1 resources will not be recognised as FR.

- The APNGB is applicable only to insurers who maintain a participating fund. As the APNGB is only available to absorb losses of the participating fund, the allowance is adjusted to ensure that the unadjusted capital ratio[48] of the insurer is not greater than its adjusted ratio[49].

5.2 When RBC was first introduced, its Tier 1 and Tier 2 capital components were largely aligned with those under MAS' capital framework for the banking sector then, with the exception of surpluses in the insurance funds or balance in the surplus account, which were insurance-specific in nature. As an integrated supervisor overseeing banking and insurance entities in Singapore, MAS continues to aim for a level playing field across the financial sector by having a consistent regulatory and supervisory framework for financial institutions.

[48] Unadjusted capital ratio, or CAR, is the ratio of total FR to TRR.
[49] Adjusted capital ratio, or adjusted CAR, is the ratio of FR (excluding FR relating to participating fund) toTRR (excluding TRR relating to participating fund).

Alignment with Capital Framework for Banks

5.3 Since the introduction of RBC in 2004, there have been developments in the capital framework for banks. MAS Notice 637 on Risk Based Capital Adequacy Requirements for Banks Incorporated in Singapore was amended in September 2012 to implement Basel III capital reforms by the Basel Committee on Banking Supervision ("BCBS") as well as other policy enhancements arising from MAS' ongoing review. It was thus an opportune time for MAS to conduct a more comprehensive review of the components of available capital for insurers against the revised Notice 637 and propose alignment where appropriate.

Introduction of Common Equity Tier 1 ("CET1") Concept

5.4 Under the capital framework for banks, available capital now consists:

a) Tier 1 capital, comprising of:
   i. CET1 capital;
   ii. Additional Tier 1 ("AT1") capital; and
b) Tier 2 capital

5.5 CET1 capital represents the highest quality component of capital. It takes the first and proportionately greatest share of any losses as they occur. The introduction of CET1 capital is consistent with the objective of improving the quality of the regulatory capital base. As such, MAS proposes to define CET1 for the insurance sector as well.

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

Renaming and Reclassification

5.6 After CET1, Additional Tier 1 ("AT1") capital is the next class of capital available to locally incorporated banks and is subordinated to depositors, general creditors and holders of Tier 2 capital instruments of the bank. It comprises instruments that have neither maturity date or provisions that create an incentive for the bank to redeem the capital instrument. AT1 capital allows the bank full discretion at all times to cancel distributions or payments with regard to dividend or coupon on the capital instrument. AT1 instruments classified as liabilities under accounting standards must have a principal loss absorption feature through either (i) conversion to common shares at a pre-specified trigger point or (ii) a write-down mechanism which allocates losses to the instrument at a pre-specified trigger point[50].

5.7 Tier 2 capital instruments are subordinated to depositors and general creditors of the bank, and do not have any provision that create incentives for the bank to redeem the instruments[51].

5.8 In view of the changes to MAS 637, MAS proposes some alignment in the classification and definition of the available capital components for insurers. There will no longer be the standalone classification of Irredeemable and Non-Cumulative Preference Shares and Irredeemable and Cumulative Preference Shares under the current RBC framework. These instruments will be classified as either AT1 or Tier 2 capital based on their features. This is consistent with the principle of focusing on the loss absorption capacity of capital instruments, which is determined by the characteristics rather than form of the instruments. MAS will also remove the approval regime for the Approved Tier 1 and Qualifying Tier 2 capital instruments.

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;

[50] Please refer to paragraph 6.2.2 of MAS 637 for the minimum requirements for AT1 capital instruments.

[51] Please refer to paragraph 6.3.2 of MAS 637 for the minimum requirements for Tier 2 capital instruments.

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.

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.

Minimum Floors on CET1 and Tier 1 Capital

5.9 Currently, there are limits[52] on the amount of certain Tier 1 or Tier 2 capital components that can be recognised as financial resources. These limits are expressed as a percentage of the Tier 1 or Tier 2 capital. With the reclassification changes proposed in the earlier section, it is necessary for such limits to be amended, so as to achieve the objective of ensuring that a prudent level of available capital is held in higher quality capital.

5.10 MAS proposes to replace the limits with minimum floors on the CET 1 and Tier 1 capital. The floors are not set as a percentage of the total Tier 1 and Tier 2 capital to avoid the perverse outcome where issuance of Tier 2 capital cannot be done without the need for more AT1 to be raised to satisfy the floors[53]. Instead, the

[52] These are (i) sum of Irredeemable Non-cumulative Preference Share and Approved Tier 1 <= 30% of Tier 1 Resource, (ii) Approved Tier 1 <= 15% of Tier 1 Resource; (iii) Tier 2 <=Tier 1; and (iv) Qualifying Tier 2 <=50% Tier 1 Resource.

[53] Under the capital framework for banks, such a perverse situation will not arise. For example, as long as the banks satisfy the minimum Tier 1 capital adequacy ratio of 8% of risk weighted assets, issuance of Tier 2 will not affect the Tier 1 ratio.

floors will be set as a percentage of the total risk requirements, excluding the Participating Fund.

5.11 As the financial resources of the Participating Fund (which is primarily made up of the APNGB) is required to meet the total risk requirements of the Participating Fund at all times, it would be reasonable to specify the minimum amount of CET1 and Tier 1 capital in relation to the total risk requirements of the insurance funds excluding the Participating Fund. This is also consistent with the intent of the current regulatory framework for Participating Funds, where the financial resources of the Participating Fund cannot be used to support other insurance funds.

Proposal 36

MAS proposes to introduce the following floors[54] on CET1 and Tier 1 capital:

(a) CET1 capital >= 65% of the Total Risk Requirements (excluding Participating Fund) (only applicable for licensed insurers incorporated in Singapore); and

(b) Tier 1 capital >= 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?

Principal Loss Absorption ("PLA") Feature

5.12 Recent developments in the capital framework for banks have strengthened the loss absorption capacity of capital instrument to be included in Tier 1 regulatory capital. Besides greater capacity to absorb losses, these capital instruments must also have features that clearly enable the instrument to undergo a principal write-down or to be converted into common equity at pre-specified trigger point[55].

5.13 In the first consultation, MAS proposed to incorporate for insurers the PLA feature for Approved Tier 1 resource. Given that PLA feature is useful and relevant for the insurance sector, and that there were no opposing views received during consultation, MAS proposes to introduce this feature in AT1 capital instruments. More details on the definition of the event under which PLA feature will be triggered are given below.

[54] For avoidance of doubt, these will replace the existing Tier 1 and Tier 2 limits under the current RBC framework, i.e. those mentioned in footnote 52.

[55] Please refer to paragraph 6.2.2(m) of MAS 637 for more information on the PLA feature.

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?

Point of Non-Viability ("PONV") Feature

5.14 AT1 and Tier 2 capital instruments under the capital framework for banks are required to contain provisions[56] to ensure that they are capable of absorbing losses at PONV. There is no equivalent feature under the current insurance capital framework, and this feature has not been consulted upon in June 2012. PONV is a relatively new concept amongst insurance jurisdictions[57] globally. However, having such a feature will help to ensure that losses are imposed on holders of such capital instruments at PONV.

5.15 Although it has been proposed that AT1 capital instruments for insurers will also have the PLA feature, this is applicable only for AT1 capital instruments classified as liabilities. In contrast, the PONV feature applies to all non- common equity instruments.

[56] That meet the requirements as set out in Annex 6B of MAS Notice 637
[57] Only APRA has introduced the PONV feature.

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.

Treatment of Negative Reserves

5.16 In the first consultation, MAS proposed to allow part of the negative reserves[58] to be recognised as a form of positive financial resource adjustment, and to consult on the amount to be recognised later.

5.17 MAS' current position of not recognising negative reserves as a form of capital is a conservative one. Given that under RBC 2, an insurer's net asset value will be shocked for the C1 insurance risks at a 1-in-200 year level, it is timely to review this position.

5.18 Whilst most respondents welcomed the idea of recognising negative reserves, there were generally two views on how negative reserves should be treated:

- On balance sheet - Total negative reserves is reflected in the best estimate liabilities, so that a reduced value will be reflected in the policy liabilities (including the PAD). This approach, whilst giving credit to the economic value of the business, might lead to tax-related considerations and yield inconsistencies with the International Financial Reporting Standards 4 ("IFRS 4");

- Off balance sheet - Allowable amount of total negative reserves is not reflected in economic value of business in the best estimate liabilities or in policy liabilities including the PAD. There is no impact on the policy liabilities on the balance sheet. The amount of allowable total negative reserves is an off balance sheet item, as it is only considered in the numerator (i.e.

[58] Regulation 20(4) of the Insurance (Valuation and Capital) Regulations 2004 states that "A registered insurer shall not value the liability in respect of any liability to be less than zero, unless there are moneys due to the insurer when the policy is terminated on valuation date, in which even the value of the liability in respect of that policy may be negative to the extent of the amount due to the insurer." This means that negative reserves are not recognised unless one expects a recovery of monies (for example, surrender penalty in the case of investment-linked policies).

For life business, policy liability is derived policy-by-policy by discounting the best estimate cash flows of future benefit payments, expense payments and receipts, with allowance for provision for adverse deviation. It is possible for the discounted value to be negative when the expected present value of the future receipts (like premium and charges) exceed the expected present value of the future outgo (such as benefit payments and expense payments), resulting in a negative reserve.

Financial Resources) when calculating the CAR. There will be no immediate tax implications.

5.19 Some respondents felt that MAS' original proposal of classifying the amount of allowable negative reserves as a positive financial resource adjustment was contradictory. If MAS had not intended for the negative reserves to be recognised on balance sheet as financial resources (under insurance surplus, a Tier 1 capital component) in the first place, then the adjustment should not be made to the financial resources.

5.20 To avoid any confusion, MAS will classify the amount of allowable negative reserves as a regulatory adjustment[59] instead. This will more accurately reflect that even though insurers are not allowed to recognise negative reserves on balance sheet, MAS is prepared, for purposes of solvency computation, to allow insurers to take some credit for such negative reserves, subject to certain conditions.

5.21 The amount of negative reserves is currently sizeable for some life insurers and some prudence is necessary in deciding on the amount recognised. MAS intends to carefully review the reserving practices and ensure that there is a robust framework for calibrating the level of negative reserves that may be recognised. This is to avoid unintended consequences such as overly optimistic reserving assumptions or excessive pricing margins to inflate the value of negative reserves. MAS will be working with the industry on other enhancements to the existing regulatory requirements and professional guidance notes around valuation.

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.

Proposal 39

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

[59] Banking (MAS Notice 637) has a similar concept of regulatory adjustments.

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?

Treatment of Aggregate of Allowances for Provision for Non-Guaranteed Benefits

5.22 In the first consultation, MAS proposed reclassifying APNGB, where applicable, as a form of positive financial resource adjustment, rather than as one of the components under financial resources, along with Tier 1 and Tier 2 capital. Under the current RBC framework, an insurer maintaining any participating fund is allowed to count as financial resources, the APNGB, subject to the unadjusted capital ratio of the insurer remaining below the adjusted ratio[60].

5.23 Similar to the previous proposal on negative reserves, this proposal was felt by some respondents to be contradictory. If MAS had not intended for APNGB to be recognised explicitly as one of the components of financial resources, then the adjustment should not be made to financial resources. In addition, some respondents asked for a review of the 50% factor, whilst another respondent was of the view that APNGB would be readily available to absorb losses in the participating fund and hence should be recognised as a Tier 1 capital.

5.24 To avoid any confusion, MAS will be classifying APNGB as a regulatory adjustment instead. This will more accurately reflect that even though insurers are required under the valuation rules to explicitly set aside sufficient reserves for the future non-guaranteed bonuses, MAS is prepared, for purposes of solvency computation, to allow insurers to take some credit for the fact that future non-guaranteed bonuses can be cut. Classifying APNGB as a regulatory adjustment also recognises its unique nature, which makes direct comparison with Tier 1 or Tier 2 capital less than straightforward.

5.25 MAS will be retaining the 50% factor for this round of RBC 2 review, as there is no strong basis at this point for refining the current factor. The existing safeguards[61], which will still apply under RBC 2, will help ensure overall prudence in

[60] APNGB, which can be up to 50% of the future non-guaranteed bonuses, is applicable only to insurers who maintain a participating fund. As APNGB is only available to absorb losses of the participating fund, the allowance is adjusted to ensure that the *unadjusted capital ratio* of the insurer is not greater than its *adjusted ratio*.

[61] As set out in First Schedule of the Insurance (Valuation and Capital) Regulations 2004, paragraphs 1(8) and 1(9) still hold.

the approach. For example, insurer is still subject to the condition that the unadjusted capital ratio remains below the adjusted capital ratio.

Reinsurance Adjustment

5.26 Under the current RBC framework, the reinsurance adjustment is calculated as:

A x B x C, where

A= Reinsurance reduction, which is broadly the reduction in the value of liabilities due to reinsurance ceded to the reinsurance counterparty;

B= The reinsurance counterparty factor, which depends on whether the reinsurer is licensed, authorised or a related corporation of the insurer or where the insurer is incorporated outside Singapore, its head office or a branch of its head office or otherwise; and

C = The appropriate risk factor which depends on the credit rating of the reinsurer

5.27 Under RBC 2, it is proposed that references to the licensing status of the reinsurance counterparty will be removed from the reinsurance adjustment formula above (i.e. reinsurance counterparty factor B)[62].

5.28 The current RBC framework also gives recognition to a branch's reinsurance arrangement with its head office as long as there is a written agreement between the branch and the head office. MAS had earlier consulted on a proposal to remove the recognition of the reinsurance arrangement between a head office and its branch in Singapore, regardless of whether there is a written agreement between them. MAS is of the view that reinsurance ceded from a branch to its head office does not result in effective risk transfer since the branch and the head office are considered as a single legal entity.

5.29 MAS notes that it is common for the risks written by the branch in Singapore to be included in the head office's reinsurance arrangements with third party reinsurers. This is also economical for the insurers as most of the branch operations in Singapore are small compared to head office. MAS is prepared to recognise the reinsurance arrangement of a branch included in its head office's reinsurance program regardless of whether the branch has a legal right to receive the recoveries directly from third party reinsurers. However safeguards or conditions should be set to further mitigate the risks of recoveries due to the branch being withheld by the head office.

[62] See Proposal 31 of the consultation paper.

5.30 MAS had also earlier consulted on a proposal to remove the recognition of reinsurance arrangements with downstream entity[63]. This was proposed as such a reinsurance arrangement with a downstream entity would not constitute effective risk transfer since the risk continues to be retained in the consolidated accounts of the insurer. It is noted that the consolidation of reinsurance arrangements within a group by reinsuring with a related downstream subsidiary would usually be done for risk management and tax reasons.

5.31 For similar reasons mentioned in paragraph 5.29, MAS is prepared to give recognition to reinsurance arrangements with downstream related entities in cases the downstream entity reinsures with a third party reinsurer, or has in place other reinsurance arrangements that can result in effective risk transfer out of the group. Again, the necessary safeguards or conditions have to be set to mitigate the risks.

5.32 For the purpose of the QIS, insurers should assume that reinsurance arrangements with (a) head office are not recognised, regardless of written agreement, and (b) downstream entities are not recognised too.

Consultation Question 11

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?

[63] The downstream entity would be limited to that of related entities as defined in the Companies Act (Cap. 50). This would exclude associates and joint ventures. For branch operations in Singapore, this would include subsidiaries of the head office.

6 TREATMENT OF OIF FOR REINSURERS

6.1 The SIF of all licensed reinsurers (whether they are locally incorporated or branches) will continue to be subject to the same RBC requirements as direct insurers. This is to prevent any arbitrage arising from the differential capital treatment for Singapore business between licensed direct insurers and reinsurers. It also helps to ensure that the SIF business of reinsurers is properly capitalised and managed in view of the direct impact that their financial distress will have on the direct insurers that have ceded risks with them.

6.2 As for the OIF, licensed reinsurers are currently subject to either a simplified solvency regime[64] (in the case of locally incorporated reinsurers) or exempted from any capital or solvency requirements altogether (in the case of reinsurance branches). In the first consultation, MAS indicated that the capital treatment of the offshore insurance fund for all reinsurers would be reviewed, and there would be a consultation on the proposals.

Treatment for Reinsurance Branches

6.3 Since the introduction of RBC in 2004, there have been significant improvements in the standards of supervision for reinsurers. Besides the update of the Insurance Core Principles[65], progress has also been made on exchange of information and cooperation between the group-wide and host supervisors. IAIS' ComFRAME initiative will also continue to foster greater harmonisation in the way internationally active insurance groups, such as the major reinsurers which Singapore hosts, are being supervised. A large majority of the licensed reinsurers in Singapore are supervised by reputable group-wide supervisors, and also have in place developed enterprise risk management frameworks. These factors provide some basis for MAS, as host regulator, to rely on the robustness of the capital adequacy requirements placed on, and strength of the home supervision over, head offices of the branches located in Singapore.

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[64] For locally incorporated general reinsurers, the solvency margin for the OIF shall not be less than the greater of:

- S$5 million;
- 10% of net premium income of the fund in the preceding accounting year; or
- 10% of claim liabilities[64] of the fund as at the end of the preceding accounting year.

Locally incorporated life reinsurers are required to maintain a solvency margin of at least:

- S$5 million; or
- 10% of reserves calculated according to the Insurance (Valuation and Capital) Regulations.

[65] ICP 23 on Group Wide Supervision

6.4 MAS also recognises that imposing capital for the OIF business of reinsurance branches could impede the ability of these reinsurers to move capital swiftly to meet large and unexpected claims. In view of the above, MAS proposes to continue to exempt the OIF of licensed reinsurance branches from the solvency requirements.

6.5 Nevertheless, MAS notes that non-life property reinsurance make up a significant proportion of OIF business for reinsurance branches[66]. In the event of a natural catastrophe in the region, there could be adverse impact on the solvency position of these reinsurers, particularly if they write a large portfolio of such risks. Reinsurers are already required to do an Own Risk and Solvency Assessment ("ORSA") under the ERM framework, starting 1 January 2014. MAS will further explore introducing an industry-wide stress test for licensed reinsurers in Singapore, covering various insurance-related scenarios. MAS will monitor the standards of the reinsurance branches' ORSA and stress testing results to ensure that catastrophe risks are properly managed.

6.6 MAS will also monitor closely developments at the head offices of reinsurers to assess risks to the viability of the reinsurers and require prompt remedial actions where necessary. MAS reserves the power to impose other compensating prudential requirements on the OIF of reinsurers that MAS has concerns with.

Proposal 40

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

Treatment for Locally Incorporated Reinsurers

6.7 Whilst a distinction was made between locally incorporated reinsurers and reinsurance branches in the last policy review, MAS is of the view that further distinction should be made between locally-owned and foreign-owned locally incorporated reinsurers.

6.8 Regardless whether reinsurers carry out their global operations as subsidiaries or branches, it would be beneficial if the regulatory capital regime allows them to deploy capital freely to meet catastrophic losses. Foreign-owned locally incorporated reinsurers would also be typically subject to group-wide supervision, with a group-wide supervisor and group capital requirements.

6.9 However, compared to a branch, a foreign-owned locally incorporated reinsurer is a separate legal entity over which MAS has a greater degree of

[66] Based on audited annual returns for year 2012, Life and Non-life Property reinsurance makes up about 88% of foreign-incorporated reinsurers' OIF business.

supervisory responsibility. In view of this, 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 41

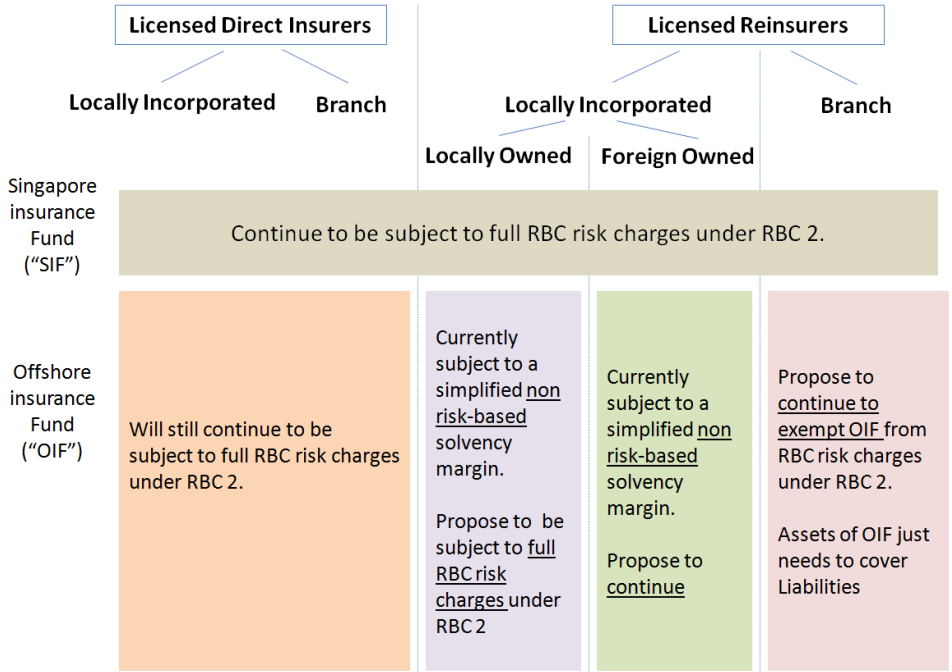
MAS proposes to continue to subject the OIF business of foreign-owned locally incorporated reinsurers to the current simplified solvency requirement (i.e. remain status quo).

6.10 In the case of locally-owned locally incorporated reinsurer, MAS has oversight responsibility as the home regulator. The failure of such entities also poses a greater reputation risk to Singapore's financial sector. Therefore, MAS proposes that the OIF of locally-owned locally incorporated reinsurers be subject to full RBC 2 requirements. Locally-owned locally incorporated reinsurers will generally not be subject to an unlevel playing field as most of their global reinsurance counterparts will similarly be subject to group-wide supervision, including group capital requirements. Further, with on-going efforts towards convergence of group-wide supervisory practices, any disparity in standards will reduce over time.

Proposal 42

MAS proposes that the OIF of locally-owned locally incorporated reinsurer be subject to full RBC2 requirements. Appropriate transitional arrangements will be provided for affected reinsurers.

6.11 The following diagram summarises the proposed changes.



7 QUANTITATIVE IMPACT STUDY

7.1 The detailed technical specifications for QIS 1 can be found in Annex D. The QIS has been designed to gather information to help evaluate the impact of the RBC 2 proposals.

7.2 All insurers (with the exception of captives, Lloyd's insurers and marine mutuals) will be required to conduct QIS 1. This will allow the insurers to understand the impact of RBC 2 proposals on their capital positions, as well as give them an opportunity to highlight any implementation issues experienced in conducting QIS 1.

7.3 The projections under QIS 1 will be based on the valuation date of 31 December 2013. In order to assess the impact of the proposals presented, insurers are required to provide the results for the following scenarios[67] in the Excel workbook provided within Annex D:

- Scenario 1: Insurers will be required to incorporate all RBC 2 proposals with the exception of the Matching Adjustment;
- Scenario 2: Insurers will be required to incorporate all RBC 2 proposals with the exception of the Matching Adjustment. In addition, insurers should assume that there is no LTRFDR, and that the 30-year SGS yield is used for liabilities of duration 30 years and beyond;
- Scenario 3: Insurers will be required to incorporate all RBC 2 proposals, including the Matching Adjustment for the life business if the criteria set out in the MA proposal can be satisfied.

7.4 The completed Excel workbook (enclosed within Annex D) are to be submitted[68] to MAS no later than 30 May 2014, with the exception of results for Scenario 3, where insurers can submit their results later, by 30 Jun 2014. Insurers can direct all queries relating to QIS 1 to QIS_1@mas.gov.sg

Consultation Question 12

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

[67] A direct general insurer or general reinsurer that chooses not to discount its liabilities because the impact is immaterial would just need to do Scenario 1. Direct life insurers and life reinsurers would at a minimum, need to do both Scenarios 1 and 2. If they write participating and non-participating businesses, Scenario 3 would be applicable as well.

[68] With the necessary encryption as specified in Annex D.

8 PROPOSED TIMELINE AND TRANSITIONAL PROVISIONS

8.1 Following the review of the second consultation feedback and QIS 1 results, there will be a third consultation on RBC 2 Review, including the revised technical specifications for QIS 2. MAS will also be consulting on the relevant legislative changes (e.g. changes to the Insurance (Valuation and Capital) Regulations 2004, Insurance (Account and Statements) Regulations 2004, introduction of new Notice to set out the detailed RBC 2 requirements).

8.2 MAS expects to finalise the calibration factors and features of the RBC 2 framework by 2014, and implement the RBC 2 requirements (with the exception of the general insurance catastrophe risk requirement and the revised C1 risk requirements for general business, which will be implemented later) from 1 January 2017. Work on the internal model approach will be commenced after the implementation of RBC 2.

8.3 MAS will incorporate transitional provisions where applicable. Other than the transitional arrangements for the risk free discount rate, transitional provisions may be required for proposals such as the derecognition of reinsurance arrangements with head office and group capital requirements on RBC 2 basis. MAS will be seeking industry views on the implementation 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?

Annex A

CONDITIONS TO BE MET FOR APPLYING MATCHING ADJUSTMENT

Eligible Assets

I. The following assets are eligible:

- Singapore Government Securities ("SGS") or Singapore Dollar ("SGD") corporate bonds of investment grade quality[69];
- United States Treasury Securities ("UST") or United States Dollar ("USD") corporate bonds of investment grade quality;
- Cash denominated in SGD or USD;

II. 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;

III. Eligible assets are to be explicitly identified and managed separately from the other assets in the Insurance fund. This is to ensure that these assets which are held specifically to back the predictable liabilities are not exposed to the risk of forced sale to support other liabilities;

Eligible products

IV. Products denominated in SGD or USD will be eligible[70] for the MA. These two currencies currently constitute 99% of the insurance policies. The ability of the asset cash flows to meet liability cash flows without requiring any unexpected liquidation of existing assets is a key element of the MA mechanism; it is therefore crucial for the liability cash flows to exhibit a high degree of predictability. All life products[71] with immaterial risk exposure to mortality, lapse, disability, dread disease and other insured events are eligible. Immateriality will be evaluated based on tests which measure the change in the best estimate

[69] Singapore Dollar debt securities issued by Singapore Statutory Board are also allowed to be recognised as an eligible asset, and for the purposes of the Matching Adjustment mechanism, be treated as having a "AAA" credit rating.

[70] Products in SGD must be matched with SGD assets. Similarly, products in USD can only be matched with USD assets.

[71] For avoidance of doubt, products in the investment-linked fund and general insurance fund are to be excluded.

liabilities[72] after applying specified insurance shocks[73] 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[74] in best estimate liabilities from the shocks must not be more than 20%. For participating products, the materiality test is to be applied on the liabilities[75] for guaranteed benefits;

V. The best estimate liabilities for the eligible products should be net of reinsurance ceded;

Constraints on extent of cash flow mismatching

VI. 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[76] is allowed;

Others

VII. The MA is the spread of the weighted average yield-to-maturity ("YTM") of the asset portfolio over the average risk-free liability discount rate, less the spread for default and downgrade:

- The spread over the risk-free rate is determined as the additional single spread that accounts for the difference in value between the matched asset portfolio and liability portfolio;
- The spread for default and downgrade will be prescribed by MAS and captures the cost of default and the cost associated with maintaining the credit quality of the asset portfolio should a downgrade occur;
- The weights to be used should correspond to the market value of the bonds;

VIII. To the extent that the yields for BBB assets compared to that for higher rated assets may provide an incentive for insurers to invest in more risky assets, we

[72] Determined in accordance with the Insurance (Valuation and Capital) Regulations 2004 for a non-participating policy, and before the application of the PAD. Negative best estimate liabilities are allowed.

[73] These would be the same shocks used in determining the capital requirements under the C1 risk module.

[74] Decreases in the best estimate liabilities are allowed and will not be subject to the threshold for the materiality test. In order to calculate the total increase from the specified shocks, the increase in liabilities should be calculated for each shock individually and combined using the same correlation matrix prescribed under the C1 risk calculations

[75] i.e. the minimum condition liability, but before the inclusions of PAD and floor of zero for each policy.

[76] Determined based on the sum of the present value of the shortfall (excess of liability cash flows over asset cash flows), if any, in each future year using risk-free rates.

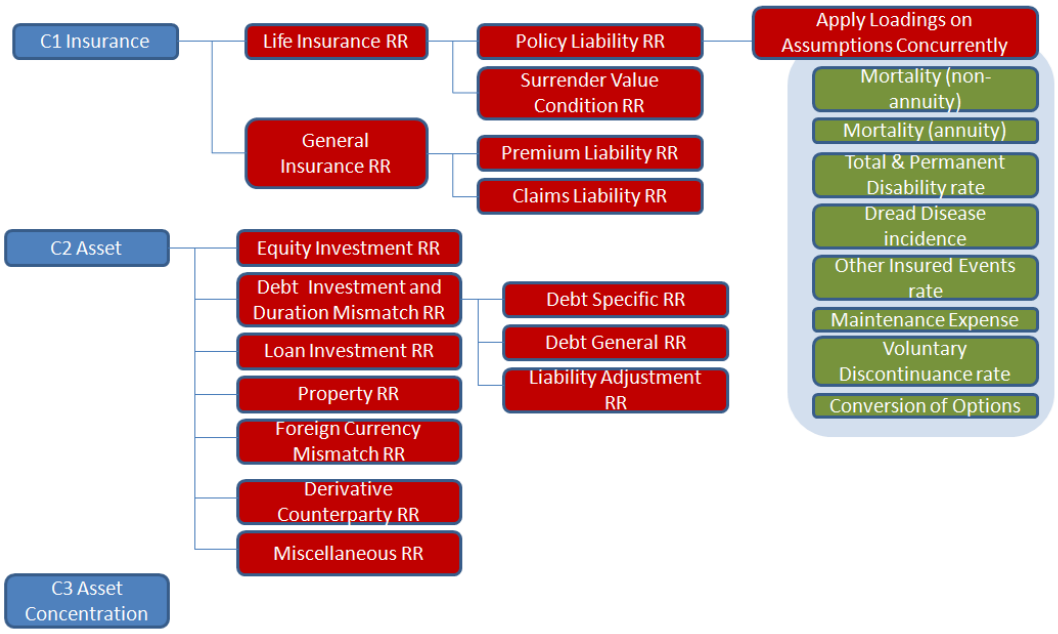
will constrain the spread for BBB assets to the highest of the calculated assets for AAA, AA and A rated assets; and

IX. No "cherry picking", i.e. insurers that choose to apply the MA to a portfolio of eligible products will not be allowed to revert to the approach that does not include the MA. Where an insurer that applies the MA finds that it is no longer able to comply with the conditions stated above, it should take the necessary steps to restore compliance within a period of three months. Beyond that period, it shall cease applying the MA and will only be allowed to apply the MA again after a period of 24 months.

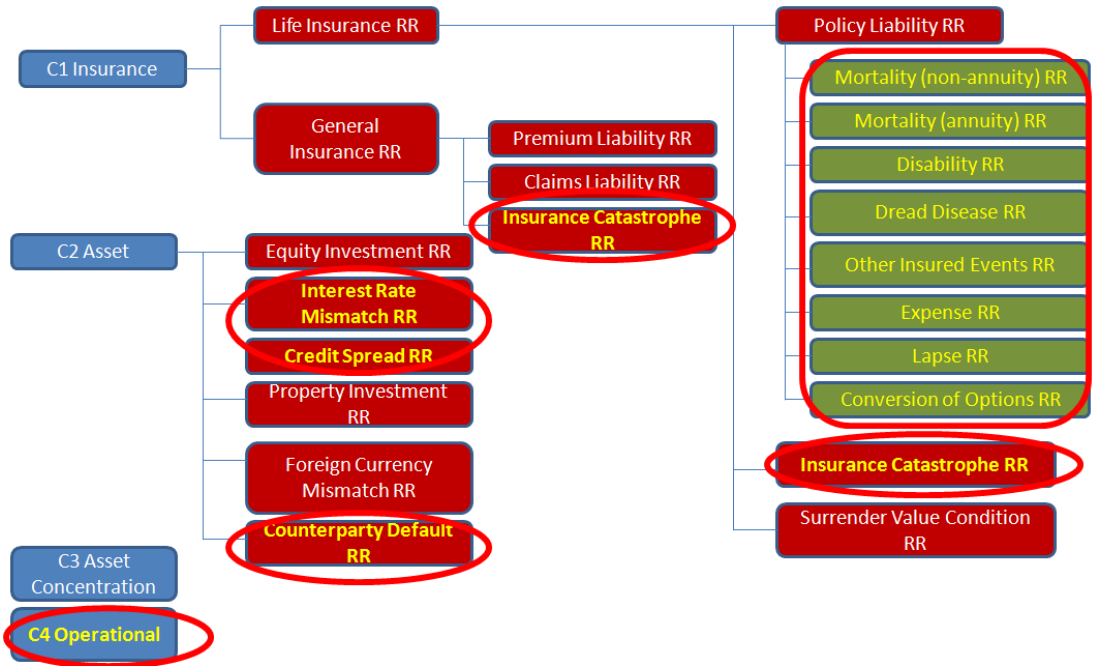
Annex B

PROPOSED REORGANISATION OF RISK MODULES UNDER RBC 2

Current RBC:



Proposed Changes under RBC 2:



Annex C

DEFINITIONS OF TIER 1 AND TIER 2 CAPITAL UNDER RBC 2

1. Tier 1 Capital

"Tier 1 capital" of a licensed insurer shall be the sum of the following items:

a) the aggregate of the surpluses of the assets over the liabilities of all insurance funds (other than a participating fund) established and maintained under the Act by the insurer;

b) the balance in the surplus account of each participating fund;

c) where it is a licensed insurer incorporated in Singapore, the sum of –

i. its paid-up ordinary share capital;

ii. surpluses of overseas branch operations

iii. retained earnings; and

iv. AT1 capital; and

less

d) the aggregate of the reinsurance adjustments of all insurance funds established and maintained under the Act by the insurer and any financial resource adjustment.

For a licensed insurer incorporated in Singapore, CET1 capital shall be taken to be Tier 1 capital less AT1 capital.

"AT1 capital" shall be the sum of the capital instruments issued by the insurer that comply with the requirements in Section 3.

2. Tier 2 Capital

"Tier 2 capital" of a licensed insurer incorporated in Singapore shall be the sum of the capital instruments issued by the insurer that comply with the requirements in Section 4.

3. Minimum Requirements for AT1 Capital Instruments

A capital instrument of the insurer shall not qualify for inclusion as AT1 capital unless –

a) the instrument is issued and fully paid-up in cash, whereby only the net proceeds received from the issuance of instruments shall be included as financial resources of the insurer;

b) the holder of the instrument has a priority of claim, in respect of the principal and interest of the instrument in the event of a winding up of the insurer, which is lower than that of policy owners, other creditors of the insurer and holders of qualifying Tier 2 instruments, except where such persons rank equally with, or behind the holder of the instrument;

c) the paid-up amount is not secured or covered by a guarantee of the insurer or any of its related corporations or other affiliates, or any other arrangement, that legally or economically enhances the priority of the claim of any holder of the instrument vis-a-vis the persons set out in sub-paragraph (b);

d) the holder of the instrument waives its right, if any, to set off any amounts he owes the insurer against any subordinated amount owed to him due to the instrument and commits to return any set-off amounts or benefits received to the liquidator;

e) the subordination provisions of the instrument are governed by the laws of Singapore. Where the capital instrument is to be subject to the laws of a jurisdiction other than Singapore, the insurer shall satisfy itself that all the relevant conditions specified in this paragraph are met under the laws of that jurisdiction;

f) the principal is perpetual. In this regard, there shall be no maturity date, and there shall be no step-ups or other provisions that mandate or create an incentive for the insurer to redeem the capital instrument[77];

[77] For example, the following shall be considered as an incentive to redeem:

(a) a call option combined with an increase in the credit spread of the capital instrument if the call option is not exercised;

(b) a call option combined with a requirement or an investor option to convert the capital instrument into ordinary shares if the call is not exercised; or

(c) a call option combined with a change in reference rate where the credit spread over the second reference rate is greater than the initial payment rate less the swap rate (i.e. the fixed rate paid to the call date to receive the second reference rate).

For the avoidance of doubt, a conversion from a fixed rate to a floating rate or vice versa in combination with a call option without any increase in credit spread shall not in itself be deemed an

g) the capital instrument is callable at the option of the insurer only after a minimum of five years from the issue date[78], subject to the following requirements -

i. A call option may be exercised only with the prior approval of MAS

ii. The insurer shall not create an expectation that the call option will be exercised[79]; and

iii. The insurer shall not exercise a call option unless -

(A) The instrument is replaced by the insurer with capital of the same or better quality, and the replacement of this capital is done at conditions which are sustainable for the income capacity of the insurer[80]; or

(B) The insurer demonstrates that its capital position is well above the minimum requirements after the call option is exercised

h) any repayment of principal (e.g. through repurchases or redemptions) is done only with the prior approval of MAS. The insurer shall not assume or create expectations that approval will be given by MAS. Without prejudice to any other matter that MAS may consider relevant, MAS shall, in determining whether to grant its approval, consider whether the insurer's capital position is likely to remain adequate after redemption;

i) With regard to the dividend or coupon on the instrument,

incentive to redeem. The insurer shall, however, not do anything to create an expectation that the call will be exercised.

[78] MAS is not likely to grant approval for redemption within the first five years from the issue date except where–

(a) there is a change in tax status of the capital instrument due to changes in applicable tax laws of the country or territory in which the capital instrument was issued; or

(b) there is a change relating to the recognition of the capital instrument as an AT1 capital instrument.

MAS shall, in determining whether to grant approval, consider whether the insurer was in a position to anticipate the event at issuance.

[79] For example, MAS is not likely to grant approval for redemption where an insurer calls a capital instrument and replaces it with another capital instrument that is more costly (e.g. with a higher credit spread).

[80] Replacement issues can be concurrent with, but not after the capital instrument is called.

i. The insurer has full discretion at all times to cancel distributions or payments[81];

ii. any cancellation of dividend or coupon is not an event of default;

iii. the insurer has full access to cancelled payments to meet obligations as they fall due; and

iv. any cancellation of dividend or coupon does not impose restrictions on the insurer, except in relation to distributions to ordinary shareholders

j) any dividend or coupon to be paid under the instrument is only paid to the extent that the insurer has profits distributable under any written law, determined from the latest statements of account lodged with MAS in accordance with section 36 of the Act or such other subsequent audited statements of account provided to the MAS;

k) the instrument does not have a credit sensitive dividend feature. In this regard, the capital instrument shall not have a dividend or coupon that is reset periodically, based in whole or in part on the credit standing of the insurer or any insurance group entity;

l) the instrument does not contribute to liabilities exceeding assets, if such a balance sheet test forms part of any national insolvency law governing the provisions of the instrument;

m) where the instrument is classified as a liability under the Accounting Standards, it shall have principal loss absorption features[82] through –

i. a provision under which it converts to ordinary shares if the CET1 Capital of the insurer falls below 70% of the total risk requirements (excluding participating funds); or

ii. a write-down mechanism that allocates losses to the capital instrument if the CET1 capital of the insurer falls below 70% of

[81] In this regard, "dividend pushers" are prohibited. A capital instrument with a dividend pusher obliges the insurer to make a dividend or coupon payment on the instrument, if it has made a payment on another (typically more junior) capital instrument or share. This obligation is inconsistent with the requirement for the insurer to have full discretion at all times to cancel distributions or payments.

Furthermore, the cancellation of distributions or payments means that these payments are extinguished; it does not permit features that require the insurer to make distributions or payments in kind. For the avoidance of doubt, "dividend stoppers" are not prohibited, provided that the insurer retains full discretion at all times to cancel distributions or payments. A capital instrument with a dividend stopper stops the insurer from making a dividend on its ordinary shares or other AT1 capital instruments if a dividend or coupon payment is not paid on its AT1 capital instruments.

[82] The principal loss absorption need not be triggered if the insurer is able to maintain a CET1 capital of 70% or more via other means.

the total risk requirements (excluding participating funds). The write-down shall have the following effects:

(A) it reduces the claim of the instrument in liquidation of the insurer;

(B) it reduces the amount to be repaid when a call option is exercised; and

(C) it partially or fully reduces dividend or coupon payments on the instrument;

Under both sub-paragraphs (i) and (ii) above, the conversion or write-down shall generate CET1 Capital.

In addition, the aggregate amount to be converted or written down[83] for all such instruments shall be at least the amount needed to immediately return the insurer's CET1 Capital to 70% of the total risk requirements (excluding participating funds) or, if this is not possible, the full principal value of the instruments;

n) where an insurer issues the instrument in a foreign currency, the instrument shall be revalued periodically (at least monthly) in terms of Singapore dollars at the prevailing exchange rates. Where the insurer intends to use a swap to hedge the foreign exchange exposure arising from the foreign currency instrument, it shall consult MAS on the capital treatment applicable to the hedge prior to such use;

o) neither the insurer nor any of its insurance group entities or associates can have purchased the instrument, nor can the insurer have directly or indirectly funded the purchase of capital instrument;

p) the instrument does not have any feature that hinders recapitalisation, such as provisions that require the issuer to compensate investors if a new instrument is issued at a lower price during a specified time frame[84];

q) if the instrument is not issued out of an operating entity or the holding company of the insurer (e.g. issued out of a SPE), the proceeds from the

[83] The instrument cannot be written back up even if there are profits in the future.

[84] Where there is a dividend stopper within the terms and conditions of the AT1 capital instrument, such a feature shall not hinder the recapitalisation of the insurer. For example, a dividend stopper on an AT1 capital instrument shall not (a) attempt to stop payment on another capital instrument where such payments are not fully discretionary; (b) prevent distributions to ordinary shareholders for a period that extends beyond the point in time that dividend or coupon payments on the AT1 capital instrument are resumed; or (c) impede the normal operation of the insurer or any restructuring activity such as acquisitions or disposals.

issuance of the instrument shall be immediately available without limitation to an operating entity or the holding company of the insurer in a form which meets or exceeds all of the other requirements set out in this paragraph, for inclusion in AT1 Capital;

r) the main features of the instruments, are disclosed accurately and in a manner that is easily understood by an investor;

s) the agreement governing the issuance of the instrument cannot be amended or varied without the prior approval of MAS where such proposed changes could impact its eligibility as AT1 Capital;

t) *the terms and conditions of the instrument contain provisions which ensure its loss absorbency at the point of non-viability (relevant only if this feature were to be incorporated).*

4. Minimum Requirements for Tier 2 Capital Instruments

A capital instrument of the insurer shall not qualify for inclusion as Tier 2 capital unless–

a) the instrument is issued and fully paid-up in cash, whereby only the net proceeds received from the issuance of instruments shall be included as financial resources of the insurer;

b) the holder of the instrument has a priority of claim in respect of the principal and interest of the instrument, in the event of a winding up of the insurer, which is lower than that of policy owners and other creditors of the insurer, except where such persons rank equally with, or behind, the holder of the instrument ;

c) The paid-up amount is not secured or covered by a guarantee of the insurer or any of its related corporations or other affiliates, or any other arrangement, that legally or economically enhances the priority of the claim of any holder of the instrument vis-a-vis the persons set out in sub-paragraph (b);

d) the holder of the instrument waives its right, if any, to set off any amounts he owes the insurer against any subordinated amount owed to him due to the instrument and commits to return any set-off amounts or benefits received to the liquidator;

e) the subordination provisions of the instrument are governed by the laws of Singapore. Where the capital instrument is to be subject to the laws of a jurisdiction other than Singapore, the insurer shall satisfy itself that all

the relevant conditions specified in this paragraph are met under the laws of that jurisdiction

f) with regard to the maturity of the capital instrument:

i. the instrument has a minimum original maturity of at least 5 years. Where the agreement governing the issuance of the capital instrument provides for the loan to be drawn down in a series of tranches, the minimum original maturity for each tranche shall be 5 years from the date of its draw-down;

ii. recognition of the instrument in Tier 2 Capital in its final five years to maturity is amortised on a straight-line basis by 20% per annum in accordance with the table immediately below. Where the capital instrument is repayable in separate tranches, each tranche shall be amortised individually, as if it were a separate loan; and

Table 1: Amortisation Schedule for a Tier 2 capital instrument

Years to maturity (x)	Amortised amount eligible to be included in Tier 2 Capital
x > 4	100%
3 < x ≤4	80%
2 < x ≤ 3	60%
1 < x ≤ 2	40%
x ≤ 1	20%

iii. there are no step-ups or other provisions that mandate or create an incentive for the insurer to redeem the capital instrument[77].

g) the capital instrument is callable at the option of the insurer only after a minimum of five years from the issue date[85], subject to the following requirements -

[85] MAS is not likely to grant approval for redemption within the first five years from the issue date except where–

(a) there is a change in tax status of the capital instrument due to changes in applicable tax laws of the country or territory in which the capital instrument was issued; or

(b) there is a change relating to the recognition of the capital instrument as capital for calculating Total CAR, and provided that the requirements set out in this sub-paragraph are met. MAS shall, in determining whether to grant approval, consider whether the insurer was in a position to anticipate the event at issuance.

i. A call option may be exercised only with the prior approval of MAS;
ii. The insurer shall not create an expectation that the call option will be exercised[79, 86];
iii. The insurer shall not exercise a call option unless -

(A) The instrument is replaced by the insurer with capital of the same or better quality, and the replacement of this capital is done at conditions which are sustainable for the income capacity of the insurer; or

(B) The insurer demonstrates that its capital position is well above the minimum capital requirements after the call option is exercised

h) the holder of the capital instrument has no rights to accelerate the repayment of future scheduled payments (either coupon or principal), except in a bankruptcy or liquidation of the insurer;

i) the instrument does not have a credit sensitive dividend feature. In this regard, the capital instrument shall not have a dividend or coupon that is reset periodically, based in whole or in part on the credit standing of the insurer or any insurance group entity;

j) where the insurer issues the instrument in a foreign currency, the instrument shall be revalued periodically (at least monthly) in terms of Singapore dollars at the prevailing exchange rates. Where the insurer intends to use a swap to hedge the foreign exchange exposure arising from the foreign currency instrument, it shall consult MAS on the capital treatment applicable to the hedge prior to such use;

k) neither the insurer nor any of its insurance group entities or associates can have purchased the instrument, nor can the insurer have directly or indirectly funded the purchase of capital instrument;

l) if the instrument is not issued out of an operating entity or the holding company of the insurer (e.g. issued out of a SPE), the proceeds from the issuance of the instrument shall be immediately available without limitation to an operating entity or the holding company of the insurer in a form which meets or exceeds all of the other requirements set out in this paragraph, for inclusion in Tier 2 Capital;

[86] Where this requirement is met, an option to call the capital instrument after five years but prior to the start of the amortisation period will not be deemed an incentive to redeem.

m) the main features of the instruments, are disclosed accurately and in a manner that is easily understood by an investor;

n) the agreement governing the issuance of the instrument cannot be amended or varied without the prior approval of MAS where such proposed changes could impact its eligibility as Tier 2 Capital;

o) *the terms and conditions of the instrument contain provisions which ensure its loss absorbency at the point of non-viability (relevant only if this feature were to be incorporated).*

5. Transitional Arrangements

Capital instruments that have been approved by MAS that do not meet, in full, the requirements set out in -

a) Section 3 (for a Tier 1 resource approved under Paragraph 1(2)(c)(iv) of the First Schedule of the Insurance (Valuation and Capital) Regulations 2004) ;or

b) Section 4 (for a qualifying Tier 2 instrument approved under Paragraph 1(4)(b) of the First Schedule of the Insurance (Valuation and Capital) Regulations 2004)

shall be phased out from *[RBC 2 Full Implementation Date].* Fixing the base at the nominal amount of such instruments outstanding[87] on *[RBC 2 Full Implementation Date]*[88], their recognition shall be capped at 90% with effect from *[RBC 2 Full Implementation Date]*, with the cap reducing by 10 percentage points in each subsequent year.

[87] The base shall reflect the outstanding amount that is eligible to be included in the relevant tiers of capital under the *[relevant regulations/notices]*. In this regard, to the extent that a Tier 2 capital instrument has begun to amortise before *[RBC 2 Full Implementation Date]*, the base shall take into account the amount after amortisation and not the full nominal amount. For the avoidance of doubt, individual Tier 2 capital instruments that are subject to amortisation requirements shall continue to be amortised by 20 percentage points in each subsequent year.

[88] Capital instruments denominated in a foreign currency shall be included in the base, using their values in the reporting currency of the insurer as at *[RBC 2 Full Implementation Date]*. The base will therefore be fixed in the reporting currency of the insurer throughout the transition period. At each subsequent reporting date, such capital instruments shall be valued as they are reported on the balance sheet of the insurer (adjusting for any amortisation in the case of a Tier 2 capital instrument), and be subject to the relevant caps throughout the transition period.

Annex D

TECHNICAL SPECIFICATIONS FOR QIS

Annex D_Technical Specs for QIS1.pdf

Monetary Authority of Singapore