

CONSULTATION PAPER

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RBC 2 Review – Third Consultation

MAS

Monetary Authority of Singapore

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Acronyms

A&H	Accident & Health
APNGB	Allowance for Provision for Non-Guaranteed Benefits
AT1 Capital	Additional Tier 1 Capital
BEL	Best Estimate Liabilities
C1 Requirements	Component 1 Requirements
C2 Requirements	Component 2 Requirements
C3 Requirements	Component 3 Requirements
C4 Requirements	Component 4 Requirements
CAR	Capital Adequacy Ratio
CCA	Countercyclical Adjustment
CET1	Core Equity Tier 1
CIS	Collective Investment Schemes
EIOPA	European Insurance and Occupational Pensions Authority
ERM	Enterprise Risk Management
FSR	Fund Solvency Ratio
IAIS	International Association of Insurance Supervisors
ICPs	Insurance Core Principles
IP	Illiquidity Premium
LIA	Life Insurance Association of Singapore
LLP	Last Liquid Point
LTRFDR	Long-Term Risk-Free Discount Rate
MA	Matching Adjustment
MCL	Minimum Condition Liabilities
MCR	Minimum Capital Requirement
NLG	No-Lapse Guarantee
Non-Par	Non-Participating
OECD	Organisation for Economic Cooperation and Development
OIF	Offshore Insurance Fund
ORSA	Own Risk and Solvency Assessment
PAD	Provision for Adverse Deviations
Par	Participating
PCR	Prescribed Capital Requirement
PONV	Point of Non-Viability
PLA	Principal Loss Absorption

QIS	Quantitative Impact Study
RBC	Risk-Based Capital
SAS	Singapore Actuarial Society
SGS	Singapore Government Securities
SIF	Singapore Insurance Fund
SV	Surrender Value
TRR	Total Risk Requirements
tVaR	Tail Value at Risk
UFR	Ultimate Forward Rate
UL	Universal life
VaR	Value at Risk

1 Preface

1.1 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 and the industry is well capitalised, there is a need to review the framework to enhance its risk sensitivity and coverage. This is pertinent in light of evolving market practices and global regulatory developments.

1.2 This consultation paper sets out the revised proposals, taking into account the feedback received from the second consultation paper on MAS' review of the RBC framework ("RBC 2") in 2014¹, as well as the subsequent engagements MAS had with the industry. It contains detailed technical specifications for insurers to conduct the second full scope Quantitative Impact Study ("QIS 2"). Participating in QIS 2 will help insurers fully understand the impact of the revised RBC 2 proposals and provide feedback on implementation issues.

1.3 MAS invites comments from the insurance industry and other interested parties.

Please note that all submissions received will be published and attributed to the respective respondents unless they expressly request MAS not to do so. As such, if respondents would like (i) their whole submission or part of it, or (ii) their identity, or both, to be kept confidential, please expressly state so in the submission to MAS. In addition, MAS reserves the right not to publish any submission received where MAS considers it not in the public interest to do so, such as where the submission appears to be libellous or offensive.

¹ Review on Risk-Based Capital Framework for Insurers in Singapore ("RBC 2 Review") – Second Consultation, 6 August 2014. The consult paper can be accessed at <http://www.mas.gov.sg/News-and-Publications/Consultation-Paper/2014/RBC-2-Review-Second-Consultation.aspx>.

1.4 Please submit comments by **20 October 2016** to:

Insurance Department
Monetary Authority of Singapore
10 Shenton Way, MAS Building
Singapore 079117
Fax: (65) 62203973
Email: RBC2con@mas.gov.sg

1.5 Electronic submission is encouraged. We would appreciate that you use this suggested format [[link to consultation feedback submission document](#)] for your submission to ease our collation efforts.

1.6 Queries relating to QIS 2 can be sent to QIS_2@mas.gov.sg.

2 Background

Drivers and considerations behind RBC 2 Review

2.1 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 requirements prescribed under the framework serve 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.

2.2 While the current RBC framework has been effective, there is a need to update the framework (“RBC 2 review”) to enhance its risk sensitivity and coverage in light of evolving market developments. The RBC 2 review will also help to ensure that our framework is in line with international standards and best practices.

2.3 Insurers in Singapore are well-capitalised. The objective of RBC 2 is therefore not to raise the industry’s overall regulatory capital requirements, but to ensure that the framework for assessing capital adequacy is more aligned to an insurer’s business activities and risk profiles.

2.4 The key objectives of the RBC 2 review are:

- a) Enhance policyholder protection;
- b) Observe international standards and best practices; and
- c) Ensure insurers can perform its economic and social role on a sustainable basis.

2.5 The first consultation paper on the roadmap of the RBC 2 review was issued in June 2012 (“first consultation”)². The second consultation paper on RBC 2 review was issued in March 2014 (“second consultation”). It set out specific proposals, including the proposed calibrated risk factors and a matching adjustment feature for life business. The second consultation paper also contained detailed technical specifications which

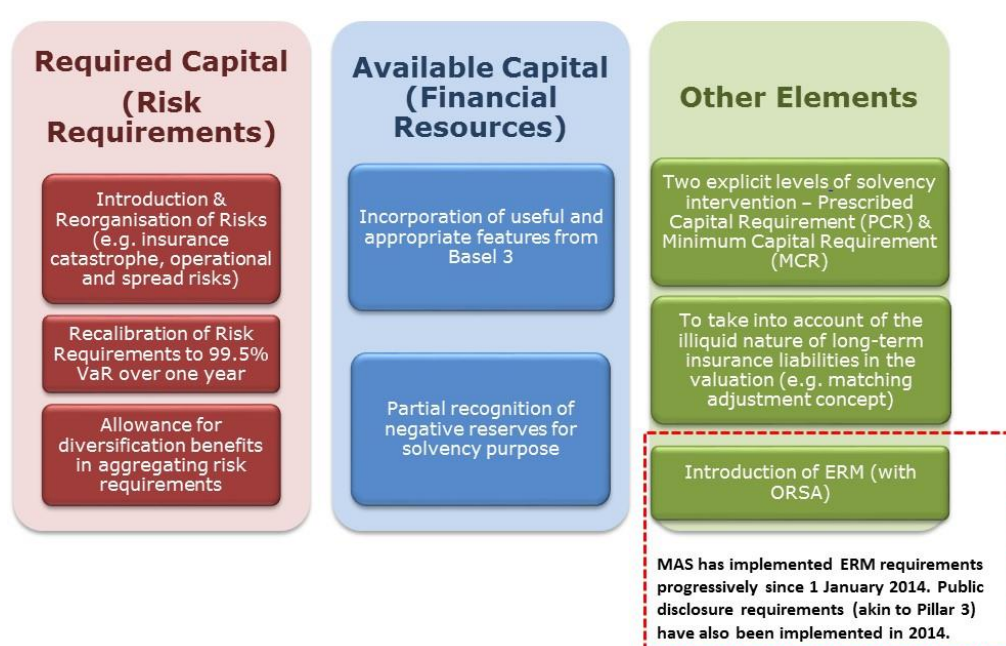
² Review on Risk-Based Capital Framework for Insurers in Singapore (“RBC 2 Review”), 22 June 2012: The consult paper can be accessed at <http://www.mas.gov.sg/News-and-Publications/Consultation-Paper/2012/Consultation-Paper-on-Review-on-Risk-Based-Capital-Framework-for-Insurers-in-Singapore-RBC-2-Review.aspx>.

allowed insurers to conduct the first comprehensive QIS (“QIS 1”), which enabled MAS to assess the impact of RBC 2.

Key features of RBC 2

2.6 The RBC 2 review broadly comprises the following components as shown in Diagram 1. The proposal to introduce Enterprise Risk Management (“ERM”), with the Own Risk and Solvency Assessment (“ORSA”), has since been implemented progressively from 1 January 2014. Public disclosure requirements have also been introduced in 2014.

Diagram 1: Key components under RBC 2



2.7 The key proposals under the second consultation are summarised below:

- Calibration of risk requirements to an overall target criterion i.e. Value at Risk (“VaR”) measure of 99.5% confidence level over a one year period. This is to ensure that an insurer holds, to a high level of certainty, sufficient capital to buffer against losses;
- Introduction of new risks (such as insurance catastrophe and operational risk requirements) and reorganisation of existing risks to enhance the framework’s comprehensiveness and risk sensitivity;
- Introduction of two explicit solvency intervention levels, Prescribed Capital Requirement (“PCR”) and Minimum Capital Requirement (“MCR”) at both company and insurance fund level. This will help to provide greater clarity to insurers on MAS’ expectations;

- d) Introduction of a matching adjustment for life insurers as a more targeted approach to address the issue of short-term volatility due to differences in discounting of assets and liabilities;
- e) Alignment with banking capital framework for consistency where relevant and useful; and
- f) Unlocking of conservatism in certain areas of the RBC framework, such as allowing for diversification benefits in aggregating risk requirements and recognising negative reserves³ for solvency purposes.

Key consultation feedback

2.8 The consultation feedback, MAS' responses and revised proposals are set out within the respective sections of this consultation paper. The list of respondents can be found in **Annex B**.

2.9 The key consultation feedback received from the different types of market players are shown in Diagrams 2 to 4.

³ 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 premiums and charges) exceed the expected present value of the future outgo (such as benefit payments and expense payments), resulting in a negative reserve.

MAS currently does not allow the liability of any policy to be less than zero, unless one expects a recovery of monies (for example, surrender penalty in the case of investment-linked policies or recapture fees for reinsurers).

**Diagram 2: Direct life and composite insurance industry –
Summary of key consultation feedback**

1. Provide greater clarity on MAS' expectations in relation to additional buffer that insurers would have to maintain, including supervisory capital add-ons or high impact surcharge, above PCR.
2. Allow greater recognition of diversification benefits between Component 1 ("C1") (insurance), Component 2 ("C2") (asset) and Component 4 ("C4") (operational) risk requirements, and between insurance/shareholder funds. Explicit correlation matrix preferred for transparency.
3. Allow greater recognition of negative reserves to count towards Financial Resources.
4. Risk charges for some C2 (e.g. equity, credit spread & counterparty default for unrated corporates) and C4 requirements are too conservative.
5. Welcomed concept of MA but found eligibility criteria too stringent. Prefer a more generic illiquidity premium to be applied to the discount rate as well.

**Diagram 3: Direct general insurance industry –
Summary of key consultation feedback**

1. Allow use of simpler approach (e.g. modified duration) to compute interest rate mismatch and credit spread risk requirements
2. Allow diversification benefits between life and non-life business and explicit correlation matrix preferred for C2 requirements
3. Retain the 10% concession for Singapore Insurance Fund foreign exchange mismatch risk requirement
4. Risk charges for some C2 requirements (e.g. equity, property & counterparty default for unrated corporates) and C4 Operational Risk are too conservative
5. Continue recognising reinsurance arrangement with Head Office, subject to safeguards

Diagram 4: Reinsurance industry –
Summary of key consultation feedback

1. Counterparty default risk requirement for unrated corporates is too stringent

- Not having a credit rating should not be equated with poor creditworthiness
- To allow use of local ratings or other measures (such as ratings of comparable peers)

2. Give credit to unrated debt securities of high quality in computing credit spread risk requirements

3. Operational risk charge is too high

4. Operational challenges in calculating counterparty default risk requirement due to need to maintain up-to-date credit rating status for all clients

5. On the proposed de-recognition of reinsurance arrangements with Head Office, to recognise reinsurance with third parties arranged via Head Office

Structure and highlights of paper

2.10 Section 3 explains the proposal on having two explicit solvency intervention levels, the PCR and MCR, at both the company and insurance fund level. This provides greater clarity to insurers on MAS' expectations with regard to solvency intervention levels and corresponding supervisory actions. The section also sheds some perspective on MAS' expectation of the additional buffer that insurers will need to maintain under RBC 2. In addition, it discusses how MAS intends to explore the feasibility of having more latitude in imposing capital requirements at the insurance fund level, in view of industry feedback on the fungibility of capital across some insurance funds

2.11 Section 4 revisits the discounting approach for policy liabilities, where the earlier proposal was to move towards the use of the 30-year Singapore Government Securities ("SGS") yield for duration of 30 years and above over a 5-year transition period. The industry had concerns that the 30-year SGS bond market was not deep and liquid enough. The section also covers the proposals to widen the eligibility criteria for matching adjustment so that it could be of more practical use to insurers. Products that do not qualify for matching adjustment may still be deemed sufficiently illiquid to warrant a partial recognition of illiquidity in the valuation of these products. Hence, MAS proposes to introduce a generic illiquidity premium, which works in a similar way as matching adjustment but will accord a smaller adjustment to the discount rate for life business.

2.12 Section 5 of the paper sets out in detail the revised calibration of the required capital. In particular, some of the risks requirements (e.g. equity investment, credit spread, counterparty default and operational risk requirements) have been moderated in view of the consultation feedback.

2.13 Section 6 covers the finalised proposals to promote consistency of, wherever appropriate, the components of available capital with those in MAS capital adequacy framework for banks. It also reviews the amount of negative reserves which may be recognised for solvency purposes under RBC 2, following the consultation feedback. In addition, the proposed capital treatment for reinsurance arrangements between a branch and its Head Office, reinsurance arranged by a Head Office for which the branch is a party to, and reinsurance downstream entities is discussed.

2.14 Section 7 details proposals on the capital treatment of the offshore insurance fund 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 capital or solvency requirements altogether (in the case of reinsurance branches).

2.15 Section 8 sets out more information on the second QIS (also referred to as “QIS 2”) on the impact of the revised RBC 2 proposals. The detailed technical specifications can be found in **Annex K**.

2.16 Section 9 outlines the next steps on RBC 2. While the design of RBC 2 is taking shape, there are still some outstanding pieces which may require further study.

2.17 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.

3 Solvency Intervention Levels

3.1 Under the current RBC framework, insurers have to maintain a minimum CAR of 100% at the company level. At the insurance fund level, they are required to maintain an FSR of 100%⁴. An insurer is also required under the Insurance (Valuation and Capital) Regulations 2004 to immediately notify MAS when it becomes aware that

- a) it has failed, or is likely to fail, to comply with meeting the 100% CAR or FSR, or
- b) its CAR would be falling below the level of 120%⁵ ("financial resources warning event").

3.2 In the case of (a), MAS may require the insurer to submit a plan on how it intends to restore the capital or fund solvency positions, be subject to enhanced monitoring, , stop renewing or issuing further policies in respect of one or more classes of business or meet any other conditions imposed by MAS. In the case of (b), MAS may require the insurer to submit a plan on how it intends to prevent the financial resources warning event from happening, and/or to carry on its business in a manner or under conditions specified by MAS.

3.3 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 VaR of 99.5%⁶ confidence level over a one-year period; and
- b) Minimum Capital Requirement ("MCR"), which is the lower supervisory intervention level at which the insurer is required to hold sufficient

⁴ Subject to a minimum of S\$5million.

⁵ Subject to a minimum of S\$5million.

⁶ 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.

financial resources to meet the total risk requirements which correspond to a VaR of 90%⁷ confidence level over a one-year period.

3.4 The above proposals, which are in line with international standards⁸ and practices of other reputable regulators, 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.

Prescribed Capital Requirement

Expectations of buffer above PCR

3.5 While most respondents supported the proposal to set two transparent triggers, namely PCR and MCR for supervisory intervention, they are of the view that there should be greater clarity on MAS' expectation of the additional capital buffer that insurers would have to maintain, including supervisory capital add-ons⁹ as well as high impact surcharge¹⁰, where applicable.

3.6 Given that MAS is enhancing the capital framework to be more comprehensive and risk sensitive under RBC 2, any capital add-ons for supervisory purposes should only occur under more specific and limited circumstances. Some examples of such circumstances include:

- a) Where the risk profile of the insurer is higher than the level that has been used in the calibration of the risk requirements under the standardised approach;
- b) To account for higher operational risks if the insurer exhibits severe operational control deficiencies where the prescribed formula under the standardised approach is deemed as inadequate for that;
- c) To account for deficiencies in the insurer's controls and processes which led to gross under-estimation of policy liabilities or capital positions, as well as inaccurate financial figures;

⁷ Which corresponds to an implied credit rating of "B-" and represents a 1-in-10 year event.

⁸ As set out in IAIS ICP 17 on Capital Adequacy.

⁹ This refers to additional capital requirements imposed as a result of limitations in the current framework or deficiencies in an insurer's risk management and internal controls.

¹⁰ This refers to additional capital requirements imposed on systemically important insurers.

- d) To account for deficiencies in the insurer's own economic capital model; and
- e) To account for offshore risks if it is assessed that a reinsurer did not manage these risks adequately.

3.7 The high impact surcharge will still be relevant for systemically important insurers, but the capital add-on is not expected to be significant.

3.8 Under RBC 2, MAS does not expect insurers to maintain as high a capital buffer as they do so under the current RBC framework. This is because the risk requirements are more comprehensive and calibrated at a higher confidence interval.

Insurance fund vs company level

3.9 A few respondents were of the view that having the PCR at a fund level which is calibrated at VaR (99.5%) over a one year period may inadvertently result in frequent engagement with MAS on capital restoration even though the funds are healthy at the MCR level. They felt that having to maintain PCR at fund level would result in over-capitalisation of the insurer and unnecessarily higher costs of insurance for consumers. Requiring PCR to be observed at the fund level also puts some constraints on the amount of diversification benefits that insurers can enjoy across insurance funds. A few respondents suggested having only the MCR requirement at the fund level, and the PCR requirement at the company level.

3.10 As explained in the second consultation, 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' fund¹¹.

3.11 To address the concern of over-capitalisation at company level, **calibration of risk requirements have been moderated to achieve VaR (99.5%) at company level**. This should address the respondents' concerns that if each fund is calibrated at 99.5%

¹¹ 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.

VaR, the overall calibration at the company level would well exceed 99.5% VaR. In addition, MAS is **prepared to explore the feasibility of having more latitude in the fund level PCR requirements**. This is on the premise that capital should be fungible across certain insurance funds (other than participating fund). Therefore, MAS will **study under QIS 2, the impact of just requiring insurers to maintain PCR at the following fund levels (see Diagram 5 below)**.

Diagram 5: Comparison between current fund and proposed adjusted fund levels

Current Fund Levels	Alternative "Adjusted" Fund Levels
<ul style="list-style-type: none"> • Singapore Insurance Fund ("SIF") – Participating ("Par") • SIF Non-Par • SIF – Investment-linked ("Linked") • Offshore Insurance Fund ("OIF") – Par • OIF – Non-Par • OIF – Linked • SIF – General • OIF – General 	<ul style="list-style-type: none"> • SIF – Par • SIF – Others • OIF – Par • OIF – Others

3.12 MAS will retain the distinction between the SIF and OIF. While capital may be fungible between these two types of funds, for general insurers and reinsurers especially, the nature of the OIF risks may be very different from the SIF risks.

Question 1. MAS seeks comments on maintaining PCR and MCR at the following adjusted fund level (i.e. SIF – Par, SIF – Others, OIF – Par, OIF – Others). Do you foresee any prudential concerns in doing so?

PCR restoration period

3.13 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 a specified time period. 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. As the PCR is calibrated at a higher level of confidence, insurers can be given more time to restore its capital position. 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.

3.14 Most of the respondents to the second consultation felt that they needed more than 3 months to restore their capital position back to PCR. Some of the actions such as reducing future bonuses and ceding a portion of risk to reinsurers might require a longer time before any impact can be seen in the capital position. Even actions such as capital injections would require time, as the company would need to obtain approval from its Board of Directors. The timeframe should not be hardwired but instead be flexible, depending on the nature of breach and proposed management actions.

3.15 MAS recognises that different timeframes may be necessary depending on the circumstances that led to the fall in capital position of the affected insurer, its overall financial condition, and the proposed management actions.

3.16 Given the above considerations, MAS will **determine the timeframe for submission of capital restoration plan and the capital restoration period on a case-by-case basis and communicate the requirement to the affected insurer.**

Minimum Capital Requirement

3.17 As set out in the earlier consultations, MAS will take its strongest supervisory actions if the MCR is breached. Such actions include stopping new business, directing a transfer of portfolio to another insurer, and in the extreme case, withdrawing the insurer's licence. **The MCR will be calibrated as a fixed percentage of the PCR for ease of computation and future monitoring.** MAS will **propose a simplified formula for consultation at a later stage, based on the results of QIS, once the design of RBC 2 is finalised.**

4 Valuation of Assets and Liabilities

4.1 Under current valuation rules set out within the Insurance (Valuation and Capital) Regulation 2004 and the relevant Notices, insurers are to value their assets at market value, or 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 premium liabilities and claims liabilities.

4.2 As stated in the second consultation, MAS will not be proposing any changes to the PAD methodology¹². Insurers may, however, need to update the current methodology based on the proposed changes to the insurance risk (i.e. C1 requirement) calibration, if applicable. MAS will **continue to monitor the developments at the international front¹³ and review the PAD methodology in the future.**

4.3 Therefore, the main changes that MAS is proposing to the valuation framework for solvency purposes would be the discounting approach for policy liabilities as well as the introduction of a matching adjustment and illiquidity premium to address the issue of short-term volatility due to differences in discounting of assets and liabilities.

Discounting approach for Policy Liabilities

Discounting of life business

4.4 Life insurers are currently required to calculate their policy liabilities using a prospective discounted cash flow method. MAS Notice 319 specifies 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.

¹² 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. Many respondents were of the view that the current PAD methodology worked well, and we should maintain status quo until there is more clarity on the international standards, be it capital or accounting related.

¹³ IAIS is currently looking at two approaches in determining the risk margin for the global insurance capital standard. One is based on a transfer value approach (i.e. cost-of-capital approach) whilst the other is based on a prudence approach (which is similar to our current approach).

4.5 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 LTRFDR¹⁴.

Currently, X and Y are 15 and 20 respectively.

4.6 When RBC was first introduced in 2004, the longest dated SGS available then was the 15-year SGS (which was incepted in 2001). Recognising that the 15-year SGS might not be liquid enough and could cause undue volatility in the risk-free discount rate as well as policy liabilities at the longer end, the LTRFDR formula was introduced with X and Y being 10 and 15. The use of a weighted average formula has kept the LTRFDR stable (see [Diagram 6](#)) and value of policy liabilities steady. Whilst this is reflective of the underlying nature of long-term life insurance liabilities, it makes liability values less sensitive to market movement in yields, resulting in short-term volatility¹⁵ due to differences in discounting of the assets and liabilities.

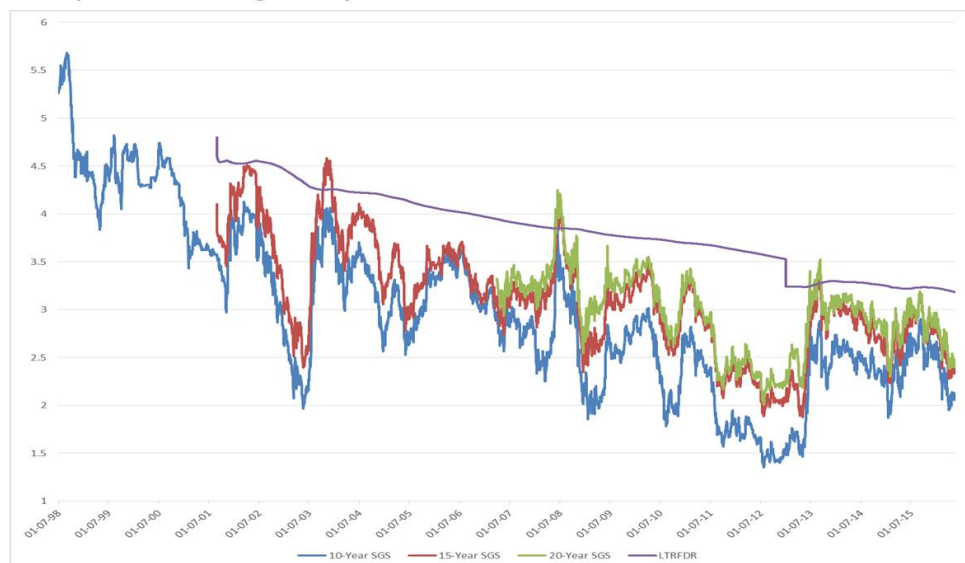
¹⁴ The stable LTRFDR is to be calculated according to the following:

- a) compute the average daily closing yield of the 15-year SGS since its inception;
- b) compute the average daily yield differential between the 15-year and 20-year SGS since the inception of the 20-year SGS;
- c) derive an estimated long-term yield by summing the values obtained under subparagraphs (a) and (b);
- d) compute the prevailing average daily closing yield of the 20-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); and
- f) the LTRFDR is then obtained by summing the two values in (e).

¹⁵ To address this volatility issue, 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 SGD 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

Diagram 6: Historical SGS yields and LTRFDR

- **SGS Yields have been trending down, but the impact to the LTRFDR is relatively dampened**
- **Expect LTRFDR to gradually increase when interest rates rise**



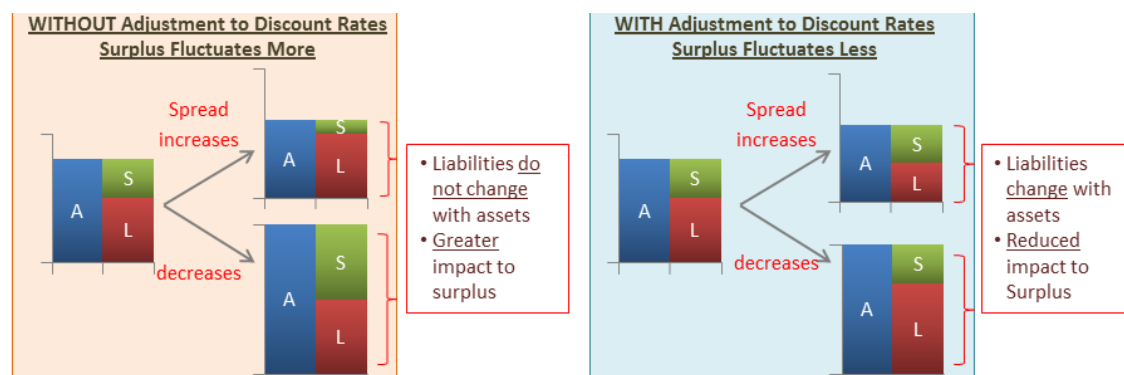
4.7 In the second consultation, MAS proposed to transit from the current LTRFDR to the use of the 30-year SGS yield (i.e. keeping the yield flat at the prevailing yield of 30-year SGS for durations 30 years and above). This is in response to the industry's concerns from the first consultation that there was insufficient liquidity for the recently introduced 30-year SGS and a few trades might result in significant 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.

4.8 MAS also proposed to address the volatility issue in a more targeted way through the introduction of a Matching Adjustment ("MA"). MA will be discussed more extensively in paragraphs 4.16 – 4.27, but what it does is that if an insurer can satisfy certain criteria e.g. predictability of liability cash flows and assets are separately identifiable and managed etc., a positive adjustment can be made to the discount curve. This will allow the liabilities to move together with the assets (see [Diagram 7](#)), except for changes in asset values related to default or downgrades, and the impact of credit spread shocks to the insurance surplus (which makes up the financial resources, or

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.

numerator of the CAR), will be dampened. The MA makes reference to the actual assets held by insurers to back the eligible policy liabilities, hence there is less basis risk, and is more responsive to credit spread movements.

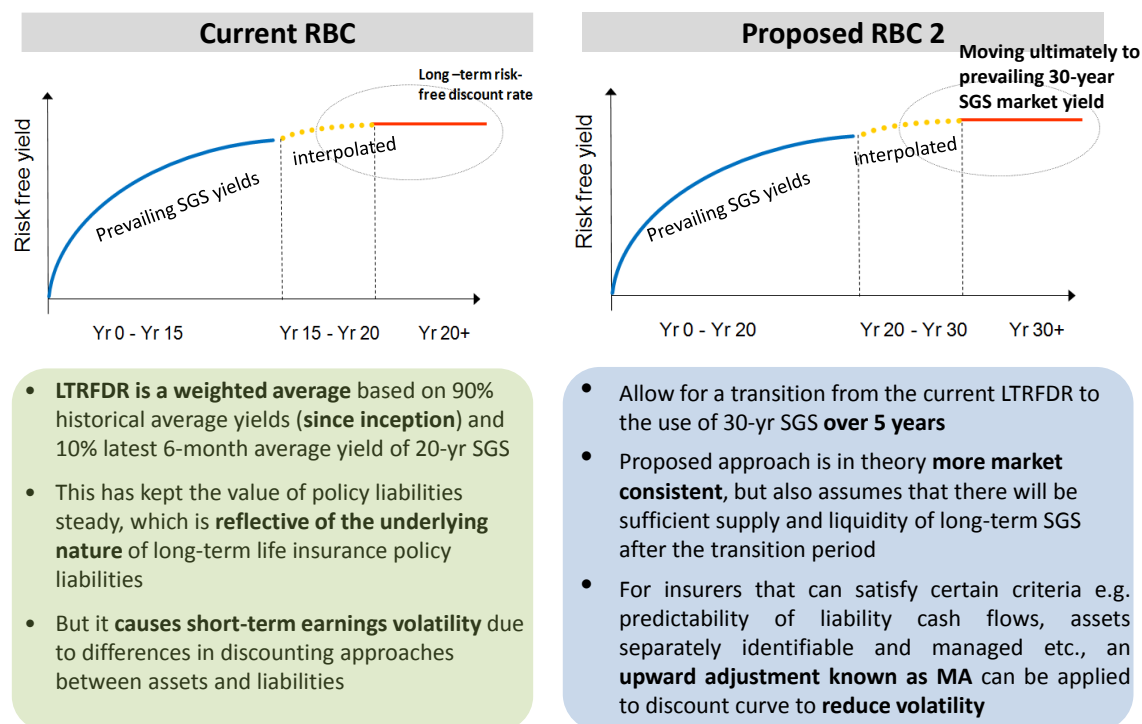
Diagram 7: Illustration of how MA helps in reducing the volatility due to credit spread movements



4.9 Diagram 8 summarises the discounting approaches under current RBC and proposed RBC 2 in the second consultation.

4.10 There are many respondents in favour of removing LTRFDR as this would lead to a more market consistent valuation of assets and liabilities, which coupled with MA and illiquidity premium (discussed later in paragraphs 4.28 – 4.33), should lead to desirable outcomes in asset-liability management. However, the industry was also concerned if the 30-year SGS market would be deep and liquid enough, and if the issuance of the 30-year SGS can keep pace with the growth of the liabilities. There were a number of respondents that did not think that the five-year transition would be sufficient. Some respondents suggested that MAS keeps the transition schedule flexible, and take into account of the liquidity and supply of the SGS. Insurers were also concerned that the long-dated SGS would be safe haven during crisis, and that might cause the yield to fall because of excessive demand, resulting in random spike in the value of liabilities.

Diagram 8: Comparison of discounting approaches



4.11 The Life Insurance Association (“LIA”) and the Singapore Actuarial Society (“SAS”) proposed extrapolation like Solvency II, from the Last Liquid Point (“LLP”) (based on 20-year SGS for now) and convergence to an Ultimate Forward Rate (“UFR”), at a certain fixed number of years, for example 40 years from the last liquid point. LIA and SAS have proposed that the UFR be 4%. SAS was of the view that it was more appropriate to tag the UFR to long-term economic growth and inflation, to be more reflective of long-dated liabilities.

4.12 The ultimate choice of the discount yield curve should be considered together with the MA and illiquidity premium adjustment. MAS understands the industry’s discomfort with moving towards the 30-year SGS yield at durations 30 year and beyond, and agrees that there is a need to work towards a deeper long-dated SGS bond market. MAS therefore proposes to **explore the route of an extrapolated yield curve as suggested by LIA and SAS**. For the purpose of QIS 2, MAS suggests to **leverage IAIS work on the design of the global insurance capital standard and use the same LLP (referred to by IAIS as “cut-off for extrapolation”) and UFR (also referred to as the “long-term forward rate”) for the various specific currencies in the 2015 field testing**

exercise (see [Diagram 9](#)). The long-term forward rates were derived based on the OECD's long-term projections of the real interest rate and inflation rate¹⁶. **For SGD, the LLP is 20 years, and the UFR is 3.5%. MAS proposes to adopt the same extrapolation approach to derive the risk-free yield curve for other currency-denominated liabilities, e.g. USD-denominated ones.**

Diagram 9: Examples of the cut-off for extrapolation points and long-term forward rates specified in IAIS' field testing exercise in 2015

Currency	Cut-off for extrapolation	Long term Forward rate* (from year 60 & beyond)
SGD	20	3.5%
USD	30	3.5%
AUD	30	4.0%
EUR	20	3.5%
RMB	10	6.8%

4.13 Meanwhile, MAS will continue to work with the industry on the extrapolated yield curves, including the choice of UFR, and the extrapolation methods.

Question 2. MAS seeks comments on the proposed discounting approach as described in paragraph 4.12.

- a) Is the proposed approach where risk-free discount rates are based on (i) observable market yields up to the LLP; (ii) UFR after a specified period after the LLP, and (iii) extrapolated yields in between, appropriate? Please explain your responses and suggest alternative approaches if your answer is 'No'.
- b) Are the proposed LLPs reasonable? If not, what would be appropriate LLPs to be used?
- c) What method should be used for extrapolating the forward rates from LLP to the point where UFR commences?

¹⁶ Please refer to <http://www.oecd.org/eco/outlook/lookingto2060.htm> for details

- d) What would be an appropriate level of UFR? How should it be determined?
- e) What should be the point at which the UFR commences? How should this be determined?

Discounting of general business

4.14 For general insurance business, **no discounting will be required for liability durations of more than one year, if the impact is not deemed to be material. Discounting will not be necessary for liability durations of one year or less.**

4.15 **Where discounting is carried out, the approach will be the same as for life business for both SGD and non-SGD denominated liabilities.** However, MA and illiquidity premium (to be discussed next), will not be applicable for general business given its typical liability profile.

Question 3. MAS seeks views on whether the MA and illiquidity premium adjustments will be relevant and helpful for general business, especially in cases where the liabilities are long-term.

Introduction of Matching Adjustment

Rationale for MA and how it works

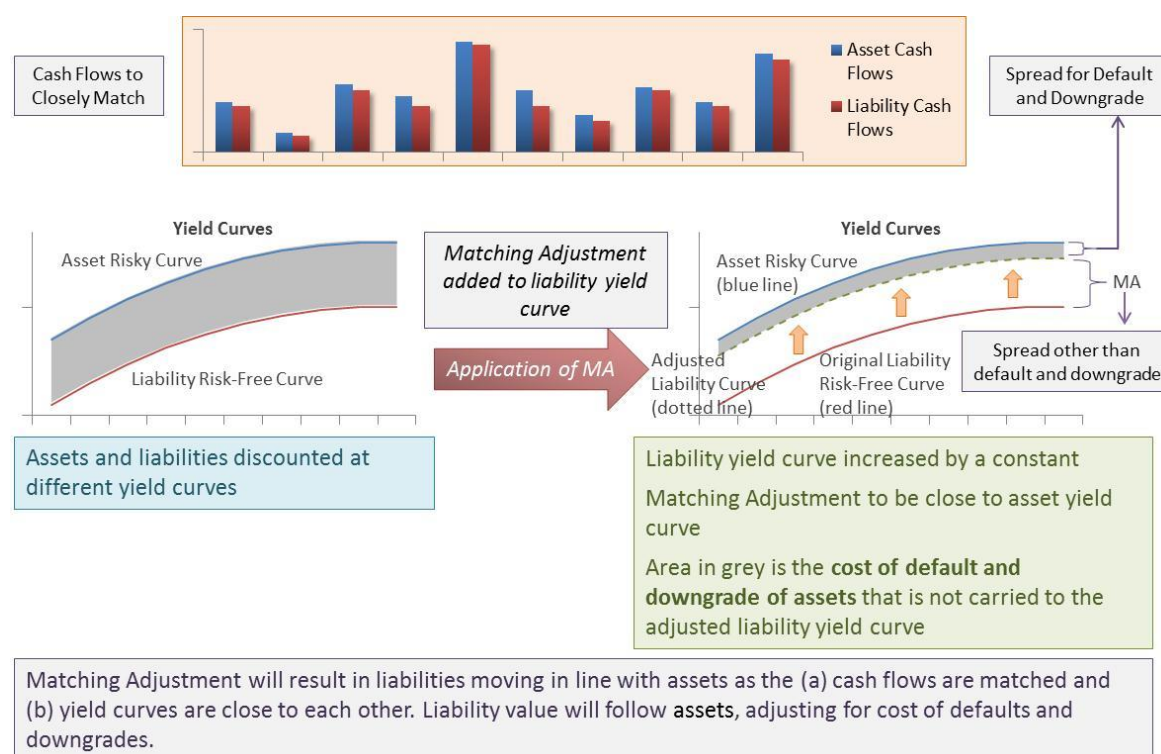
4.16 Insurers are exposed to short-term volatility in bond prices when they need to sell bonds at unexpected times, for example to meet unanticipated liability cash flows. For insurers with more predictable future liability cash flows, the bonds used to back these liabilities are more likely to be held to maturity and therefore should not be affected by short-term market volatility. Nevertheless, insurers that hold bonds to maturity are still exposed to the risk of default and downgrade of the bonds.

4.17 In the second consultation, MAS proposed introducing a MA mechanism, which was a parallel upward adjustment applied to the risk-free discount rate used in valuing eligible policy liabilities for life business. The MA would be derived from the actual portfolio of bonds that were backing the eligible policy liabilities, and was equal to the

spread of the bond yields over the risk-free rate, less an estimated spread¹⁷ for the cost of default and downgrade. MAS proposed that MA would be applicable for both SGD and USD denominated liabilities. Almost 100% of our life insurers' liabilities are denominated in these two currencies.

4.18 The MA effectively allows policy liabilities to mirror closely the market changes in the bond values that are not related to defaults or downgrades. Diagram 10 illustrates how the MA works.

Diagram 10: Illustration on how MA works



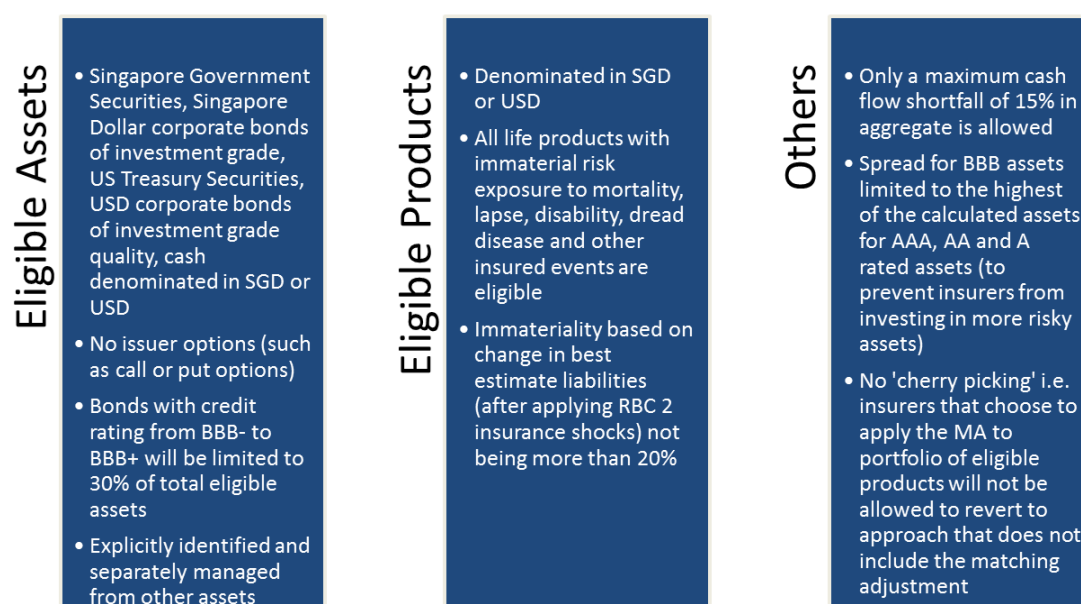
4.19 MAS also consulted on whether the conditions that needed to be met before MA could be applied ("eligibility criteria") were appropriate and whether insurers could foresee any practical issues in complying with them. Such requirements for the assets, products and constraints on cash-flow mismatching are specified in **Annex C**. Diagram 11 summarises these main criteria.

¹⁷ The spread 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). These risks are specific to the bonds, and therefore should not be applied to the discount rate for liabilities.

4.20 While more complex in working compared to a more generalised 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 (as shown in [Diagram 7](#) earlier). It also allows MAS to customise the features and eligibility criteria to suit the local market better. In addition, MA will allow insurers that can demonstrate satisfactory asset-liability management practices and commitment to hold bonds to maturity to be largely immunised from credit spread movements.

4.21 Many respondents welcomed the introduction of MA as a move to recognise the illiquid nature of insurance liabilities. They also proposed including a more generic illiquidity premium adjustment as an alternative when a simpler criteria can be met.

Diagram 11: Eligibility criteria for application of MA
(as proposed in the second consultation)



4.22 Specifically on the design of the MA itself, a number of respondents felt that the proposed eligibility criteria can be widened and made the following suggestions:

- Adopt a principle-based approach and define a range for criteria;
- Allow the use of fair value hedge similar to MAS 319 as an alternative to cash flow matching;
- Allow the use of non-SGD bonds to match SGD denominated liabilities provided they are hedged with cross currency swap;

- d) Allow the use of bonds with issuer options if convexity is properly modelled;
- e) Remove the 30% limit on the proportion of 'BBB'-rated bonds, and allow use of unrated bonds;
- f) Allow matching of selected blocks of cash flows in addition to selected products;
- g) Relax cash flow mismatching tolerance for example from 15% to 25%;
- h) Allow for recognition of reinvestment income in years where there is a surplus of cash flows from bonds after meeting liability cash flows;
- i) Exclude premium paying policies due to difficulty in matching; and
- j) Give credit if insurers can reasonably demonstrate assets are held to maturity, or for products which have sufficient surrender penalties or Market Value Adjustments.

4.23 MAS acknowledges that the eligibility criteria could be widened in order for the application of MA to be more practical and useful for insurers. Further to the second consultation, MAS closely engaged the industry, in particular SAS, on the design aspects of the MA and illiquidity premium. In view of the feedback received, MAS proposes **the following key refinements to the eligibility criteria of the MA:**

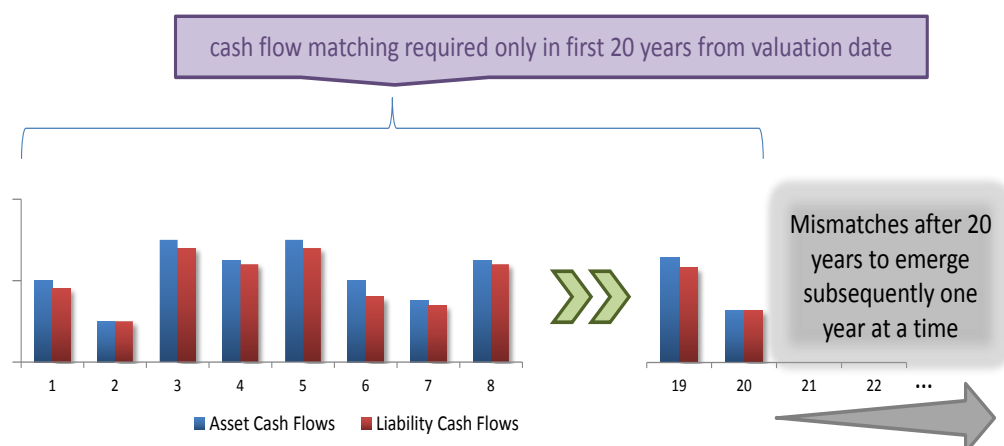
- a) **Allow the use of USD bonds** (i.e. treasuries securities or investment grade corporates) **to match SGD denominated liabilities**, subject to the insurer putting in place a suitable currency swap to convert the resulting USD payments to SGD cash flows. Where the currency swap could not be effected, a 12% haircut¹⁸ in cash flows would be imposed in the assessment of the cash flow mismatch;
- b) **Remove cash flow matching requirement for each future year of projection of the liabilities**, in recognition of the lack of long-dated bonds in the Singapore market. Cash flow matching will only be required in the 20 years following each valuation date (see [Diagram 12](#)). A 20 year period was chosen to strike an appropriate balance between minimising the risks from forced asset sales due to unexpected liability outflows and allowing insurers to purchase long dated bonds to match the liability cash flows.

¹⁸ Consistent with the foreign currency mismatch charge proposed under RBC 2.

Mismatches after 20 years will emerge one year at a time and hence allow insurers sufficient time to structure their asset portfolios to meet these later cash flows.

- c) **Allow the use of callable bonds**, but only cash flows before the first call date will be recognised¹⁹ in the cash flow matching criteria above;
- d) **Predictability test to be applied on a portfolio basis** instead of a product basis. A consequence of this refinement is that a product that would not otherwise qualify if the predictability test had been applied only to that product may now be included in a matching portfolio if there are sufficient products with stable cash flows in the matching portfolio;
- e) **Allow positive net cash flows** (i.e. excess of asset cash flows over liability cash flows) **to be rolled forward to meet deficits²⁰ in later years**. The maximum cash flow shortfall of 15% in aggregate is retained. Given that excess net cash flows can be rolled forward to meet deficits, the original concern of the allowable 15% aggregate shortfall would be allayed.

Diagram 12: Illustration of cash flow matching requirements under MA



4.24 The revised eligibility criteria can be found in Annex C.

¹⁹ Information provided by SAS indicated that only around 10% of corporate bonds in the market are callable.

²⁰ However, the asset yields used in determining the MA will be adjusted accordingly to be consistent with the revised stream of cash flows. Guidance on how the asset yields should be adjusted will be provided in the technical specifications for MA that will be issued within one month after the issuance of this third consultation paper.

4.25 On the costs of default and downgrade, a number of respondents agreed with using the same costs of default and downgrade for USD and SGD, but one respondent suggested different costs of default and downgrade for both currencies. Another respondent was of the view that the loss given default ("LGD") used in calculating the costs of default and downgrade should be differentiated by credit rating. There were no objections to updating the costs of default and downgrade on either an annual or semi-annual basis, though there was one respondent that preferred updating on a more frequent basis like quarterly.

4.26 MAS proposes **to maintain the same spread for default and downgrade for USD and SGD products, as there are difficulties in obtaining sufficiently credible data for the calibration of SGD spreads.** Likewise, MAS propose **not differentiating the LGD according to the respective credit rating of the underlying bond in determining the cost of default.** The methodology for determining the cost of default can be found in **Annex D.**

Question 4. MAS seeks comments on the proposed revisions in eligibility criteria for MA as specified in **Annex C.**

- a) Would the proposed revisions help insurers to implement the MA? Where applicable, please give alternative suggestions to improve the usefulness and relevance of MA.
- b) C1 shocks are used to assess the extent cash flows are expected to change in response to insurance shocks, which is used as a proxy for predictability. Predictability is necessary to ensure the assets are not subject to forced sales due to unexpected insurance events such as unexpected surrenders.

Should the predictability test be based on the present value of cash outflows (i.e. benefits and expenses only) instead of the best estimate liabilities which are based on the present value of cash out flows net of cash inflows (e.g. premium income)²¹? Please provide reasons for your response.

²¹ Basing the predictability test on cash outflows can avoid anomalous results arising from products in a stage where best estimate liabilities are small (when future premium income is marginally lower than future benefits and expenses) or when best estimate liabilities are negative (when future premium income exceeds future benefits and expenses).

c) Given that there are some products²² which would not benefit from the application of MA, is it necessary or practical to limit the scope of the MA to just Whole Life and Endowment (based on the classification in the statutory Form 14)? Please provide reasons for your response.

d) Is the MA relevant for life reinsurance business? Please provide details to justify your response.

Question 5. MAS seeks comments on the proposed methodology for determining the cost of default (**Annex D**).

Question 6. MAS seeks comments on any overall views or suggestions to refine the proposed MA framework.

4.27 MAS is currently working with SAS on calibrating the appropriate thresholds to apply under the predictability test. **The detailed specifications for the calibrated MA framework will be provided to life insurers within one month after the issuance of this third consultation paper.**

Introduction of Illiquidity Premium ("IP")

4.28 As mentioned, a number of respondents have suggested including some form of illiquidity premium adjustment to the risk-free discount rate used to value the liabilities for life business, in addition to the MA. They commented that the MA would only be available for insurers that are able to, or choose to, meet the strict eligibility criteria under MA. Products that do not qualify for MA may still be deemed to be sufficiently illiquid to warrant a partial recognition of illiquidity in the valuation of these products.

4.29 The liabilities of life insurers comprise cash flows that can occur over many years into the future. Depending on the nature of life insurance products, some of these products can have cash flows that are predictable in nature, in terms of the amount and timing of the cash flows. These products are considered to be illiquid and would allow insurers to structure a portfolio of bonds that can be used to support the cash flows from the products.

²² Products such as term as well as accident and health ("A&H") products have lower liabilities compared with Whole Life and Endowment products due to the absence of savings element and therefore the benefits of extending MA to term products may be minimal. Such products may not receive significant benefits from the MA due to the low levels of liabilities

4.30 Due to the predictable cash flows from these products, bonds that support these products have a greater likelihood to be held to maturity, and therefore the fluctuations in their market values should not affect the solvency position of insurers. Due to existing financial reporting and regulatory standards that require bonds to be valued at market value or fair value, an adjustment for IP can be made to the discount rates used to value the illiquid liabilities.

4.31 The IP has the same objective and works in the same way as the MA. However, the IP is intended to be applied to products that have a lower level of cash flow predictability than MA, or where the insurer is unable or not willing to meet the more stringent requirements under MA. Given that it would not be subject to the same requirements as MA (e.g. cash flow matching requirements, supporting assets to be identified and managed separately etc.), the extent of adjustment, and hence capital relief given in the case of IP would naturally be less than in MA. MAS is also unlikely to give relief to required capital (i.e. risk requirements) arising from the IP. To be clear, for a given product, the insurer can apply either the IP or MA, but not both. Please see [Diagram 13](#) for a comparison between MA and IP.

Diagram 13: Comparison between the proposed MA and IP under RBC 2

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 managed separately . The portion of spread movement from the identified 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.
Specific features	Strict criteria on eligible assets and liabilities	Strict criteria on eligible products. No asset criteria.
Strengths	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Encourage companies to maintain their traditional long term products Simpler calculation Partially responsive to spreads
Weaknesses	<ul style="list-style-type: none"> More complex calculations Restrictive nature means that only certain products will qualify 	<ul style="list-style-type: none"> May not take into account actual assets held May not promote good asset liability management as companies receive illiquidity premium regardless of matching position

4.32 Similar to the MA, MAS had engaged the industry further after the second consultation. Taking in consideration the feedback from the industry, MAS **proposes to introduce an IP to the risk-free discount rate for eligible life business, as set out in Annex E.**

4.33 MAS is currently working with SAS on calibrating the IP to be tested. As with the MA framework, **the detailed specifications for the calibrated IP framework will be**

provided to life insurers within one month after the issuance of this third consultation paper.

Question 7. MAS seeks comments on the proposed framework for IP, as set out in Annex E.

- a) What would be an appropriate IP as specified by the parameter $k\%$ of the Reference Spread? Please provide details to justify your response.
- b) Should an absolute cap (i.e. the $Y\%$) be introduced to remove the effects of extreme market movements? If 'Yes', how should the cap be set? If 'No', how should the effects of extreme market movements (which can lead to abnormally high levels of IP) be managed?
- c) The IP specifications currently state that the IP is added to the entire valuation curve. This implies that the IP can be earned throughout the duration of the liabilities. Is this treatment appropriate? Please explain your response, and if the response is 'No', please give suggestions on the appropriate length of time the IP should be applied.
- d) Similar to MA, there may be products which would not benefit from the application of IP. Is it necessary or practical to limit the scope of IP for example to just Whole Life and Endowment (based on the classification in the statutory Form 14)? Please provide reasons for your response.

Question 8. MAS seeks comments on any overall views or suggestions to improve the IP framework.

Question 9. MAS seeks views on the proposed safeguard to require financial resources after the application of MA and IP to meet at least 100% of MCR.

The application of the MA and IP will reduce liabilities due to the use of higher discount rates. To avoid insurers relying solely on the MA and IP to meet the MCR, do you agree with the above proposed safeguard? If your answer is 'No', please justify your response, as well as provide any suggestions on safeguards.

Valuation of Universal Life ("UL") Policies

4.34 The policy liability for each non-participating UL policy is currently calculated as the highest of the following three conditions:

- a) the value obtained by projecting the liabilities under the policy at the minimum guaranteed crediting rate and discounting at the risk-free rate ("MCL");
- b) the value obtained by projecting the liabilities under the policy at the current crediting rate and discounting at the best estimate investment return ("BEL"); and
- c) surrender value ("SV").

4.35 The C1 and C2 requirements for the UL policies are computed based on (a) above.

4.36 Under a high interest rate and/or high credit spread environment, the MCL and BEL may fall due to the impact of the discount rate used in valuing UL liabilities as described above. The policy liabilities would then be driven by the surrender value (i.e. SV floor will be the biting condition). The flooring of the policy liabilities to the surrender value has the following adverse effects:

- a) Continued increase in interest rates or credit spreads will cause assets to further decrease without a corresponding offset in liabilities, giving risk to volatile financial resource movements due to assets being marked to market; and
- b) Duration mismatch requirement will increase significantly due to the Liability Adjustment Requirement being floored to zero.

4.37 The application of the SV floor to liabilities also results in a non-economic valuation framework. The asset liability management mismatching issue above does not incentivise insurers to invest long-term particularly when interest rates are high, in order to avoid a large duration mismatch charge.

4.38 MAS introduced the SV floor within the reserving basis when UL policies were first launched in Singapore for the following reasons:

- a) The lapse experience for UL products tends to be influenced by market conditions. The crediting rate for UL policies is highly visible to policyholders and makes it relatively easy for comparisons to be made with interest rates on bank deposits. If the differential between the

crediting rate and rates provided by banks is sufficiently large, policyholders may choose to reduce their premium payments (for regular pay flexible premium UL policies) or surrender²³ the policy altogether. This element of policyholder behaviour makes the valuation of such UL policies more difficult and subjective compared with more straightforward whole life or endowment products;

- b) UL products can have secondary guarantees such as a no-lapse guarantee ("NLG"). Under the NLG, the policy would continue to remain in force regardless of the account value provided the required premiums has been paid; and
- c) The effects of policyholder behaviour and the secondary guarantees mentioned above are highly dependent on market performance, and stochastic models may be used to ensure the adequacy of the policy liabilities. As the valuation rules under RBC uses primarily a deterministic approach, the surrender value floor was included to ensure the policy liability is at least set to the level of the surrender value at the policy level.

4.39 Although the valuation of UL policies was not specifically consulted on during the second consultation, there was extensive feedback from life insurers for the SV floor to be removed, and for any buffer against lapse risk to be addressed through a risk requirement or some other forms of control. Comments received mentioned that the SV floor distorts asset liability management and should be removed regardless of whether there is NLG or not. One respondent suggested that the risks of future lapses and guarantees could be addressed via a mass lapse risk requirement under the C1 requirement. The charge can take the form of a factor multiplied by the difference between the SV and the MCL, when the SV is greater than the MCL. The respondent further noted that the RBC 2 framework still has the surrender value condition requirement, which largely ensures that the insurer has sufficient assets to meet surrenders.

4.40 MAS proposes to **work with the industry to enhance the valuation rules of UL policies to better account for the valuation of options and guarantees, and policyholder behaviours within such policies**. The longer term view will be to move towards the use of stochastic modelling to capture risks that cannot be adequately

²³ Taking into account the surrender charges imposed by the product.

captured by the current deterministic methods. Meanwhile, MAS proposes to **test the following approach under QIS 2**.

Question 10. MAS seeks comments on the following proposed treatment of UL policies under RBC2.

- For UL policies, the SV floor can be removed from the valuation basis, regardless of whether there is NLG or not (i.e. Policy Liabilities will be the higher of BEL and MCL).
- However, for each UL policy, the insurer would need to compute a mass lapse risk requirement calculated as:
$$30\% \times \max(\text{SV} - \text{Policy Liabilities}, 0)$$
- For the purpose of QIS 2, the proposed mass lapse risk requirement for UL policies will be aggregated under the lapse risk requirement.

4.41 MAS notes that there is a lack of data which can be used to calibrate the mass lapse requirement for UL policies. The factor of 30% above is chosen based on a consideration of the factors used under MAS' annual industry-wide liquidity stress testing for direct life insurers as well as other insurance capital standards²⁴.

Question 11. MAS seeks comments on whether the 30% factor used to compute the mass lapse risk requirement for UL policies is appropriate.

Where the 30% factor is not considered as appropriate, please explain your responses and provide suggestions (i.e. methodology and reference data) for an appropriate approach to calibrate the factor.

Question 12. MAS seeks views on how UL policies should be treated in the computation of the surrender value condition requirement²⁵ at the fund level, given that

²⁴ For example, a 30% factor for individual business is used for Solvency II and the 2015 field testing for the IAIS global insurance capital standard being developed by the IAIS.

²⁵ Surrender value condition requirement, in the case of a non-participating fund, is the additional risk requirements to be set aside when the aggregate value of the surrender values of the policies in the fund is more than the sum of the policy liabilities and total risk requirements of the fund.

the excess of surrender values over policy liabilities has already to some extent, been taken into account in the mass lapse risk requirement for UL policies, which will form part of the total risk requirements.

5 Components of Required Capital

Introduction and reorganisation of risk modules

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

- a) **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;
- b) **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;
- c) **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.

5.2 In the second consultation paper, MAS proposed to keep the above broad classification under RBC 2, but with some of the following changes to improve clarity and transparency (refer to **Annex F**):

- a) **Introduction of new risks** – C1 will now include insurance catastrophe risk requirement (for both life and general business). A new category, C4, will be introduced as well to cover operational risk requirement;
- b) **Reclassification of debt investment and duration mismatch risk requirements to interest rate mismatch and credit spread risk requirements** - C2 debt general risk requirement and liability adjustment requirement (collectively known as duration mismatch risk requirement under current 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;

- c) **Streamlining of risk requirements relating to counterparty default** - 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
- d) **Breakdown of the C1 life insurance policy liability risk requirement to its underlying components** - 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).

5.3 MAS will not be imposing an explicit risk charge for liquidity risk. MAS has already incorporated the liquidity stress testing as part of the annual industry-wide stress test exercise. Meanwhile, MAS will continue to assess the robustness of insurers' liquidity risk management through supervision.

5.4 There was general support for the proposed organisation of risk modules under RBC 2. As such, MAS will adopt this proposed organisation, with some updates in view of the consultation feedback received on the specific risk requirements. Paragraph 5.173 shows the updated proposed organisation of the risk modules.

Target criteria for calibration of risk requirements

5.5 Under the current RBC framework, the main C2 requirements like equity and debt risk requirements largely follow the calibration of market and credit risk charges under the banking framework, which were calibrated at different confidence levels for different risks. As RBC was introduced in 2004, the calibration of the C2 requirements was done before the 2008 global financial crisis. In addition, though the C1 requirements for general insurance were calibrated to a level close to 95 to 97.5% confidence level, the C1 requirements for life insurance were not calibrated to any specific target criteria.

5.6 MAS proposed to re-calibrate risk requirements notionally using the VaR measure of 99.5% confidence level over a one year period.

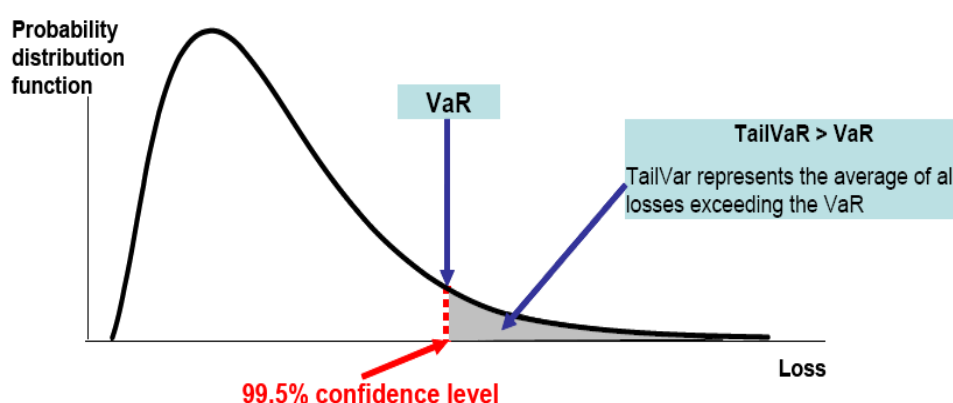
5.7 There are 2 common risk measures used internationally (shown in [Diagram 14](#)):

- 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 VaR (“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%).

Diagram 14: Illustration of VaR and TailVar



5.8 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.

5.9 **On balance, MAS has proposed to calibrate the risk requirements under the standardised approach using the VaR measure, and targeting notionally at a confidence level of 99.5%²⁶ over a one-year period.**

5.10 MAS recognises that tail risks may be underestimated with the use of VaR and intends to rely on industry-wide stress tests and the insurer’s ORSA to test the impact of tail events. In addition, MAS will have the power to impose additional capital add-ons should we find that the standardised approach does not capture the risks of the insurer

²⁶ Most of the major insurance jurisdictions have calibrated their capital framework at a level which corresponds to a VaR (99.5%) over a one year period. This corresponds to an implied credit rating of at least an investment grade.

adequately. Hence, where a particular insurer is shown to be very vulnerable to tail events under the industry wide stress test exercise and ORSA, MAS may impose additional capital requirements. Further, MAS may consider the use of tVaR²⁷ under the internal model approach, which will be explored at a later stage, if insurers can demonstrate that tVaR is more reflective of the nature of their risks.

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

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

Allowance for diversification benefits

5.12 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 requirements²⁸ are also added together, without allowing for any diversification effects with the help of correlation matrices. A number of major insurance jurisdictions have moved towards allowing for diversification effects when combining various risk modules²⁹, and even within sub-modules, using prescribed

²⁷ 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.

²⁸ For example, for C1 requirements for general business, premium liability and claims liability risk requirements are summed together. For C2 requirements, the respective risk requirements are added together, for example, equity, property, debt, asset-liability mismatch, foreign currency mismatch and loan risk requirement.

²⁹ Examples of risk modules can be life insurance risk, general insurance risk, asset risk and counterparty risk.

correlation matrices. This has the effect of reducing the overall regulatory capital requirements. Not allowing for diversification benefits will hence be punitive to insurers operating in Singapore.

5.13 In the second consultation, MAS proposed to allow for diversification benefits in the following ways:

- a) Under C1 requirements for life business³⁰, an explicit correlation matrix has been prescribed to combine certain, but not all, the underlying risk requirements under C1. MAS had selected risk requirements where correlation behaviours were more intuitive and expected to be more stable in times of stress. Specifically, these were mortality (non-annuity), mortality (annuity), dread disease, other insured events (accident & health) and life insurance catastrophe risk requirements;
- b) Within C2 requirements, the calibrated risk factors or shocks have already been implicitly³¹ adjusted downwards to take into account of the diversification across all asset risk types;
- c) 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;
- d) Between C1 requirements and C2 requirements, the diversified sum of C1 and C2 requirements is $\sqrt{C1^2 + C2^2}$. Here, we have assumed that the C1

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.

³⁰ The diversification benefits within C1 requirements 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 are close to finalisation. Currently, diversification across business lines is already implicitly allowed for in the determination of the PAD for general business.

³¹ MAS generally expects 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 via MAS Notice 122 on insurers' asset exposures regularly, MAS has carried out simulations 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. The C2 requirements were then adjusted downwards uniformly by this observed level of diversification benefit.

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

5.14 Based on the consultation feedback received, there is room to accord more diversification benefits for C1 requirements for life business by expanding the correlation matrix to cover all C1 risks. Majority of the respondents also preferred having an explicit correlation matrix for C2 requirements, and one respondent even suggested allowing for diversification benefits arising between the underlying risk components within a risk requirement, i.e. intra-risk diversification. More will be discussed in the respective sections later.

C1 requirements for life business

Mortality (non-annuity) risk requirement

5.15 Mortality risk is the risk associated with the variability in liability cash flows due to the incidence of death. In the second consultation, MAS proposed to apply a permanent 20% increase to the best estimate mortality (non-annuity) rate assumptions under RBC 2. In addition for Singapore risks, MAS proposed to remove the reference to a prescribed standard table³² when determining the mortality (non-annuity) risk requirement. Instead, the mortality shock will be applied on the best estimate mortality (non-annuity) rates under RBC 2 for these Singapore risks.

5.16 There was general support in removing reference to the prescribed mortality table as the table 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).

5.17 On the calibration methodology, there were some suggestions to use n-year rolling actual over expected data instead of one-year actual over expected data to allow for random fluctuations. As mentioned in the second consultation paper, it is

³² Table 15 of Sixth Schedule in Insurance (Valuation and Capital) Regulations 2004

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. This is also consistent with the overall approach taken in calibrating all the risk requirements to a VaR (99.5%) over a one year period. However, recognising that the mortality shocks are applied on a long-term best estimate assumption, the factor has already been moderated down from 25% to 20%. In fact, based on the respondent's suggestion to calibrate over a 5-year period, a VaR (97.5%) would give a factor of 12%, and a VaR (99.5%) would give a factor of close to 50%.

5.18 Given the above reasons and the materiality of this risk requirement³³, MAS will **maintain the proposed 20% factor**. MAS will also **rename the risk requirement as mortality risk requirement, instead of mortality (non-annuity) risk requirement for simplicity**.

Mortality (annuity) risk requirement

5.19 Longevity risk is the risk associated with the variability in liability cash flows due to increasing life expectancy. In the second consultation, MAS proposed to apply a permanent 25% decrease to the best estimate mortality (annuity) rate assumptions under RBC 2. In addition for Singapore risks, MAS proposed to remove the reference to a prescribed standard table when determining the mortality (annuity) risk requirement. Instead, the longevity shock will be applied on the best estimate mortality (annuity) rates under RBC 2 for these Singapore risks.

5.20 There was general support in removing reference to the prescribed standard table for annuitants as the table does not accurately represent the underlying rate of mortality experienced by insurers for annuitants. A few respondents commented that the calibration of this risk requirement should take into account the fact that insurers have already accounted for mortality improvement in their best estimate valuation assumptions. Two respondents also sought clarification on the application of this longevity shock on non-annuity products such as long-term care.

5.21 Given the limited data available currently for calibration, and that one would typically expect longevity risk to be subject to more uncertainty than mortality risk, the

³³ Based on QIS 1 results, the impact from mortality (non-annuity) risk requirement is not that material as compared to the C2 requirements.

proposed 25% factor does not seem unreasonable relative to the proposed 20% factor for mortality shock. In addition, this risk is also not as material based on the QIS 1 results. MAS will therefore **maintain the proposed 25% factor**. We will review and adjust this calibration as insurers develop and improve their longevity forecasting models to refine their estimates over time.

5.22 MAS will also **rename the risk requirement as longevity risk requirement, instead of mortality (annuity) risk requirement for simplicity**. The decision as to whether to apply a mortality or longevity risk shock for any given policy should be based on the shock that would result in higher liabilities.

Disability risk requirement

5.23 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. Most of the mortality business also has a rider attached that accelerates the payout of the sum assured when TPD occurs.

5.24 In the second consultation, MAS proposed to apply a permanent 20% increase to the best estimate disability rate assumptions under RBC 2. As mentioned, 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. Hence the same level of shock as the mortality shock was proposed.

5.25 It is noted that in several 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.

5.26 Not much feedback was received specifically on this proposal as the proposed factor followed that of the mortality risk factor. MAS will **maintain the proposal to apply a permanent 20% increase to the best estimate disability risk assumptions**.

Dread disease risk requirement

5.27 Dread disease 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 in Singapore as an accelerating rider³⁴ to a basic life insurance policy.

5.28 In the second consultation, MAS proposed 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. Premium rates for dread disease tend to be reviewable given the greater uncertainty in the experience due to medical advances or new diseases that may emerge in the future. Larger margins would therefore be needed if rates are guaranteed.

5.29 There was general support to apply different factors to policies depending on whether the premium payable is guaranteed or not. A few respondents sought clarification on the treatment for policies with limited premium payment period (i.e. limited pay policies), policies with guaranteed premium rates for a certain number of years, and non-guaranteed premium rates thereafter.

5.30 In view of the feedback, MAS will maintain its proposal to **apply a permanent 40% increase during the period when premium rates are guaranteed and 30% increase during period when premium rates are non-guaranteed**. The factor for the period during which premium rates are guaranteed should apply for limited pay policies after the premium payment term, as there are no further premium receipts.

Other insured events (accident & health) risk requirement

5.31 Other insured events (accident & health)("A&H") 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. In the second consultation, MAS proposed to apply the same level of shock as the dread disease risk requirement, i.e. 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

³⁴ The rider accelerates the payment of the sum assured of the basic policy upon the occurrence of the dread disease.

duration of the policy), to the best estimate other insured events (A&H) incidence rate assumptions under RBC 2.

5.32 This was a pragmatic approach given the practical challenge to find suitable data to calibrate this risk requirement, given that there tends to be more variability in the design of A&H products. Logically, the approach made sense as one would expect some implicit correlation between the dread disease and other insured events 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 also adopted for the current RBC framework. **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.**

5.33 There was general support to apply different factors to policies depending on whether the premium payable is guaranteed or not. Some respondents were of the view that the permanent increase did not reflect the insurer's ability to re-price the product, and suggested applying a lower factor after 5 years, which represented a typical re-pricing cycle.

5.34 One of the respondent was of the view that a permanent 30% shock for a long-term health insurance with non-guaranteed premium rates, such as Integrated Shield plan, is too severe. If a 30% permanent increase in claims cost were to crystallise, it is unlikely that shareholders would be willing to accept the loss. Instead insurers would increase the price of the plan when faced with escalating claims cost. The respondent suggested to allow the 30% shock to taper off over time to mimic the effects of re-pricing, or to allow insurers to take into account of re-pricing when calculating the risk requirement.

5.35 It is uncertain whether insurers can indeed re-price after a certain number of years as they may face competitive pressures and other constraints (e.g. bound by what is permissible contractually). Practically, there is also a limit to how much further the 30% factor can be adjusted downwards, since mortality and longevity shocks are calibrated at 20% and 25% respectively, and one would expect the claims for accident and health products to be more volatile than mortality and longevity risks. Besides, the calibration is also targeted at VaR (99.5%) over a one year period, meaning a one-in-200 chance of mis-estimating the current estimate, and this mis-estimation applies throughout the duration of the policy based on the current year's current estimate.

5.36 Based on the QIS 1 results, the impact of the other insured events risk requirement is not that material compared to other C1 requirements. Given that the valuation methodology of the A&H policies are also pending further review and

finalisation, MAS proposes **maintaining the application of a permanent 40% increase during the period when premium rates are guaranteed, and 30% increase during period when premium rates are non-guaranteed, to the best estimate other insured events (A&H) incidence rate assumptions.**

Question 13. MAS seeks comments on the proposed approach as described in paragraph 5.36 above.

Question 14. MAS seeks comments on the following approach, where MAS will continue to engage LIA and SAS in exploring whether it is feasible to collect more granular data from insurers and calibrate the risk requirement. Specifically, MAS proposes to work with LIA and SAS on:

- a) assessing what type of data needs to be collected from insurers and if it is feasible to do so;
- b) evaluating how to calibrate the risk charge with the proposed data collection (e.g. which distribution to assume etc); and
- c) reviewing the design of this risk module, taking into consideration of international developments (e.g. the design of the global insurance capital standard by IAIS).

The work here will be inter-linked with the work on the valuation methodology of the long-term health policies (paragraph 6.44).

Life insurance catastrophe risk requirement

5.37 Insurance catastrophe risk stems from extreme or irregular events which effects are not sufficiently captured in the other C1 requirements. A pandemic event is one example. In the second consultation, MAS proposed to introduce an explicit life insurance catastrophe risk requirement made up of both a mortality as well as morbidity (sickness) component. The morbidity component was thought to be relevant as during a pandemic event, we can expect to observe not just higher mortality rates, but an increase in the medical claims incidence as well.

5.38 Specifically, the proposal was to apply a mortality shock of an additional 0.5 death per 1000, and a morbidity shock of an additional 40 hospitalisation claims incidence per 1000 to rates across all ages in the next 12 months. The life insurance catastrophe risk requirement would be the additional capital required to be set aside.

5.39 The consultation feedback was mainly on the morbidity shock component. A number of the respondents felt that this shock was too severe as it assumes 4% of the population requiring hospitalisation. During the SARs outbreak, it was noted that less than 300 people in Singapore were infected. Further, the calibration should be lowered to reflect the capacity limitations of Singapore hospitals and to consider high incidence during catastrophe may be associated with lower severity of claims size³⁵.

5.40 Whilst considering the morbidity component in this risk module is conceptually sound, MAS recognises that this is still an evolving area and not that many jurisdictions³⁶, including the initial design of the IAIS global insurance capital standard, have considered morbidity shock for life insurance catastrophe risk requirement yet. MAS will therefore **continue to monitor developments in this area internationally, before deciding to incorporate the morbidity component again**. This is a potential area of collaboration with SAS. For purpose of QIS 2, the morbidity component will be removed. Correspondingly, **the mortality shock of an additional 0.5 death per 1000 will increase to 1 death per 1000 for QIS 2**, given that Singapore has one of the highest population density in the world and is a travel hub globally. In proposing this revised calibration, we have also looked at the calibration adopted in other major jurisdictions.

Question 15. MAS seeks comments on the proposed approach in calibrating the life insurance catastrophe risk requirement, as described in paragraph 5.40.

Expense risk requirement

5.41 Expense risk is the risk associated with the variability in liability cash flows due to the incidence of expenses incurred. In the second consultation paper, MAS proposed to use +20% shock for the first year and +10% thereafter on the best estimate expense assumptions for the expense risk requirement.

³⁵ For catastrophic events like pandemic, it is generally observed that the period of hospital stay is shorter (e.g. people dying sooner), so the amount of hospitalisation claims should be lower.

³⁶ Australia has incorporated morbidity (but specifically on disablement) shock in addition to a mortality shock for the life insurance catastrophe risk charge. In Switzerland, under the Swiss Solvency Test, insurers are required to consider increased deaths, increased hospitalisation and increased number of days absent from work under the pandemic event scenario. Canada implicitly considered morbidity shock given that there is a catastrophe shock component under the morbidity risk module.

5.42 A few respondents commented that the higher factor proposed for the first year does not reflect the insurer's ability to manage expense risk in the long run. Some other respondents also highlighted that the expense risk requirement could possibly overlap with operational risk requirement.

5.43 MAS recognises that expense risk is more within the control of insurer, which is why we have substantially lowered the factor to be used, even though the calibration gives a factor of 25% based on VaR (99.5%) over one year. We noted that most jurisdictions use 10% as a permanent increase but with some further shock to inflation rate or higher shock applied for the first year. It is reasonable to assume a higher shock for the first year, as it would also take some time for insurers to put in place some management actions to minimise the expense overruns. To clarify, we have also adjusted the data used for calibrating the expense risk requirement on a best effort basis, to remove any extraordinary payouts due to operational lapses. Hence this should minimise the possibility of overlap with the operational risk requirement when calibrating the shocks.

5.44 The expense risk requirement is also not material based on the QIS 1 results. MAS will therefore **maintain the +20% shock for the first year and +10% thereafter to the best estimate expense assumptions (including for expense inflation).**

Question 16. MAS seeks comments on whether there is a need to have a separate shock on the expense inflation rate. If a separate shock is needed, what method as well as reference data can we use to calibrate this shock, as well as the correlation between the unit expense and inflation components?

Lapse risk requirement

5.45 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. In the second consultation, MAS proposed to apply a permanent increase/decrease of 50% to the best estimate lapse rate assumptions, whichever produced a higher liability value.

5.46 It was highlighted in the second consultation paper that the maximum relative change in lapse rate on average for the duration of 0 – 2 years was observed to be around 50% based on the persistency rate data which MAS used for calibration. A few respondents provided feedback that calibration based on early durations tend to be volatile and not reflective of the permanent increase on best estimate assumptions. There were also comments that the lapse shock should differ by products.

5.47 In view that the lapse shock is to be applied over a long-term best estimate lapse assumption, we have already moderated the shock to 50%. In addition, there is a lack of granular data to support calibration at a product level, not to mention the increased complexity in the computation of the risk requirements.

5.48 MAS therefore proposes to **maintain applying a permanent increase/decrease of 50% to the best estimate lapse rate assumptions, whichever produces a 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.

5.49 It is noted that the preliminary design of the IAIS global insurance capital standard³⁷ has like Solvency II³⁸, considered a mass lapse event in computing the lapse risk requirement. Mass lapse event is to capture temporary, large increases in lapses occurring over a short period of time due to loss of confidence in the insurance company or financial crisis that may lead to a general loss of public confidence in the insurance industry. Currently, MAS assesses the impact of mass lapse event on life insurers under the annual industry-wide liquidity stress testing.

Question 17. MAS seeks comments on the relevance, design and calibration of the mass lapse event within the computation of the lapse risk requirement.

- a) Whether there is a need to include a mass lapse event as one of the conditions when calculating the lapse risk requirement (i.e. lapse risk requirement will be based on (i) a permanent increase of 50% to the best estimate lapse rate assumptions, (ii) permanent decrease of 50% to the best estimate lapse rate assumptions, or (iii) the mass lapse event, whichever produces a higher liability value);
- b) Whether the mass lapse event should be dependent on the type of product e.g. predominantly savings or protection products, positive or negative surrender

³⁷ For the field testing in 2015, the mass lapse event was defined as the immediate surrender of 30% of retail policies with positive surrender strain, immediate surrender of 50% of non-retail policies with positive surrender strain and zero surrender for all others.

³⁸ 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.

strain etc.; and

- c) What method and reference data should be used to calibrate the mass lapse event.

5.50 MAS proposes to **continue to apply a permanent increase/decrease of 50% to the best estimate lapse rate assumptions, whichever produces a higher liability value, for QIS 2**. However, MAS will also **obtain additional information on the quantitative impact of a prescribed mass lapse event for further analysis under QIS 2**. This mass lapse event is to be defined as the immediate surrender of 30% of individual policies and 50% of group policies, for all surrenderable policies (i.e. policies that provide cash value upon surrender). MAS is prepared to **explore removing the existing surrender value condition risk requirement**, else there will be double-counting since the surrender value condition risk requirement is effectively addressing the same mass lapse risk, albeit at a more conservative assumption that 100% of the policies will be lapsed or surrendered.

Question 18. MAS seeks comments on the proposed approach described in paragraph 5.50 above.

Conversion of options risk requirement

5.51 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' behaviour, just like lapse risk, MAS proposed to use the same level of shocks as prescribed for the lapse risk requirement module in the second consultation.

5.52 Not much feedback was received specifically on this proposal as the proposed factor followed that of the lapse risk factor. We will maintain the proposal to **apply a permanent increase/decrease of 50% to the best estimate assumptions of the conversion of options, whichever produces a higher liability value**.

Aggregating C1 requirements for life business

5.53 As mentioned earlier in paragraph 5.13, one of the ways in which diversification benefit will be recognised under RBC 2 is by aggregating specific C1 requirements for life business using a prescribed correlation matrix. In the second consultation, MAS proposed an explicit correlation matrix for aggregating the mortality (non-annuity),

mortality (annuity), dread disease, other insured events (A&H) and catastrophe (mortality and morbidity components).

5.54 Most of the respondents were of the view that the correlation matrix should be expanded to cover all other risk requirements such as disability, lapse, and expense within the C1 category. Given that many jurisdictions have also allowed for diversification between all the underlying modules within the life insurance risk category, the proposed approach in the second consultation would be deemed as punitive to insurers operating here.

5.55 One respondent commented specifically on the factors proposed in the prescribed correlation matrix, but mainly on the pairings with catastrophe (morbidity), which we will not be introducing for now (see paragraph 5.40).

5.56 In view of the feedback received, MAS proposes to **expand the correlation matrix to incorporate all other C1 requirements**. In coming up with the correlation matrix, MAS has checked for overall reasonableness with the correlation matrices used by other major jurisdictions, as well as some of the licensed insurers under their economic capital models. Given data constraints, this is largely based on our observations and general understanding of the behaviours between certain pairings of risks.

Question 19. MAS seeks comments on adopting the correlation matrix ([Diagram 15](#)) when aggregating the C1 requirements for life business:

Diagram 15: Correlation matrix for all C1 requirements

	Mortality	Longevity	Disability	Dread Disease	Other Insured Events	Catastrophe	Expense	Lapse	Conversion of Options
Mortality	1	-0.25	0.25	0.5	0.5	0.25	0.25	0	0
Longevity	-0.25	1	0	0.25	0.25	0	0.25	0.25	0.25
Disability	0.25	0	1	0.5	0.5	0.25	0.5	0	0
Dread Disease	0.5	0.25	0.5	1	0.5	0.5	0.5	0	0
Other Insured Events	0.5	0.25	0.5	0.5	1	0.75	0.5	0	0
Catastrophe	0.25	0	0.25	0.5	0.75	1	0.25	0.25	0.25
Expense	0.25	0.25	0.5	0.5	0.5	0.25	1	0.5	0.5
Lapse	0	0.25	0	0	0	0.25	0.5	1	0
Conversion of Options	0	0.25	0	0	0	0.25	0.5	0	1

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

$$\sqrt{\sum \text{CorrLife}_{r,c} * \text{Life}_r * \text{Life}_c}$$

where

$\text{CorrLife}_{r,c}$ = the entries of the correlation matrix

$\text{Life}_r, \text{Life}_c$ = Risk Requirement for individual life sub-risks according to the rows and columns of correlation matrix

C1 requirements for general business

5.57 As mentioned in paragraph 5.5, 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 developed³⁹. This will address the industry's concerns that MAS will calibrate the insurance catastrophe risk requirement in isolation of the premium and claim liability risk requirements. MAS will work closely with the industry in reviewing the current C1 requirements for general business.

5.58 This will also mean that the insurance catastrophe risk requirement for general business, as well as the re-calibrated premium liability and claim liability risk requirements, will be implemented at a later date than the rest of the proposals under RBC 2, as they will be finalised later.

Question 20. MAS seeks comments on whether there is a need to consider other types of risks (e.g. lapse) for C1 requirements for general business, in addition to premium liability, claim liability and insurance catastrophe risk requirements. If so, what are these risks, and how are they relevant for general business? What method and reference data should be used to calibrate these risks?

³⁹ 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 and work is underway in developing the insurance catastrophe risk requirement for both the SIF and OIF for general business.

C2 requirements

Explicit correlation matrix for C2

5.59 As mentioned in paragraph 5.13, MAS proposed to account for diversification benefits implicitly⁴⁰ within the calibration of each C2 requirement in the second consultation. This means that the C2 requirements proposed in the second consultation had already been adjusted downwards to account for the diversification benefits. The intention is to monitor the implicit diversification regularly to ensure that the C2 requirements remain appropriate.

5.60 Many respondents expressed a preference for an explicit correlation matrix as it offers greater transparency and better reflects the risk profile of each insurer. Having an explicit correlation matrix also avoids the need for MAS to monitor the risk profile of individual insurers relative to the industry average. In addition, one respondent suggested that diversification benefits arising between the underlying risk components within a risk requirement, i.e. intra-risk diversification, should also be captured, where material. These include, for example, listed versus unlisted equities, and SGD versus USD interest rate and exchange rate. Such intra-risk diversification benefits can be allowed for implicitly, instead of explicitly through correlation matrices, for ease of computation.

5.61 The same respondent further suggested that MAS should consider correlation structures of medium to longer risk horizon, rather than short risk horizon correlations. A longer risk horizon recognises the long-term and predictable nature of life insurance liabilities where obligations to policyholders are only due in the not-so-near future, and insurers do not need to liquidate most securities in the short term. Using correlation structures of longer risk horizons could transform calibrated one-year VaR movements into risk requirements over a longer risk horizon. However, the respondent acknowledged that the RBC 2 framework was to be applied on all insurers, including general insurers, some of which have a shorter risk horizon.

5.62 MAS acknowledges the industry feedback that an explicit correlation matrix would better differentiate between different investment profiles. The suggestion to recognise intra-risk diversification, in addition to inter-risk diversification, was also

⁴⁰ The asset exposure data which MAS collects on a regular basis under MAS Notice 122 allows the diversification benefit across the various asset risk types to be derived at the industry level, based on the average industry portfolio. The way in which the implicit diversification benefit is derived has been explained in the second consultation paper.

reasonable. In view of the consultation feedback, MAS proposes **to introduce an explicit correlation matrix for C2 requirements. The C2 requirements will also have to be re-calibrated to account for the following:**

- a) Removing the implicit diversification haircut from the previous proposed risk requirements;
- b) Incorporating any intra-risk diversification benefits, which have not been considered previously, implicitly within each C2 requirement;
- c) Incorporating any specific consultation feedback received on the respective C2 requirement, including the need to ensure that the overall risk requirements are not punitive and deter insurers from investing in such assets at the detriment of the policyholders; and
- d) Checking for comparability with the risk requirements of other major jurisdictions.

5.63 **Annex G** summarises the approach taken by MAS to derive the explicit correlation matrix as well as the intra-risk diversification benefits.

Question 21. MAS seeks comments on the proposal to allow for diversification benefits explicitly through the prescribed correlation matrix (Diagram 16) to aggregate the C2 risk requirements:

Diagram 16: Correlation matrix for C2 requirements

(a) Upward interest rate scenario

	Equity	Interest Rate	Credit Spread	Property	FX mismatch
Equity	1	0.1	0.8	0.8	0.1
Interest Rate	0.1	1	0.1	0.1	0.1
Credit Spread	0.8	0.1	1	0.5	0.1
Property	0.8	0.1	0.5	1	0.1
FX Mismatch	0.1	0.1	0.1	0.1	1

(b) Downward interest rate scenario

	Equity	Interest Rate	Credit Spread	Property	FX mismatch
Equity	1	0.5	0.8	0.8	0.1
Interest Rate	0.5	1	0.5	0.25	0.1
Credit Spread	0.8	0.5	1	0.5	0.1
Property	0.8	0.25	0.5	1	0.1
FX Mismatch	0.1	0.1	0.1	0.1	1

Question 22. MAS seeks comments on how we should combine the aggregated C2 risk requirements (i.e. those covered by the explicit correlation matrix) with the C2 counterparty default risk requirement. We recognise that there should be some correlation between the market risks and the counterparty default risk. Is 0.5 a reasonable and practical factor to use given data constraints? Please provide alternative suggestions if you disagree with the approach.

Equity investment risk requirement

5.64 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 or 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.

5.65 In the second consultation, MAS proposed 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 Markets⁴¹: 40%
- b) Listed in Other Markets: 50%; and
- c) Unlisted Equity (including private equity and hedge funds): 60%

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

5.67 A number of the respondents felt that the proposed equity risk requirements were too high. The high risk requirements may discourage equity investment, leading to reduced attractiveness of participating products. As the risk profile for unlisted equities, private equity and hedge funds can vary significantly, one respondent also suggested that we introduce more granular sub-categories for unlisted equity, or re-calibrate the risk requirement to reflect a more average profile of available unlisted equities, instead of being biased towards the riskier investments. MAS may then impose regulatory add-ons for equities which demonstrate greater volatility.

5.68 MAS has considered the feedback and moderated the calibration of the equity risk requirement. We have also re-calibrated the risk requirement for unlisted equity to reflect a more average profile as suggested by one respondent.

5.69 In addition, as recalibration work did not yield significantly different results for the categories of "Listed in Other Markets" and "Unlisted Equities", MAS is proposing to **reduce the number of categories to two; "Listed in Developed Markets" and "Other Equities"**. The behaviour of the two categories will be monitored.

Question 23. MAS seeks comments on the following approach of having two distinct risk categories for equities and applying the following factors, to the market value of each equity exposure:

- a) Listed in Developed Markets: 40%
- b) Other Equities: 50%

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

⁴¹ For Developed Markets, reference will be made to MSCI Inc's list of countries in MSCI World Index.

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 2 technical specifications (**Annex K**).

Treatment of Collective Investment Schemes ("CIS")

5.70 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 charge⁴² instead of an equity investment risk charge.

5.71 In the second consultation, MAS proposed to allow insurers to apply the look-through approach⁴³ 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. MAS proposed to allow the insurers 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 requirement on the market value of the CIS instead.

5.72 Most respondents welcomed the proposed look-through approach as it better reflects the economic substance and nature of risks that the CIS is exposed to. Some of the respondents however raised the issue of operational challenges in applying the look-through approach as the allocation of exposures in the investment mandate may differ from how the risk requirements are structured.

5.73 MAS notes the operational challenges in applying the look-through approach based on actual allocation. However, MAS remains of the view that for the look-through

⁴² 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

⁴³ This approach is consistent with recent developments in other jurisdictions (e.g. European Economic Area, Canada, Australia) 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.

approach to be effective, it is essential that insurers establish the necessary processes to obtain the required information on their CIS assets as well as conduct the necessary validation checks in a timely manner. MAS will therefore **retain the proposal to apply the look-through approach as proposed in paragraph 5.71**. However, MAS is prepared to work with the industry to alleviate the operational challenges where the proposed method is prudentially sound.

Question 24. MAS seeks comments on the usefulness of the following approach and alternative suggestions on overcoming the potential operational challenges of a look-through approach.

Given the potentially significant number of holdings within a CIS, MAS is considering to allow for data grouping, so long as these are done in an appropriate and prudent manner, supported by adequate documentation.

For example, for CIS invested in debt securities, MAS will allow, in place of applying the required interest rate and credit spread risk factors on each and every single underlying debt security, a reasonable approximation based on an appropriate grouping of debt securities, where the calculations for the group will be done using the average characteristics of that group.

Countercyclical adjustment

5.74 In the second consultation paper, MAS explored introducing a countercyclical adjustment ("CCA") mechanism⁴⁴ to the proposed equity risk requirement factors to incorporate a countercyclical element within the overall equity risk requirement. CCA can help to reduce unintended and potentially detrimental pro-cyclical effects where onerous equity risk requirement during a market down cycle could lead to fire sale of equity assets, which may in turn impact the stability of financial markets.

5.75 There was general support for a CCA mechanism as it could prevent triggering of supervisory interventions during an economic downturn and ensure that the RBC 2 framework better reflects the underlying economics of the insurance business,

⁴⁴ CCA can be, but not necessarily limited to, an adjustment that could increase or decrease the standard equity risk factor, depending on the market environment. In particular, the adjustment should reduce capital requirements during financial distress. Currently, only Solvency II has a feature like this, i.e. equity symmetric adjustment.

especially the longer term nature of life insurance business. However, many respondents disagreed that the CCA should only apply to Singapore equities. They were of the view that it should be extended to all equities as the reaction to liquate assets during market shocks is not limited to Singapore equities. Restricting the use to only Singapore equities would also discourage diversification of equity investments and potentially compound systemic risk. Some respondents further suggested that the CCA be extended to all other market risk with mean reverting tendencies, for example, credit spread risk requirement⁴⁵.

5.76 One respondent advocated that the design of CCA should be supported by historical data. It would be acceptable for the CCA to be activated only on significant movements in risk driver readings, if historical data did not show strong reversion behaviour for mild changes in risk driver readings. Similarly, if supported by historical data, the CCA should be allowed to cause significant deviation from, or even completely negate, the base risk requirement of a risk module. One respondent rightly observed that best practices on CCA mechanism are still emerging and recommended for MAS to incorporate CCA at a later stage when the calibration methodology is more developed.

5.77 In response to the consultation paper, the SAS has set up a Countercyclical Working Party ("CCAWP") to conduct research into potential CCA for RBC 2. The CCAWP submitted their proposal on the scope, design and calibration of the CCA for both equity and credit spread risk requirements for MAS' consideration in Jan 2015. MAS noted from the research that it is a challenge to derive a CCA mechanism that could meet the various stated objectives consistently and reliably. There is also no guarantee that CCA would work well in the future, i.e. historical equity price movements on which the model was fitted may not be a good predictor of future movement. The proposed trigger also resulted in undesirable time lag⁴⁶, rendering the equity CCA less effective. This observation was also shared by the life industry players.

5.78 Nevertheless, MAS sees the merits of a reliable CCA mechanism and agrees with the industry that this is a good starting point, on which further work could be done. As also mentioned by one of the respondents, work on CCA mechanisms is still in its

⁴⁵ Interest rate mismatch risk requirement proposed under RBC 2 already has mean-reverting elements, as explained in paragraph 5.81 later.

⁴⁶ For example, during the global financial crisis in 2008/09, MSCI Singapore fell by 50% within 6 months. The proposed equity CCA would only kick in after 5 months, when MSCI Singapore had plunged by 48%. At the trough of the crisis in Feb 2009, where index had collapsed 60% from its peak, the CCA would only be - 8%.

nascent stage, and evolving. MAS will thus **continue monitoring developments in this area and exploring the study of a reliable CCA mechanism with the industry**. MAS' priority will however be on finalising the other features of RBC 2 for implementation first. We will consult on the CCA mechanism, if developed, at a later stage.

Interest rate mismatch risk requirement

5.79 Changes in market interest rates affect the prices of debt securities and 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. In the second consultation, MAS proposed to apply the same set of interest rate adjustments on both the insurer's debt securities and policy liabilities. Interest rate adjustments will be based on prescribed increasing and decreasing percentage changes rather than absolute changes. The interest rate mismatch risk requirement would be based on the interest rate scenario that would give rise to a bigger fall in net asset value.

5.80 The prescribed upward and downward interest rate adjustments would be applied to the risk-free yield curve⁴⁷. The interest rate adjustments, which already accounted for diversification benefits implicitly, would be subject to a maximum absolute interest rate adjustment of 200 basis points (based on historical observations of the SGS and US Treasury yield curves).

5.81 The proposed design has advantages over the current interest rate adjustments, which are based on absolute interest rate changes. First, the same set of interest rate adjustment is being applied to both the asset and liability yield curve, which is more consistent. Second, it is more reflective of the mean-reverting⁴⁸ behaviour of interest rates, which may not be recognised if absolute interest rate adjustments are used (under current RBC).

5.82 MAS recognises that it may not be adequate to just consider increasing and decreasing percentage changes of the yield curve. However, inclusion of more permutations in interest rate movements may make the computation of the risk requirement unwieldy. MAS intends to test the impact of other interest rate

⁴⁷ The risk-free curve after applying the interest rate adjustments is subject to a minimum of zero.

⁴⁸ Interest rate levels tend to have upper and lower bounds. For instance, 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.

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.

5.83 There was broad support for the interest mismatch risk requirement proposal from the life insurance industry as it would lead to a more consistent assessment of economic impact. However, there was also feedback that during QIS 1, significant implementation challenges were encountered for the revaluation of debt securities that contained issuer options. Value of such securities can be seen as the average value from all possible paths interest rate may take, where the issuer may exercise its rights differently in each path. One respondent suggested that MAS work together with the industry to review the methodology used to revalue debt securities with issuer options in interest rate risk mismatch risk calculation.

5.84 MAS acknowledges that the deterministic method prescribed under QIS 1 may not be suitable⁴⁹ for debt securities with embedded interest rate options (which is not that commonly held by the insurers). A more accurate mark-to-model valuation for such assets would be one that is stochastic in nature. MAS' longer term goal is to allow insurers to use stochastic mark-to-models (or option pricing models) for this purpose ultimately under RBC 2, subject to the relevant governance requirements and validation by the external auditors. In the interim, for the purpose of QIS 2, MAS proposes for insurers to **use the effective duration of such debt securities to compute the interest rate mismatch and credit spread risk requirements. MAS will work together with the industry to fine-tune the standardised approach.**

5.85 A number of general insurers requested MAS to consider using a simplified approach such as modified duration, instead of the discounted cash flow methodology. One respondent commented that the discounted cash flow method was too time-consuming and that in times of crisis, this may cause delay in risk and capital information for critical management decision.

5.86 MAS would prefer the discounted cash flow approach to be used as it provides the most accurate assessment of how changes in the term structure will affect the price

⁴⁹ In particular for boundary cases, upward interest rate movements may result in an under-estimation of the actual price movement, and downward interest rate movements may result in over-estimation of the actual price movement. This may also result in inconsistent treatment for a bond which moves from being in-the-money to out-of-the-money from one period to another.

of the asset. It also aligns how interest rate mismatch risk requirement is computed for both assets and liabilities. The use of modified duration has its limitations⁵⁰. However, given that it tends to be more conservative⁵¹, we propose **to give insurers the flexibility to apply the modified duration approach in calculating their interest rate mismatch and credit spread risk requirements**. MAS would expect life insurers with larger bond portfolio and more sophisticated asset valuation systems to utilise the discounted cash flow approach as it would generate more precise risk requirements, with potential capital savings. This simplification should benefit the general insurers that may not invest much in bonds, and may not be as familiar with the computations of cash flows.

Question 25. MAS seeks comments on the proposal to apply the same set of interest rate adjustments as shown in Diagram 17 below on insurers' debt securities and policy liabilities.

Interest rate adjustments will be based on prescribed increasing and decreasing percentage changes rather than absolute changes. The interest rate mismatch risk requirement will be based on the interest rate scenario that will give rise to a bigger fall in net asset value.

For clarity, the upward and downward interest rate adjustments in Diagram 17 are to be applied to the relevant yield curve.

The interest rate adjustments will be subject to a maximum absolute interest rate adjustment of 200 basis points.

⁵⁰ Using modified duration, as suggested by respondents, has two main shortcomings in that (i) it assumes a parallel shift in the yield curve, which would almost always not be the case based on prevailing yields and our prescribed adjustments and (ii) it does not capture higher order derivative of the price function such as convexity.

⁵¹ Use of modified duration may give more conservative results than the full cash flow discounting approach, as drop in asset values would be overestimated under a rising interest rate scenario. Under a decreasing interest rate scenario, a modified duration approach would also underestimate the gain in value of assets and liabilities when interest rate decreases.

Diagram 17: Table of proposed interest rate adjustments

Duration	3M	1Y	2Y	5Y	10Y	15Y	20Y+
<i>Upwards</i>	100%	100%	100%	90%	70%	50%	25%
<i>Downwards</i>	-75%	-70%	-70%	-60%	-40%	-30%	-25%

Question 26. MAS seeks comments on how interest rate shocks should be applied to the extrapolated segment of the discount curve (as discussed in Section 4), which will converge to the UFR. In determining the interest rate mismatch requirement under QIS 2, an adjustment of 25% is applied to durations of 20 years or more, which would include the extrapolated segment. Is this treatment appropriate? If not, how should interest rate shocks be applied?

Question 27. MAS seeks comments on the proposed approach as described in paragraph 5.84 for debt securities with embedded interest rate options.

Question 28. MAS seeks comments on giving insurers the flexibility to apply the modified duration approach in calculating their interest rate mismatch and credit spread risk requirements, as described in paragraph 5.86.

Recognising diversification between insurance funds

5.87 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. Hence in the second consultation, MAS proposed to recognise such diversification benefits⁵² between insurance funds (other than the Participating Fund) when calculating the interest rate mismatch risk requirement at the company level.

5.88 Under QIS 2, MAS will **continue to allow such diversification**.

⁵² 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

Moderation of calibration

5.89 The credit spread risk requirement under RBC 2 will capture the spread risks more explicitly. In the second consultation, MAS proposed to apply the following credit spread shock (expressed in basis points) in Diagram 18 to the debt portfolio, which takes into account diversification benefits implicitly.

Diagram 18: Table of credit spread shocks proposed in second consultation

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

**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.*

5.90 For avoidance of doubt, the credit spread risk requirement would also apply to the portfolio of policy liabilities that had been separately held under the MA proposal (mentioned in Section 4). Insurers would be required to revalue their debt securities and 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. Specific instructions were provided in the QIS 1 technical specifications.

5.91 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.

5.92 There was general feedback that the credit spread shocks were generally high, compared to other jurisdictions. Similar to the feedback received on the equity risk requirement, this may discourage investments in long-dated corporate bonds, even though the asset profile may be suitable for the long-term investment horizon of the insurers writing long-term business. Some respondents also provided feedback that the proposed credit spread shocks would lead to a "jump" in risk requirements from year 10 to year 11. In addition, some respondents suggested that the proposed credit spread

shocks be smoothed between the higher and lower duration buckets. One respondent suggested that MAS may want to consider a formulaic approach like what is used under Solvency II, to ensure a smoother credit shocks. However the same respondent added that the formulaic approach would result in complexity in calculation, and that MAS' proposed method was much easier to execute.

5.93 Given the consultation feedback, MAS has **moderated the credit spread shocks further**, to be more comparable with other jurisdictions' calibration, especially at the longer durations. MAS has also **smoothened the factors to ensure a gradual reduction in risk requirements** (risk requirement is approximately duration x proposed credit spread risk shock) as the duration shortens.

Question 29. MAS seeks comments on the proposal to apply the following credit spread shock (expressed in basis points) in Diagram 19 to the debt portfolio:

Diagram 19: Table of proposed credit spread shocks

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	105	120	165	245	405	540
Between 5 to 10 years	95	115	145	230	365	500
>10 years	90	95	125	215	355	475

Credit spread risk requirement will also apply to the portfolio of policy liabilities which have been separately held under the MA, albeit with some reduction will be prescribed⁵³.

Insurers will be required to revalue their debt securities and 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.

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.

⁵³ As mentioned in para 4.27, detailed specifications for the calibrated MA framework will be provided to the life insurers within one month after the issuance of this third consultation paper.

**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.*

Treatment of unrated bond issuances

5.94 Singapore insurers have been collectively holding on average of around 10 - 20% of their corporate bond holdings in the form of unrated SGD denominated issues for the past number of years, with a significant proportion issued by Singapore statutory boards. The rest of the unrated bond holdings are mostly issued by financially strong corporates that did not seek a rating.

5.95 Under the current RBC framework, bonds issued or fully guaranteed by Singapore statutory boards and recognised multilateral agencies⁵⁴ are treated as qualifying debt securities, similar with corporate bonds of investment grade. Else, unrated debt securities currently attract the same debt specific risk charge as that of non-investment grade debt securities.

5.96 With the introduction of an explicit credit spread risk requirement under RBC 2, where the prescribed credit spread shock will be more significant than the current debt specific risk charge, how unrated bonds are treated becomes more critical.

5.97 Recognising the high credit quality of these bond issuances despite their unrated status, MAS proposed in the second consultation that for corporate bonds issued by Singapore statutory boards and recognised multilateral agencies, the applicable credit spread shocks would be tied to the sovereign rating of the Singapore government, which is currently at "AAA". As for other unrated corporate bonds, a credit spread shock of between "BBB"- and "BB"-ratings was to be applied for unrated SGD issues. MAS also indicated that it would work with the industry on options to encourage rating of unrated corporate bonds.

5.98 Many respondents asked for a lighter treatment for issuances by Singapore statutory boards as well as government-linked entities such as Temasek Holdings. Several respondents further suggested that bonds issued by these entities be exempted from the credit risk charge as they have very low default risk and insurers have to invest

⁵⁴ As defined in Table 2 of the Sixth Schedule of the Insurance (Valuation and Capital) Regulations 2004.

in these bonds as substitutes for government bonds, given the lack of depth in the SGS market.

5.99 In view of the consultation feedback, MAS proposes that **for bonds issued by Singapore statutory boards, the credit spread shock to be applied would be 50% of that proposed for a "AAA"-rated corporate bond**. This is based on the empirical, albeit limited, evidence that shows that credit spreads of bond issuances by Singapore statutory boards did not spike as much during the global financial crisis, and was around half of the spreads observed for a "AAA"-rated corporate bond. MAS also proposes to **extend this treatment to bonds issued by recognised multilateral agencies. In the case for bonds issued by other government-linked entities such as Temasek Holdings, the applicable credit spread shock will still be based on the credit rating of these bonds**.

5.100 **For other unrated corporate bonds (including non-SGD issuances which are not that common), a credit spread shock of between "BBB"- and "BB"-ratings will apply.** Nonetheless, **if the unrated bonds exhibit features that are close to junk bonds, the insurer is expected to apply a higher risk charge for prudence.** MAS also reserves the right to impose a capital add-on should the unrated bonds held by the insurer be not of good quality.

Question 30. MAS seeks comments on the proposed treatment of unrated bonds as described in paragraphs 5.99 and 5.100 above.

5.101 A few options were explored on encouraging the rating of unrated bonds:

- a) One option was for industry to pool resources to engage rating/risk research institutes to rate the unrated bonds. This would help ensure a level playing field as all insurers will be using the same rating for the same bond. However, this did not gain much traction as not all insurers invest in unrated bonds to the same extent;
- b) Another option was to recognise the ratings by local rating agencies (including overseas issuances). Given that the standards of such local rating agencies can vary widely, MAS will monitor the developments on the IAIS global insurance capital standard with respect to the recognition of rating agencies; and
- c) The last option explored was the recognition of an insurer's own internal rating model. The industry (in particular, life insurers) preferred that the insurer's internal ratings of unrated bonds be recognised when computing the credit spread risk requirement calculations. To clarify, this is not an

internal model to derive the credit spread risk requirement, but rather to assign a credit rating to the bond based on the insurer's own assessment. This approach would avoid duplicating the expenditure insurers have already incurred to conduct such credit analysis. The industry further suggested that MAS may consider specifying the criteria for an admissible internal rating process, and have external auditors audit against those criteria annually before such internal ratings of unrated bonds can be used for risk requirement calculations.

5.102 MAS agrees that it will be useful **to have a set of criteria for an admissible internal rating process** so that insurers can gradually build up⁵⁵ their capabilities before the implementation of RBC 2.

Question 31. MAS seeks comments on the proposed criteria for the recognition of internal credit rating model for unrated bonds as set out in **Annex H**. The key criteria that MAS will focus on will be around oversight and control on the internal rating model, drawing useful and relevant references from MAS 637 for the banking sector, and also from some of the best practices observed in insurers.

Treatment of sovereign bonds, bonds issued by public sector entities and bonds with guarantees and collaterals

5.103 Currently, debt securities issued or fully guaranteed by central governments or central banks of countries or territories with a sovereign rating of investment grade⁵⁶ are exempted from the debt specific risk requirement (that is, the applicable debt specific risk requirement becomes zero). In the first consultation, MAS proposed 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.

5.104 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

⁵⁵ Preliminary assessment of the insurers' internal rating models shows that insurers still place quite a fair bit of reliance on the model provided by their fund manager.

⁵⁶ 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.

rated corporate bond issued by a private corporation. As such, **for debt securities issued by governments or central banks with a sovereign 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.** If it is not in the national currency of the country, these debt securities should be based on the sovereign credit rating.

5.105 There were no strong objections to the proposals. There was a comment that the proposal may lead to preference for foreign sovereign bonds relative to SGD corporate debt, with currency hedging. Another respondent did not agree with the proposal as it was of the view that there was technically no spread on sovereign bonds issued in the national currency. On the first comment, MAS expects insurers to make sound asset allocation decisions that meet the requirements under MAS Notice 125 on Investments of Insurers with respect to board and senior management oversight, processes and controls. MAS will also through its macroprudential surveillance, monitor for any shifts in the industry's investments. On the second feedback, we have seen how the bond yields of several countries with investment grade sovereign ratings can rise significantly due to higher perceived credit risk during crisis, e.g. Eurozone crisis. As such, **it is necessary to subject certain sovereign bonds to credit spread risk requirement.**

Question 32. MAS seeks comments on the following proposed approach for sovereign bonds.

- a) Only exempt the debt securities issued by governments or central banks of countries or territories with a sovereign credit rating of at least "A-" from the credit spread risk requirement.
- b) For debt securities that are issued by governments or central banks with a sovereign credit rating lower than "A-", these are subject to the credit spread risk charge module; however if these are in the national currency of the country, these can be notched up to the next higher credit rating when deriving the credit spread adjustment that should be applied under this module.

5.106 Given that we are imposing credit spread shock, albeit at a lower level, on bonds issued by Singapore statutory boards, it would be inconsistent if we exempt the bonds issued by the public sector entities (equivalent of our statutory boards in other countries) from the credit spread risk requirement even if they are fully guaranteed by the government or central bank of a sovereign credit rating of at least "A-".

Question 33. MAS seeks comments on the following proposed approach for bonds issued by public sector entities.

- a) For bonds issued by public sector entities that are fully guaranteed by a central government or central bank, insurers can use the credit rating of the sovereign ratings when deriving the credit spread shock.
- b) For unrated bonds issued by public sector entities that are not fully guaranteed by a central government or central bank, a credit spread shock of between "BBB"- and "BB"-ratings will apply.

5.107 Some respondents asked how bonds with guarantees or collaterals would be treated. MAS proposes to **recognise the credit risk mitigation effect where eligible guarantees and collaterals are used.**

Question 34. MAS seeks comments on the following proposed approach for bonds with guarantees or collaterals.

- a) For bonds with guarantees, insurers can use the credit rating of the guarantor, in place of the original obligor. The guarantees would need to fulfil certain criteria before they can be recognised. Such requirements include that the guarantee is explicit, unconditional, irrevocable and legally enforceable for the remaining term to maturity of the related asset.
- b) For bonds backed by collaterals, insurers can reduce the amount of credit exposure by the value of the collateral, adjusted by haircut.

The details are specified in the QIS 2 technical specifications.

Question 35. MAS seeks comments on whether the proposals relating to treatment of bonds issued by Singapore statutory boards and multilateral agencies, sovereign bonds, bonds issued by public sector entities and bonds with guarantees or collaterals are consistent.

Treatment of structured products

5.108 There are currently no explicit instructions or rules on the risk charging mechanism for structured products under the RBC framework. In the second consultation, MAS proposed to introduce explicit provisions on the risk charging

treatment for these types of investments. This would help to ensure that the calculated risk requirement is appropriate and suitable given the underlying risks of the structured product.

5.109 The proposed risk charging rules for structured products⁵⁷ were as follow:

- a) Counterparty default risk requirement would be applicable and would be computed based on the credit rating of the product offeror. Insurers were to apply the counterparty default risk charge to the market value of each structured product;
- b) Structured products would be subject to the following market-related risk requirements:
 - i. For credit-related structured products, the credit spread risk requirement would be applicable and based on prescribed credit spread shocks that were 60% higher⁵⁸ than the standard credit spread shocks used for calculating the credit spread risk requirement. Insurers would be required to revalue their structured product resulting from the upward basis point increase in credit spread to derive the credit spread risk requirement;
 - ii. For other types of structured products, insurers were to determine the appropriate market risk-related risk 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. Alternatively, insurers could choose to apply a flat 50%⁵⁹ risk requirement on the entire marked-to-market value of the investment;

⁵⁷ Structured products refer to investments that provide exposure to an underlying reference portfolio of assets or risks. Such risks can be in the form of any security, index, currency etc.

⁵⁸ The above credit 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. This is also consistent with what some other jurisdictions use.

⁵⁹ This was pegged to the equity risk charge of 50% for "Listed in Other Markets".

- c) Given the wide variability in the design of the structured products, insurers would be expected to maintain and provide sufficient evidence to demonstrate that the proposed allocation of market risk exposures of the structured product into the relevant risk modules is justifiable and reasonable.

5.110 A number of respondents requested for greater clarity over the definition of a structured product. One respondent highlighted that a structured product can be decomposed into different equivalent bundles of cash and derivative holdings, leading to different risk charges. There is hence a need to review the treatment of derivatives under RBC 2 before any discussion about decomposition can take place. Treatment of derivatives will be addressed in the next section.

5.111 MAS considers structured products as investments that provide exposure to an underlying reference portfolio of assets or risks. This typically takes the form of a tranching exposure and includes credit-related securitisation exposures and insurance-linked securities. Examples of these include residential mortgage-backed securities, asset-backed securities and catastrophe bonds.

5.112 On the market-related risk requirement, MAS noted that both Australia and Europe Economic Area apply credit spread risk requirement on all structured products where relevant, and not just confined to credit-related structured products. MAS therefore proposes to **make some slight refinements to the earlier proposed approach**.

Question 36. MAS seeks comments on the proposed approach of deriving the risk requirements for structured products.

The proposed risk charging rules for structured products are as follow:

- a) Counterparty default risk requirement would be applicable and would be computed based on the credit rating of the product offeror. Insurers are to apply the counterparty default risk charge to the market value of each structured product;
- b) Structured products would be subject to market-related risk requirements. In deriving such risk requirements, insurers could either:
 - i. Adopt a look-through approach and apply the relevant risk module (e.g. credit spread risk module). One common risk associated with structured products is a relative lack of liquidity due to the highly customised nature of the investment. To account for volatility and illiquidity risk of structured product, MAS proposes to then apply a 50% loading on the derived market risk

requirement; or

- ii. Apply a fixed 50% risk charge on the entire marked-to-market value of the investment (i.e. similar to equity risk charge for "Other Listed Equities").

Is the above approach appropriate? If not, please provide suggestions on alternate treatments.

Treatment of derivative instruments

5.113 Under the current RBC framework, MAS has prescribed the way in which the more basic⁶⁰ types of derivatives are to be risk charged. Insurers are given instructions on how to derive notional positions⁶¹ for different derivatives, which are then included in the computation of the risk requirement, where applicable.

5.114 Though we have not explicitly consulted on the topic of derivatives in the second consultation paper, we received feedback from a few respondents that it was necessary to review the risk charging treatment of derivatives. For example, for equity risk requirement under current RBC, the requirement is to compute both an equity specific and general risk requirement. However under RBC 2, the specific and general risk requirement is replaced with a single downward equity shock. This would have implication on how derivatives are to be risk charged.

5.115 MAS agrees that a review of the capital treatment of derivatives would be both necessary and timely under RBC 2. There have been developments on the banking side with respect to the treatment of derivatives since RBC was introduced. Basel III's revised framework for market risk capital requirements (which included the treatment of derivatives) has also been recently finalised in January 2016, and its impact being reviewed for the banking sector here. Hence it is opportune for MAS to review the capital treatment of derivatives in light of RBC 2 and banking developments, and promote consistency where appropriate across the banking and insurance sectors in Singapore.

⁶⁰ For less plain vanilla type of derivatives, which does not happen often, insurers would come to MAS on a case by case basis to clarify the risk charging treatment.

⁶¹ For example, paragraphs 2(2) (on how to 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 of the Insurance (Valuation & Capital) Regulations 2004.

5.116 MAS will **work with the industry on this review, to ensure that the proposed treatment is ultimately fit for purpose for the industry, given that the types of derivatives used by the insurers are often more plain vanilla, and the reasons for using derivatives may be different, as compared to the banks.** In the meantime, **an interim approach has been proposed for the purpose of conducting QIS 2.**

Question 37. MAS seeks comments on the proposed treatment of derivatives under QIS 2 as well as in future under RBC 2.

Property investment risk requirement

5.117 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.

5.118 In the second consultation, MAS proposed to apply the following factors to the market value of each property exposure to derive the property risk requirement:

- a) Immovable properties: 30%; and
- b) CIS invested in property assets for investment purposes: 35%

5.119 MAS further clarified that investments in companies engaged in real estate management or project development, or similar activities, should be considered as equity investments and not property investments.

5.120 A few respondents suggested having more granularity in the property risk requirement, so as to capture the differences in risk characteristics of different property types e.g. local and overseas, residential, office and retail. Some respondents also noted that the proposed treatment of CIS invested in property did not appear to be consistent with that for other CIS, for which a look-through approach could be applied.

5.121 While greater granularity confers higher risk sensitivity, the amount of data available for calibrating the property risk requirement is not as rich and comprehensive as that for equities. Given that property transactions are relatively infrequent, MAS is of the view that **having one broad category for property risk requirement is fit for purpose.**

5.122 MAS is also agreeable to **align the treatment for all CIS, regardless of the underlying investments.** Thus, in the case of CIS invested in property assets for

investment purposes, MAS will allow insurers to adopt a look-through approach, either based on actual allocation or investment mandate. Where the insurer chooses not to or is unable to adopt a look-through approach, a flat risk charge of 55% will apply.

Question 38. MAS seeks comments on the proposal to apply the following factors to the relevant market exposure:

- a) Immovable properties: 30%;
- b) CIS invested in property assets that are for investment purposes: Apply the same look-through approach as described under the earlier section on CIS. Where the insurer chooses not to or is unable to adopt a look-through approach, a flat factor of 55% will apply.

The property investment risk requirement is then taken as the aggregate of the calculations for all property exposures.

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.

Infrastructure financing

5.123 Insurers can be an important source of funds for infrastructure investments. In particular, life insurers are ideal long-term institutional investors given the long-term nature of their liabilities. The revenues of infrastructure projects can be less volatile as they provide in many cases essential services, have high barriers to entry or benefit from some kind of guarantee by a governmental body. They are also sometimes linked to inflation. The long-term nature of their liabilities allows insurers to have a longer time horizon than many other institutional investors. Many retirement products promise fixed payments. It is therefore natural to look to insurers as a potential source of infrastructure financing. They could in turn benefit by diversifying their holdings and earning illiquidity premia, which is helpful given a low yield environment.

5.124 There is increasing recognition that life insurers' role in long-term infrastructure financing is becoming more important, especially in Asia, where banking regulatory reforms may have crimped banks' appetite and ability to play a long-term financing role. The infrastructure needs in largely bank-based Asia are also continuing to grow; and governments are increasingly under strain to finance long-term infrastructure investments.

5.125 Globally, it is recognised that there is a need for policy makers to review the broader systemic and macroeconomic impact of regulatory changes on the provision of finance to support long-term investment⁶². In fact, G20, OECD and the industry are collaborating closely to facilitate long-term financing from institutional investors which include insurers. The regulatory treatment for insurers has to evolve so as to make possible long-term investments, including infrastructure financing. Increasingly more insurance regulators recognise that the design of the capital framework has impact beyond individual insurers to real economy, and are looking into how the capital frameworks can be fine-tuned to support long-term investments. For example, EIOPA has recently consulted on a more favourable treatment for certain long-term investments including infrastructure financing under Solvency II. This included having separate risk categories for debt and equity infrastructure investments.

5.126 In assisting insurers to find suitable long-term assets to meet liabilities, MAS will first continue to work on developing the supply and depth of long-dated bonds. As part of this, MAS will **conduct another round of a more detailed bond survey after the release of this consultation, to assess insurers' demand for long-dated Singapore government securities and corporate debts under current RBC 2**. Second, MAS will **assess the demand for infrastructure financing by our insurers and explore designing an appropriate yet prudentially sound capital treatment for such assets under RBC 2**. We have not designed a separate risk module for infrastructure asset class under RBC 2 at this point. This is because we are still at a stage of refining our calibration for the main asset classes, and our insurers have also not yet invested in infrastructure financing in a material way.

Question 39. MAS seeks views on the questions set out in **Annex I** to better understand the specific types and characteristics of infrastructure financing that our insurers may be keen on, the appropriate capital treatment for such investments, and the data available to back the proposed treatment.

⁶² Group of Thirty report on Long-Term Finance and Economic Growth 2013 The report can be accessed at http://group30.org/images/uploads/publications/G30_LongtermFinanceEconGrowth.pdf

Foreign currency mismatch risk requirement

5.127 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 SIF.

5.128 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. The concession of 10% was given in view of industry feedback that there was a lack of supply and liquidity of SGD denominated assets⁶³ when RBC was first introduced in 2004.

5.129 In the second consultation, MAS proposed to impose a foreign currency mismatch risk factor of 12% to both the SIF as well as OIF. MAS also proposed to remove the current 10% concession for SIF. This is because there is now a greater supply⁶⁴ and liquidity of SGD denominated assets available to provide the currency match for insurers' SIF SGD denominated policy liabilities, as compared to 2004, when RBC was first introduced.

5.130 In the case of OIF, a concession of 20% of the total value of fund assets would apply for the OIF when computing the foreign currency mismatch risk requirement.

5.131 Many respondents did not consider it appropriate to remove the 10% concession for SIF. In particular, the respondents pointed that whilst there had been an increase in the issuance of SGD corporate bonds since 2004, the demand continued to outstrip supply. In addition, one respondent highlighted that a large portion of SGD corporate bond issued may not be suitable for insurers. For example, issues may not match the insurer's long-term investment horizon, do not have the appropriate credit quality ratings, or do not provide sufficient yield to meet the insurer's liabilities

⁶³ In particular, the debt securities, but same observation could be made of SGD denominated securities in other asset classes.

⁶⁴ SGD debt issuances had almost doubled between 2004 and 2012. Insurers could also choose to enter into derivative contracts to hedge their foreign currency exposures.

requirement. Another respondent also commented that the use of foreign exchange derivatives was not without cost.

5.132 The life insurance industry also added that the 10% concession served other purposes as well. First, supporting Singapore population's savings/ retirement goals requires attractive investment returns. The 10% concession facilitates insurers' search for better yield through global investment exposures. Additionally, insurers usually do not effect currency hedges for equities. Removing the concession may induce life insurers to move their existing overseas equity investments to Singapore to conserve capital, thereby creating concentration risk in the life insurance industry. In the event of a major downward movement in the Singapore stock market, it might lead to pro-cyclical selling.

5.133 There was support from a respondent who felt that where a currency mismatch exists between an insurer's assets and liabilities, the insurer should be required to hold capital against the resulting currency mismatch risk, regardless if the mismatch is the result of an intentional strategy or the consequence of a structural constraint.

5.134 A few respondents felt that the proposed risk charge was high and some diversification between different currencies should be allowed for. This would be addressed under the re-calibration. In general, there was no objection to the proposal to extend foreign currency mismatch risk requirement to OIF.

5.135 Two respondents commented specifically on the design of the foreign currency risk requirement. As the foreign currency mismatch risk requirement was computed on insurers' exposures in non-SGD currencies, it encouraged insurers to maintain surpluses in SGD, which might not be ideal. One of the respondent highlighted that holding surpluses in SGD would generate additional unwanted foreign exchange risk exposure for insurers whose functional currency was not SGD. The same respondent recommended that assets and liabilities in the functional currency of insurers be excluded from such computation for better alignment of economic exposures with capital risk requirements. The other respondent felt that where liabilities are in non-SGD currency, it is sensible for insurers to hold part of their surpluses in the corresponding currency in order to protect against a double hit of increasing liabilities and adverse currency movements.

5.136 MAS acknowledges the industry's comments that the supply-demand gap in SGD-denominated assets may not have sufficiently narrowed since 2004. Hence, MAS will **retain the 10% concession for SIF**. Given general support for the proposal, MAS will also **extend the foreign currency mismatch risk requirement to OIF, with a 20%**

concession. Insurers will still be expected to compute the foreign currency mismatch exposures that fall within the concession.

5.137 In the case where the functional currency of an insurer is not SGD, MAS agrees that the risk requirement should be computed based on foreign exchange exposures denominated in currencies that are not the insurer's functional currency. Given that such cases are not that common, MAS proposes to **continue with the current practice of granting exemption on a case-by-case basis, with flexibility to request the insurer to compute its foreign currency mismatch risk requirement on a different risk factor** (given that the calibration was done using SGD as the base currency).

Question 40. MAS seeks comments on the proposed approach with respect to foreign currency mismatch risk requirement.

- a) Impose a foreign currency mismatch risk charge of 12% to both the SIF as well as the OIF;
- b) Maintain the current 10% concession for SIF;
- c) Introduce a concession of 20% of the total value of fund assets for OIF;
- d) Require insurers to report on the foreign currency mismatch exposures, even though they may fall within the concessions.

Question 41. MAS seeks comments on the approach as described in paragraph 5.137 above, where the functional currency of an insurer is not in SGD.

Counterparty default risk requirement

5.138 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. 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.

5.139 All these risk modules ultimately make reference to a similar counterparty risk factor (which differentiates by credit rating) (see [Diagram 20](#)), though some other additional factors are applied.

Diagram 20: Proposed factors used for various counterparty default risk modules

Risk Module	Applicable Risk Charge	Other Notes
Loan Investment Risk Requirement	8% x Counterparty Risk Factor ⁶⁵	
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, agents' balances and other receivables due	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%	

⁶⁵ Counterparty Risk Factor is as set out in Table 11 of the Sixth Schedule of the Insurance (Valuation and Capital) Regulations 2004.

Risk Module	Applicable Risk Charge	Other Notes
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

5.140 In the second consultation, MAS proposed to streamline the risk requirements relating to counterparty default. The following risk requirements will be grouped under the new counterparty default risk requirement⁶⁶:

- Loan Counterparty
- Derivative Counterparty
- Reinsurance Recoverable Counterparty
- Outstanding Premiums Counterparty (includes agents' balances and other receivables due)
- Bank Deposit Counterparty
- Any other counterparty risk

5.141 MAS also proposed to simplify the computation of the counterparty default risk requirement⁶⁷ by making reference to same calibrated factors in a common table⁶⁸ (Diagram 21).

⁶⁶ Reporting wise, insurers will still be required to show the breakdown of the counterparty default risk requirement into the various sources above.

⁶⁷ The risk exposures for all the various risks will remain the same as that prescribed in the Insurance (Valuation and Capital) regulations 2004.

⁶⁸ 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.

Diagram 21: Table of proposed counterparty default risk charges

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

5.142 For reinsurance recoverables and outstanding premiums for direct insurance and facultative reinsurance business, the table above would only be applicable for exposures that are of one year or less. Exposures that are outstanding for over one year would attract a 100% risk charge. For treaty reinsurance business, the table above would be applicable for reinsurance recoverables and outstanding premiums that are outstanding for two year or less. Exposures that are outstanding for over two years would attract a 100% risk charge.

5.143 In addition, unrated counterparties that are insurers (including reinsurers) would be treated as having a rating of “CCC+ and below”, i.e. a default risk charge of 48.5% would apply. Unrated counterparties that are persons⁶⁹ other than an insurer (including reinsurer) would be treated as having a credit rating of between “BB- to BB+” and “BBB- to BBB+”, i.e. a default risk charge of 7.75% would apply.

5.144 There were no objections received on the table of factors in Diagram 21. Therefore MAS will **continue to adopt these factors under RBC 2**.

Treatment of unrated corporates

5.145 One major feedback received from a number of respondents was that the risk charge for premium receivables and outstanding balances due from unrated corporate counterparties was too stringent at 48.5%. The respondents highlighted that whilst the counterparties are unrated, it does not suggest that they are of poor creditworthiness.

⁶⁹ 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.

For example, reinsurers, agents and brokers are regulated entities with their financial soundness assessed. Some respondents were of the view that these entities should be accorded the same treatment as unrated individuals (i.e. attracting a 7.75% risk charge instead).

5.146 On the treatment for reinsurance recoverables, MAS acknowledges the merits of the respondents' argument that reinsurance counterparties are licensed insurers subject to regulatory purview and they should hence not be treated akin with corporates with rating of "CCC+ and below". We further note that the current RBC framework accords unrated corporates with a more favourable treatment by grouping them in the same Counterparty Risk Class as corporates with S&P rating of worse than "BBB-" but no worse than "B-". MAS thus proposes **to retain the spirit of the current treatment, that is, to not treat unrated entities as having a rating of "CCC+ and below"**. Instead, MAS proposes to **treat unrated entities as having a rating of between "BB- to BB+" and "BBB- to BBB+" and a default risk charge of 7.75% will apply, consistent with how unrated debt securities are treated.**

5.147 For outstanding premiums and agents' balance, MAS agrees that unrated corporate policyholders should not be treated worse off than individual policyholders. MAS also notes the respondents' comments that there might be valid reasons why corporate policyholders and agents have not obtained a credit rating, such as scale of operation. Agents or insurance intermediaries are also subject to some form of regulatory purview. MAS hence proposes to **treat outstanding premiums and agents' balances from unrated persons (both individuals and companies) consistently i.e. 7.75% risk charge will apply.**

Question 42. MAS seeks comments on the proposed treatment for unrated corporates when deriving counterparty default risk requirement as described in paragraphs 5.146 and 5.147.

Question 43. MAS seeks comments on whether the counterparty default risk charge for outstanding premiums should be linked⁷⁰ to the credit rating of the policyholder or cedant. Is credit rating as relevant in determining the counterparty default risk requirement for outstanding premiums as it is for other modules like loan, derivative

⁷⁰ Under the current RBC framework, the risk charge for outstanding premiums is independent of the credit rating.

counterparty and reinsurance recoverables? Please explain your response and provide alternative suggestions on how the risk charge for outstanding premiums should be determined otherwise.

Ageing of reinsurance recoverables

5.148 As mentioned in paragraph 5.142, for direct insurance and facultative reinsurance business, reinsurance recoverables exposures that are outstanding for more than a year would attract a 100% risk charge. For treaty reinsurance business, reinsurance recoverables exposures which are outstanding for more than two year would attract a 100% risk charge.

5.149 One respondent suggested a graduated approach for duration of below one year to reflect the risk associated with duration, while a few respondents questioned the need for different treatment between treaty and facultative business.

5.150 Given that reinsurance recoverables are amounts due from the reinsurer for claims already paid, there is no reason to distinguish between the ageing of treaty or facultative reinsurance. For good credit management, an insurer should attempt to recover any amounts due from its reinsurer as soon as possible; it seems implausible that an insurer have reinsurance recoverables outstanding for more than a year. We also note that typically, the insurer will net off any outstanding reinsurance recoverables from the premiums to be paid to the reinsurer in the following year. As such, MAS proposes to **remove the distinction between reinsurance recoverables from facultative and treaty reinsurance, with a 100% risk charge to be imposed on exposures that are outstanding for more than a year.**

Question 44. MAS seeks comments on the proposal to impose a 100% risk charge on reinsurance recoverables exposures that are outstanding for more than a year, regardless of whether it is for treaty or facultative reinsurance.

Ageing of outstanding premiums and agents' balances

5.151 Currently under the RBC framework, ageing starts from policy commencement date for direct insurance business and accrual date for reinsurance business.

5.152 Following feedback from direct general insurers, MAS will be testing the impact of changing the ageing definition for direct insurance business to billable date⁷¹ instead under QIS 2, as the current definition is too stringent for multi-year contracts (where risk charging begins from policy commencement date even though the premiums are not due).

5.153 MAS also sought the reinsurance industry's views on whether the same ageing definition should be used for reinsurance business, in the case where the premiums are non-estimates and billable. For pipeline premiums which are estimated and not due for billing, MAS had proposed to remain status quo, i.e. ageing still based on accrual date. There was no consensus from the reinsurance industry on the treatment. MAS will **continue to engage the industry on this**. For the purpose of QIS 2, MAS proposes to **remain status quo on the ageing of outstanding premiums for reinsurance business i.e. to continue ageing outstanding premiums for reinsurance business based on accrual date**.

Question 45. MAS seeks views on the ageing of outstanding premiums and agents' balances.

- a) What should be the ageing definition for reinsurance business? Should a distinction be made on whether the premiums are based on estimates or billable date?
- b) In the first consultation, MAS proposed to impose a 100% risk charge for outstanding premiums that are outstanding for more than a year for facultative reinsurance, and outstanding for more than two years for treaty reinsurance. Is this ageing structure appropriate? Should it be differentiated by whether the premiums are based on estimates or billable date, rather than whether it is facultative or treaty reinsurance business? Please explain your response.

⁷¹ Billable date refers to the date which part or all of each premium can first be billed without taking into consideration of any credit period given. For example, in the case of an annual paying policy with an inception date of 1.1.2016, the premium will be considered billable on 1.1.2016, 1.1.2017 etc. regardless of whether insurers may send the bill to policyholders earlier or later. Similarly, for a monthly paying policy with an inception date of 1.1.2016, the premium will be considered billable on 1.1.2016, 1.2.2016, 1.3.2016 etc.

Use of collaterals

5.154 A few respondents suggested that the counterparty default exposure should be determined net of collateral. In particular, two respondents requested to recognise letters of credit as acceptable collateral and that for reinsurance counterparty, to allow outstanding premiums to offset reinsurance recoverables.

5.155 Under the current RBC framework, collaterals meeting certain conditions are allowed to reduce the credit default exposure for loan and derivative counterparty risk requirements, subject to certain haircuts in value. Given that collateral effectively serves as protection for an insurer against default by its counterparty, there is no reason why the same treatment should not be extended to other cases where the insurer is exposed to risk of default by its counterparty. MAS therefore proposes that **the insurer may reduce the counterparty default exposure by the amount of any acceptable collateral held by the insurer where acceptable collateral shall have the following value:**

- a) In the case of cash or cash value of a policy, 100% of its value;
- b) In the case of a letter of credit meeting certain specified criteria, and
 - i. there exists no currency mismatch between the letter of credit and liabilities, 100% of its value;
 - ii. currency mismatch exists between the letter of credit and liabilities covered, 88%⁷² of its value;
- c) In the case of a security issued by a government or a public authority, 95% of the current market value of the securities;
- d) In the case of a security listed on a securities exchange, 70% of the current market value of the securities; and
- e) In any other case, zero.

Question 46. MAS seeks comments on the proposal to allow the insurer to reduce its counterparty default exposures by the amount of acceptable collateral, subject to the haircuts described in paragraph 5.155 above.

⁷² Which is 100% less 12%, the foreign currency mismatch risk requirement proposed under RBC 2.

Treatment of bank deposits

5.156 Some respondents commented that the risk charge on cash held in bank deposits was too high and not commensurate with actual risk. Under the current RBC framework, deposits with a bank or deposit-taking institution, which has a credit rating of at least investment grade and can be unconditionally withdrawn within 6 months of the date of computation of the total risk requirement, attracts a risk charge of 0.25%.

5.157 MAS agrees that a deposit that can be withdrawn unconditionally anytime presents a lower risk and the existing treatment is more appropriate. As such, MAS proposes that **deposits with a bank or deposit-taking institution that can be unconditionally withdrawn within 6 months of the date of computation of the total risk requirement be subject to half of the default risk charge proposed.**

Question 47. MAS seeks comments on the proposal that deposits with a bank or deposit-taking institution that can be unconditionally withdrawn within 6 months of the date of computation of the total risk requirements be subject to the charges set out in Diagram 22.

Diagram 22: Table of revised counterparty default risk charges for deposits

Types of Deposits	Rating	Default Risk Charge (%)
Deposits with banks or deposit taking institutions that can be unconditionally withdrawn within 6 months of the date of computation of the total risk requirement	AAA	0.25
	From AA- to AA+	0.5
	From A- to A+	1.0
	From BBB- to BBB+	2.5
	From BB- to BB+	5.75
	From B- to B+	10.0
	CCC+ and below	24.3
All other deposits with banks or deposit taking institutions	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

C3 requirements

5.158 Currently, any part of the value of assets within an insurance fund that exceed the specified concentration limits set out in the Insurance (Valuation and Capital) Regulations will be subject to 100% risk requirement. In practice, insurers try to diversify their assets amongst the counterparties to minimise the C3 requirement. Consequently, this risk requirement is typically negligible, if not, absent.

5.159 In the second consultation, MAS asked about the additional safeguards that could be introduced to minimise the risk of using a concentrated asset portfolio to meet the liabilities and risk requirements, other than imposing hard concentration limits, as in the case for banks.

5.160 A few respondents did not think that it was necessary to impose hard concentration limits. Suggestions include:

- Introduction of investment guidelines which define tolerable concentrations, distributions and asset mix;
- Insurers to conduct impact study of counterparty default of its largest exposure to draw attention to the level of asset concentration risk;
- Introduction of "prudent person principle"⁷³ in the insurers' overall governance framework as this principle will lead insurers to consider the amount of concentration risk they are prepared to take; and
- Insurers to come up with a concentration risk policy that determines (a) how concentration risk is measured; (b) concentration limits; (c) likelihood of contagion between concentrated exposures; and (d) management action required. In addition, insurers are required to establish an internal process to report their top exposures and any breaches to their internal limits.

5.161 Insurers are already required to consider the risk which may arise through concentrations and large exposures as part of the ERM requirements introduced by

⁷³ Prudent person principle is defined under Solvency II as a legal rule requiring investment advisers to only make investments for their clients that a prudent person would make. It does not require that the investment adviser always makes the correct decisions, but merely requires him or her to make decisions that will generally be accepted as sound for someone of average intelligence.

MAS. In fact, most of the above safeguards suggested by the respondents are part of the ERM expectations. MAS will continue to rely on the current regulatory and supervisory framework to monitor insurers' exposures to counterparties and take any supervisory action if necessary. MAS will therefore **not impose further requirements (e.g. hard limits like for banks) to deal explicitly with concentration risk.**

5.162 A few respondents have raised concerns with the current approach of addressing concentration risk, which is akin to holding 100% risk requirement for the value of assets in excess of the specified limits. They are of the view that a 100% risk requirement translates into a greater than 100% risk requirement as they are expected to maintain a fund solvency ratio of greater than 100%. Therefore, for every dollar of assets that exceeds the concentration limit, the insurer is effectively holding more than a dollar of capital. The respondents proposed removing the C3 risk requirements and instead, deduct assets holdings which exceed the prescribed concentration limits from the financial resources.

5.163 Some respondents also indicated preference for the determination of asset concentration to be changed from insurance fund to company level. This is because considering concentration on a fund level often inhibits efficient capital management for small and volatile insurance funds such as investment-linked fund. Given the small size of non-unitised assets within the investment-linked fund, it is relatively easy to breach the asset concentration limit.

5.164 Imposing the limits at an insurance fund level would help to ensure that there are sufficient assets to meet the corresponding liabilities of each fund respectively and avoid the situation of having concentrated assets in certain funds (e.g. participating fund), thereby putting policyholders at a greater risk. However, MAS is prepared to **explore more latitude in how the concentration limits are being applied, without compromising prudential concerns.**

Question 48. MAS seeks comments on the proposal to remove the C3 risk requirements, and instead, deduct asset holdings which exceed prescribed concentration limits from the financial resources. The deductions would be made from Common Equity Tier 1 capital.

Question 49. MAS seeks comments on the approach to explore more latitude in how the concentration limits can be applied. Under QIS 2, MAS will test the impact of applying the concentration limits at the following levels, consistent with paragraph 3.11:

- SIF – Par

- SIF – Others
- OIF – Par
- OIF - Others

For avoidance of doubt, MAS will also test the impact of applying the concentration limits at an insurance fund level.

Operational risk requirements

5.165 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 frameworks.

5.166 MAS is of the view that operational risk is a relevant and material risk that should be addressed in the capital framework. 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 in the second consultation:

x% of the higher of the 3 years' average of:

a) Gross written premium income; and

b) Gross (of reinsurance) policy liabilities,

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

The operational risk requirement is subject to a cap of 10% of the total risk requirements (after applying the diversification benefits but excluding the operational risk requirement itself, to avoid circularity in computation)

5.167 A number of respondents felt that the charges were too high, despite the cap. Specifically, most respondents felt that the 4% factor applied to gross policy liabilities was too stringent, especially for insurers with long-term business (i.e. life insurers). One respondent highlighted that new business exposes an insurer to greater operational risk in terms of market conduct, product development, system implementation etc. compared to in-force business, hence a lower factor should be applied to the gross

policy liabilities compared to earned premium income. Some respondents felt that the factor should also be set lower to allow for Pillar 2 adjustment, that is an insurer-specific capital adjustment based on a supervisory assessment of the ERM framework of the particular entity.

5.168 Similar to some of the feedback received from the first consultation paper, quite a number of respondents proposed to address operational risk via risk management framework instead of imposing an explicit capital charge. The main reasons being that the design of the operational risk requirement makes no distinction⁷⁴ between a well-managed insurer versus another poorly-managed insurer, and such a volume-based formula penalises insurers for growth. One respondent further commented that using gross premiums and policy liabilities seems to suggest that single premium/longer-term plans have higher operational risk than regular premium /shorter-term plans.

5.169 However, there were also many respondents who agreed that an explicit simple risk charge approach is sensible and provides the right signalling of the importance of operational risk. Many small to medium-sized insurers are likely to make use of the regulatory basis for their own economic capital calculations as it may not be feasible to independently develop a full economic model. Hence they felt that having an operational risk requirement within the regulatory capital framework is useful.

5.170 Given the consultation feedback, MAS is of the view that though operational risk can be addressed under the ERM framework, a quantitative and qualitative assessment would still be needed to determine the amount of capital add-on for operational risk. The assessment would need to consider the quality of data for calibration as well as requiring expertise and resources to check and validate the modelling of operational risk. Given that modelling of operational risk via own economic model is still an evolving area where there is a lack of operational loss data and no established practices internationally, MAS proposes to introduce an operational risk requirement under the standardised approach in the interim. MAS agrees that it is useful to **have an explicit risk requirement to signal the importance of this risk, especially given that most insurers still rely on regulatory capital.**

⁷⁴ Though it must be highlighted that the other risk requirements do not take into account the insurers' own risk management standards as well, given that a standardised approach for computing risk charges is being used.

5.171 The formula for operational risk requirement has been moderated in view of the consultation feedback. A different and lower factor is now applied to the policy liabilities base. In addition, to avoid penalising growth, MAS has **put in a threshold to capture only excessive growth as well as retaining the cap of 10% of the TRR**. The revised formula is consistent with what is observed in some of the other major jurisdictions like Australia, Canada and Europe.

Question 50. MAS seeks comments on the following formula for calculating the operational risk requirement, subject to a cap of 10% of the TRR (after applying the diversification benefits but excluding the operational risk requirement itself, to avoid circularity in computation):

The higher of

- a) $4\% \text{ of } GP_1 + \text{Max}(0, 4\% * ((GP_1 - GP_0) - 20\% * GP_0))$; or
- b) 0.5% of gross (of reinsurance) policy liabilities

where

GP_1 refers to the gross written premium income for the 12 months preceding the valuation date; and

GP_0 refers to the gross written premium income for the 12 months preceding GP_1

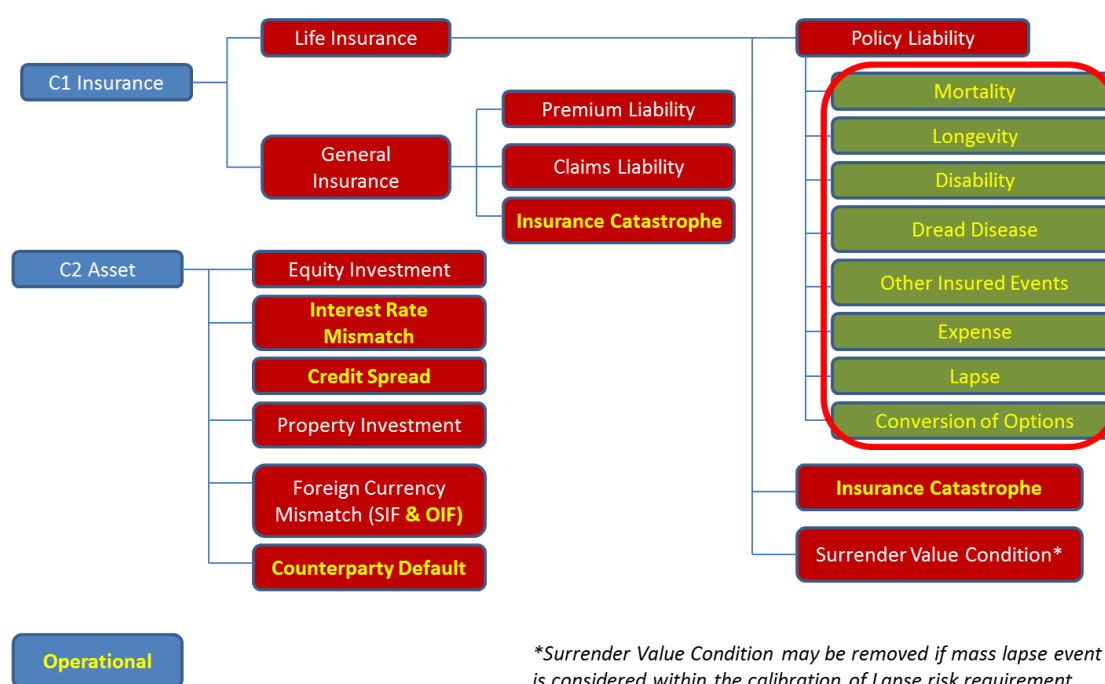
5.172 MAS will work with the industry and SAS to explore collecting relevant operational risk data to enhance future risk calibration of the standardised approach. MAS will also **continue to monitor the developments on the calibration of the operational risk requirement, and work with the industry and SAS in moving towards a more Pillar 2-based risk-sensitive operational risk requirement in the longer term**. For example, for larger insurers that use internal economic capital models for operational risk assessment, MAS may adopt a Pillar 2 approach to assess the appropriate operational risk capital requirement for such an insurer, taking into consideration its internal models and controls. Smaller or mid-sized insurers will continue to use the standardised simple formula to compute their operational risk capital requirements. In all cases, MAS may impose a capital add-on for operational risk if MAS has specific concerns over the insurer's operational risk management and controls.

Question 51. MAS seeks comments on the approaches outlined in paragraph 5.172 above. Please provide details on how a Pillar 2 approach should entail if MAS were to consider this in the longer term.

Revised organisation of risk modules

5.173 With the above proposed changes in this section, the risk modules under the proposed RBC 2 will be as set out in Diagram 23.

Diagram 23: Revised organisation of risk modules for current consultation



6 Components of Available Capital

6.1 The amount of capital available to meet the TRR is referred to as financial resources under the RBC framework. Financial resources at the company level comprise 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 that 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 ratio⁷⁵ of the insurer is not greater than its adjusted ratio⁷⁶.

6.2 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,

⁷⁵ Unadjusted capital ratio, or CAR, is the ratio of total financial resources to TRR.

⁷⁶ Adjusted capital ratio, or adjusted CAR, is the ratio of financial resources (excluding financial resources relating to participating fund) to TRR (excluding TRR relating to participating fund).

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 aims to implement a consistent regulatory and supervisory framework for financial institutions, where appropriate, to address the risks that they undertake.

Consistency with capital frameworks for banks

6.3 Since the introduction of RBC in 2004, there have been developments⁷⁷ in the capital framework for banks. MAS conducted a more comprehensive review of the components of available capital for insurers against the revised MAS Notice 637 on Risk Based Capital Adequacy Requirements for Banks Incorporated in Singapore and proposed promoting consistency in the following areas in the second consultation.

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

6.4 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

6.5 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.

6.6 In the second consultation, MAS proposed to introduce a new category of CET1 capital for licensed insurers incorporated in Singapore consisting of the following items:

- a) Surplus of insurance funds (excluding Participating Fund);
- b) Surplus account of the Participating Fund;
- c) Surplus of overseas branch operations;

⁷⁷ MAS Notice 637 on Risk Based Capital Adequacy Requirements for Banks Incorporated in Singapore has been amended a few times 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.

- d) Paid-up capital; and
- e) Retained earnings (currently known as unappropriated profit or loss);

less the aggregate of reinsurance adjustments of all insurance funds, any financial resource adjustments and any adjustments for asset concentration (as mentioned in the section on C3 Requirements earlier).

6.7 No objections were received during the consultation on the introduction of CET1 capital for insurers. As such, MAS will **introduce CET1 capital under RBC 2**.

Renaming and Reclassification

6.8 After CET1 capital, 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 nor 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 point⁷⁸.

6.9 Tier 2 capital instruments are subordinated to depositors and general creditors of the bank, and do not have any provision that creates incentives for the bank to redeem the instruments⁷⁹.

6.10 In view of the changes to MAS 637, MAS proposed the following changes in the classification and definition of the available capital components for insurers in the second consultation:

- 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

⁷⁸ Please refer to paragraph 6.2.2 of MAS 637 for the minimum requirements for AT1 capital instruments.

⁷⁹ Please refer to paragraph 6.3.2 of MAS 637 for the minimum requirements for Tier 2 capital instruments.

capital, provided they meet the criteria for AT1 capital instruments set out in Section 3 of Annex C of the second consultation paper;

- c) Rename Qualifying Tier 2 capital as Tier 2 capital; and
- 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 of the second consultation paper.

6.11 MAS also proposed in the second consultation paper 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 the paper. 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.

6.12 No objections were received during the consultation on the above proposals. In fact, a number of respondents welcomed the removal of the approval regime. MAS will therefore **proceed with the above proposals under RBC 2**.

6.13 During the second consultation, MAS also set out the transitional arrangements for the capital instruments which have been approved by MAS before RBC 2 implementation date. One respondent asked that capital instruments approved before RBC 2 implementation be grandfathered instead of being phased out under the proposed transitional arrangement. Given that the capital instruments that MAS has approved to date are already largely consistent with the proposed RBC 2 requirements, **MAS will allow the grandfathering of previously approved capital instruments**.

6.14 **Annex J** summarises the definitions of Tier 1 and Tier 2 capital under RBC 2.

Minimum floors on CET1 and Tier 1 capital

6.15 Currently, there are limits⁸⁰ on the amount of certain Tier 1 or Tier 2 capital components that can be recognised as financial resources. These limits are expressed as

⁸⁰ These are (i) sum of Irredeemable Non-cumulative Preference Share and Approved Tier 1 \leq 30% of Tier 1 Resource, (ii) Approved Tier 1 \leq 15% of Tier 1 Resource; (iii) Tier 2 \leq Tier 1; and (iv) Qualifying Tier 2 \leq 50% Tier 1 Resource.

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.

6.16 In the second consultation, MAS proposed to introduce following floors⁸¹ on CET1 and Tier 1 capital:

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

6.17 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 floors⁸². Instead, the floors will be set as a percentage of the total risk requirements, excluding the Participating Fund.

6.18 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.

6.19 A few respondents mentioned that the floor on CET1 capital is higher than other jurisdictions or higher than banking requirements. Two of the respondents further suggested that the floor on CET1 capital to be lowered to 60%. One respondent also mentioned that the level of the CET1 and Tier 1 capital floors would pose challenges to insurers given the drastic increase in capital requirements under RBC 2. However, there were also a few respondents that provided feedback that the proposed floors are appropriate and reasonable. A few respondents also agreed that using the total risk

⁸¹ 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 the previous footnote.

⁸² 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.

requirements as the basis to determine the floors is a better approach compared with the existing RBC limits.

6.20 The CET1 and Tier 1 capital floors are unlikely to pose a challenge as suggested above by one of the respondent, as insurers would need to ensure that the total available capital is at least 100% of TRR at all times. For insurers that do not issue any AT1 or Tier 2 capital instruments (which is the case for most insurers), their financial resources would comprise entirely of CET1 capital and applicable regulatory adjustments⁸³. The specified floor for CET1 capital is therefore unlikely to be breached before the insurer breaches the capital adequacy requirements (i.e. before CAR drops below 100%). This is the case even for the few insurers that have issued AT1 or Tier 2 capital instruments.

6.21 However, in view of the feedback, MAS is prepared to moderate the level of the CET1 capital floor. MAS will **lower the floor for CET1 capital from 65% to 60% of TRR**, to be more consistent with another insurance jurisdiction that has this requirement. **The floor on the Tier 1 capital will remain at 80% of TRR, as proposed in paragraph 6.16.**

Principal Loss Absorption ("PLA") feature

6.22 Recent developments in the capital framework for banks have strengthened the loss absorption capacity of capital instruments 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 point⁸⁴.

6.23 In the second consultation, MAS proposed to incorporate a PLA feature for AT1 capital instruments. This means that the 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 level.

⁸³ Such as aggregate of allowances for provision of non-guaranteed benefits ("APNGB") of participating funds and certain recognised portion of negative reserves.

⁸⁴ Please refer to paragraph 6.2.2(m) of MAS 637 for more information on the PLA feature.

6.24 A significant breach of CET1 capital level is defined as the level where CET1 capital drops below 70% of the TRR (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. A consultation question was posed as to whether the trigger point for the proposed PLA feature was appropriate.

6.25 A number of respondents agreed that the proposal was fair and appropriate. One respondent suggested the inclusion of a timing consideration (e.g. 3 months) before the conversion or write-down is triggered, to allow sufficient time for insurers to implement a reasonable course of action. One respondent mentioned it was unclear why the 70% threshold was considered to be a significant breach of CET1 since the corresponding floor for CET1 capital is set at 65%.

6.26 The floor on CET1 capital is intended to ensure a minimum concentration of high quality capital. Including a timing consideration as suggested by the respondent may result in a further deterioration in the quality of capital during times of stress. We would expect insurers to monitor their financial resources at all times and take the necessary steps if they observe a deterioration in the level of CET1 capital towards the specified floor. With regard to the feedback on the threshold, the conversion trigger proposed for insurers is consistent with the trigger for MAS requirement for banks⁸⁵. However, we agree we should not term this as a significant breach when CET1 capital falls below this conversion trigger. It is meant to be a level at which the PLA feature will kick in if triggered.

6.27 As we have proposed earlier to reduce the floor of CET1 capital to 60% of TRR (excluding Participating Fund), MAS will **correspondingly reduce the threshold for the PLA from 70% to 65%**. The revised PLA feature can be found in paragraph 3 (m) of Annex J.

Point of Non-Viability ("PONV") feature

6.28 AT1 and Tier 2 capital instruments under the capital framework for banks are required to contain provisions⁸⁶ to ensure that they are capable of absorbing losses at PONV. There is no equivalent feature under the current insurance capital framework,

⁸⁵ Where the minimum CET1 CAR is 6.5% (before Capital Conservation Buffer) and the PLA feature requires the conversion to ordinary shares or write-down of the AT1 instrument if the CET1 CAR of the bank falls to 7% or below.

⁸⁶ That meet the requirements as set out in Annex 6B of MAS Notice 637.

and this feature has not been consulted upon in June 2012. PONV is a relatively new concept within the insurance sector amongst jurisdictions⁸⁷ globally. However, having such a feature will help to ensure that losses are imposed on holders of such capital instruments at PONV.

6.29 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.

6.30 In the second consultation, MAS consulted on whether it would be useful to require AT1 and Tier 2 capital instruments for insurers to contain the PONV feature to ensure their loss absorbency at PONV. Only two respondents agreed that it was useful to have the PONV feature, though one of them also mentioned that it was unclear if the PONV feature would be well accepted by investors and the implications on the funding cost would be well understood by the insurers. Another respondent believed that the PONV feature was not justified as it went beyond the requirements for most insurers in other jurisdictions.

6.31 Given that the PONV is still a new feature⁸⁸ within the insurance sector which is not commonly found in other jurisdictions and hence not generally understood in the market by the investors yet, **MAS will not be introducing the PONV feature at this stage.** MAS will continue to **monitor the developments in other jurisdictions and even the development of the IAIS global insurance capital standards.**

Treatment of negative reserves

6.32 In the earlier consultations, MAS proposed to recognise part of the negative reserves⁸⁹ as a form of positive regulatory adjustment under financial resources. This

⁸⁷ Only Australia has introduced the PONV feature.

⁸⁸ Feedback from investment bankers indicated that the cost of including the PONV feature is not expected to be material, but this would also be dependent on the reputation and credit rating of the issuing insurer.

⁸⁹ 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 premiums and charges) exceed the expected present value of the future outgo (such as benefit payments and expense payments), resulting in a negative reserve.

has the effect of improving an insurer's capital adequacy and fund solvency positions. This will more accurately reflect the policy intent that even though insurers are not allowed to recognise negative reserves on balance sheet, MAS is prepared to allow insurers to take some credit for such negative reserves for solvency purposes.

6.33 In the second consultation, MAS proposed that the amount of negative reserves to be recognised for solvency purposes would be determined by applying a further haircut of 50%⁹⁰ to the total amount of negative reserves computed after applying all the applicable C1 insurance shocks under RBC 2.

6.34 There was general support for not recognising the full amount of negative reserves for purposes of solvency as the future positive cash flows (e.g. premiums) which give rise to the negative reserves might not materialise. Many respondents hence supported applying the C1 insurance shocks. However, they did not think that it was necessary to apply arbitrary haircuts after the C1 insurance shocks given that the insurance shocks are already calibrated at VaR (99.5%) over a one year period.

6.35 As explained in the second consultation, the additional haircuts had been imposed as the amount of negative reserves is currently quite sizeable for some life insurers and some prudence is necessary in deciding on the amount to be recognised. MAS indicated its willingness to review the haircuts after looking into the reserving practices and understanding the drivers of the large negative reserves. Sufficient safeguards should be in place to avoid any unintended consequences such as overly optimistic reserving assumptions or excessive pricing margins to inflate the value of negative reserves. Such safeguards could be enhancements to the existing regulatory requirements and professional guidance notes around valuation.

6.36 MAS noted from its review that the large negative reserves arise from mainly two sources:

- a) **Long-term health policies** which are guaranteed renewable for the lifetime of the life insured, but the premium rates are non-guaranteed –

MAS currently does not allow the liability of any policy to be less than zero, unless one expects a recovery of monies (for example, surrender penalty in the case of investment-linked policies or recapture fees for reinsurers).

⁹⁰ The haircut is larger at 75% for investment-linked fund in view that the lapse experience tends to be more volatile due to investment element of such products.

differences in methodology⁹¹ were adopted. For such policies, there were differences in views on when an insurer should deem that an existing contract has ended and a new contract has begun (given that the premium rates can be adjusted) (i.e. contract boundaries);

- b) **Investment-linked policies** – there was inconsistency between the fund growth rate and the discount rate. Most insurers were projecting the growth of the unit fund at the best estimate fund growth rate, but discounting the cash flows in the non-unit reserves at a risk-free discount rate.

Valuation of long-term health policies

6.37 The appropriate valuation approach for long-term health policies hinges on how the contract boundaries should be determined for these policies. Internationally⁹²,

⁹¹ Some life insurers adopted the valuation methodology for life business, i.e. based on a discounted cash flow method (also referred to as gross valuation method); some adopted the valuation methodology for general business, i.e. based on unexpired premium reserve ("UPR") and unexpired risk reserve ("URR"); whilst others use a combination of both approaches.

⁹² The IAIS' consultation paper on global insurance capital standard, issued in 2014, states that "Any obligations, including future premiums, relating to the contract shall belong to the contract. However, future premiums (and associated claims and expenses) relating to an existing and recognised contract beyond the following dates should not be considered in insurance liabilities, unless the Internationally Active Insurance Group ("IAIG") can **demonstrate that they are able and willing to compel the policyholder to pay the premiums:**

a) The future date where the IAIG has a unilateral right to terminate the contract or reject the premiums payable under the contract;

b) The future date where the insurance or reinsurance undertaking has a unilateral right to amend the premiums or the benefits payable under the contract in such a way that the premiums fully reflect the risks"

IFRS Phase 2 Exposure Draft states that "Cash flows are within the boundary of an insurance contract when the entity can **compel the policyholder to pay the premiums or has a substantive obligation to provide the policyholder with coverage or other services**. A substantive obligation to provide coverage or other services ends when:

(a) The entity has the right or the practical ability to reassess the risks of the particular policyholder and, as a result, can set a price or level of benefits that fully reflects those risks; or

(b) Both of the following criteria are satisfied:

(i) The entity has the right or the practical ability to reassess the risk of the portfolio of insurance contracts that contains the contract and, as a result, can set a price or level of benefits that fully reflects the risk of that portfolio; and

there are similarities observed in the definitions of contract boundary, which centred around the right of the insurer to reassess the risk of the contract and whether the policyholder is compelled to pay any revised premium.

6.38 For a long-term health policy which is guaranteed renewable for the lifetime of the life insured, it is arguable whether the term of the policy (a) expires when the terms and conditions are changed or at the next premium revision, or (b) continues throughout the entire lifetime of the insured, given that there is the guaranteed insurability coverage and it is evident to policyholders that the coverage is for life.

6.39 MAS has recently engaged the SAS on an appropriate methodology for valuing long-term health policies, which includes the need to establish an appropriate definition of contract boundary in the professional guidance note on valuation. Once that boundary has been determined, the expected value of all the cash flows falling within the existing contract should be included in the measurement of the policy liabilities.

6.40 **SAS has proposed that the policy liabilities of long-term health policies should be made up of the following components, though there was no consensus yet on the determination of the contract boundary:**

- a) An amount which is adequate to cover the cost of future expected claims and expense outgo, allowing for future expected premiums and investment income. The term of projection would depend on the contract boundary definition adopted;
- b) An amount i.e. claims liabilities, which is adequate to cover the cost of claims which has already been incurred prior to the valuation date. Claims liabilities comprise reported but not settled claims and incurred but not reported claims; and
- c) An active claims reserve for covering cost of future long-term recurrent claims arising from claims incurred prior to valuation date if these liabilities have not already accounted for in (a).

(ii) The pricing of the premiums for coverage up to the date when the risks are reassessed does not take into account the risks that relate to future periods."

Question 52. MAS seeks comments on the proposal to value long-term health policies as described in paragraph 6.40 above.

Question 53. MAS seeks views on what the contract boundary should be in the case of long-term health policies. Please explain your response.

Valuation of investment-linked policies (non-unit reserves)

6.41 As mentioned earlier, most insurers were projecting benefits using a best estimate fund growth rate, whilst discounting at the risk-free discount rates based on the SGS yields. This inconsistency has resulted in some very large negative reserves. Hence, there is a need to align the projection rate used and the rate used to discount future cash flows to ensure consistency.

6.42 The life insurance industry has proposed two approaches that could help to achieve consistency:

- a) **Approach 1:** Project and discount both unit and non-unit reserves at insurer's best estimate fund growth rate. This is similar to the current valuation requirements for the total liabilities (i.e. guaranteed and non-guaranteed liabilities) of participating and universal life businesses. The resultant cash flow projection will better match the insurer's realistic expectations under this approach; or
- b) **Approach 2:** Project and discount both unit and non-unit reserves at "risk-free rate"⁹³. This is consistent with how C2 interest mismatch risk requirement is derived, and consistent with how some insurance groups treat such business (i.e. Solvency II). Further, there could be issues with the first approach in that there needs to be more consistency across the industry on how best estimate fund growth rate is set.

6.43 Given the divergent views, MAS proposes to **investigate the impact of both approaches under QIS 2.**

⁹³ LIA interprets "risk-free" as free from mismatch in economic characteristics between asset and liabilities, including liquidity characteristics. "Risk-free rate" will therefore include, where applicable, any uplift in discount rate over sovereign yield to reflect the liquidity characteristics of the liability being valued.

Question 54. MAS seeks views on the proposed approaches to value investment-linked policies (non-unit reserves) as described in paragraph 6.42. Which approach is more appropriate, or should the higher of both approaches be used for prudence? Please give reasons to support your preference.

Removal of the arbitrary haircut

6.44 Given that we now have a better understanding of the drivers of the high negative reserve values, and are working with the industry to ensure more consistency in the valuation practices with regard to long-term health plans and investment-linked policies, MAS proposes to **remove the haircuts**. In other words, **insurers will be able to recognise the full negative reserves as a form of positive regulatory adjustment after applying all the applicable C1 insurance shocks**. MAS will continue to work with the industry, namely LIA and SAS, on the appropriate valuation methodology for the two types of products, with a view to enhancing the existing regulatory requirements and professional guidance notes around valuation. However, MAS may re-introduce the haircuts if there is no consensus to arrive at a consistent valuation methodology for the valuation of the two types of products.

Treatment of allowances for provision for non-guaranteed benefits ("APNGB")

6.45 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 capital ratio⁹⁴ ("adjusted capital ratio condition"). The value of APNGB that can be recognised as part of financial resources is subject to the limits⁹⁵ of the lower of

- a) 50% of the aggregate Present Value of Non-Guaranteed Benefits and PAD;
or

⁹⁴ 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 capital ratio* (i.e. excluding the financial resources and TRR of the participating fund from the numerator and denominator of the capital ratio respectively), as defined in paragraph 1(9) of the First Schedule of the Insurance (Valuation and Capital) Regulations 2004.

⁹⁵ As set out in paragraph 1(8) of the First Schedule of the Insurance (Valuation and Capital) Regulations 2004.

b) Policy Assets less Minimum Condition Liability ("PA – MCL")

6.46 The first limit implies that an insurer should not be cutting non-guaranteed bonuses by more than 50%, as doing so may have implications on policyholders' reasonable expectations.

6.47 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. 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.

6.48 In the second consultation, MAS suggested retaining the 50% factor in the first limit, given that there was no strong basis at that juncture for refining the current factor, and the limit, along with the other safeguards (i.e. the (PA – MCL) limit and the adjusted capital ratio condition), would help to ensure the overall prudence in how participating fund is managed.

6.49 One respondent commented that with the higher stresses (which would be calibrated at a one-in-200 year confidence level under RBC 2), more than 50% adjustment to the non-guaranteed bonuses may be required. Another respondent made a similar comment that full credit to the value of non-guaranteed benefits should be given as by virtue of the non-guaranteed nature, the value of non-guaranteed benefits has non mandatory servicing requirements or encumbrances. The respondent also added that the permanence of value of non-guaranteed benefits as capital element is ensured as this value is not earmarked to any particular policy and may therefore remain as the working capital of the participating fund on an on-going basis.

6.50 In view that the risk requirements are going to be calibrated at VaR (99.5%) over a one year period under RBC 2, MAS acknowledges that it may be onerous to retain the 50% limit as insurers have the discretion to cut bonuses in full (especially when it is such a severe one-in-200 year scenario). Given that there will still be the rest of the safeguards in place, i.e. the (PA – MCL) limit and the adjusted capital ratio condition, MAS proposes to **remove the 50% limit under RBC 2**.

Question 55. MAS seeks comments on the proposal to remove the 50% limit as described in paragraph 6.50.

Reinsurance adjustment

Removal of reference to the licensing status of reinsurance counterparty

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

$A \times B \times C$, where

A= Reinsurance reduction, which is broadly the reduction in the value of liabilities due to reinsurance ceded to the reinsurance counterparty. This amount can be reduced currently by reinsurance deposits and collateral arrangements. MAS is also **prepared to recognise the use of Letter of Credit for this purpose;**

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

6.52 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). There were no strong objections to this proposal, and hence MAS will **proceed to remove Factor B under RBC 2.**

Recognition of reinsurance arrangements with Head Office

6.53 Under the current RBC framework, a branch in Singapore is allowed to recognise arrangements with its Head Office as reinsurance provided that a written agreement exists between the Singapore branch and its Head Office. Credit for the amount of reinsurance ceded is then given in the form of a capital relief through mainly a reduction in policy liabilities for the Singapore branch. Besides reducing policy liabilities, credit risk arising from these reinsurance arrangements is also accounted for appropriately through adjusting the financial resources (i.e. reinsurance adjustment) as well as the total risk requirement (where reinsurance recoverables are risk-charged).

6.54 In past consultations, MAS proposed to **remove the recognition of an arrangement between a Head Office and its branch in Singapore as reinsurance arrangement, regardless of whether there is a written agreement between them**. This is in view that Head Office and its Singapore branch are considered as the same legal entity and there is no effective transfer of risk under such a transaction.

6.55 One key consultation feedback was that the current recognition allows the Singapore branch direct access to the strong capital base of the Head Office; the removal of the concession would curtail the Singapore branch's capacity to write more business. In addition, such arrangements with Head Office keep the branches' profits and solvency position stable.

6.56 To clarify, the proposed de-recognition does not prohibit branches from continuing with such arrangements but rather, such transactions would no longer be considered as reinsurance arrangements. The proposal seeks to reflect the true economic substance of such an arrangement between a Head Office and the Singapore branch. This is also consistent with the practices in other jurisdictions. There are only a few insurers affected by this de-recognition, and MAS will **continue to work with them to explore measures that could mitigate the capital impact. Such measures being looked at include trust or segregated accounts**.

Question 56. MAS seeks comments on the proposal to de-recognise arrangement between the Head Office and its branch in Singapore as a reinsurance arrangement, regardless of whether there is a written agreement between them. MAS will continue to work with the few affected insurers to finalise the acceptable measures (e.g. trust or segregated accounts, Letter of Credit) that could mitigate the impact, to provide more certainty to players before implementing the de-recognition.

Recognition of reinsurance arrangements arranged by Head Office

6.57 A more common approach is to include the risks written by the branch in Singapore in the Head Office's reinsurance arrangements with third party reinsurers. This is economical for the insurers as most of the branch operations in Singapore are small compared to their Head Offices. MAS is prepared to recognise such reinsurance arrangements, regardless of whether the branch has a legal right to receive the recoveries directly from the third party reinsurers. However, safeguards or conditions should be implemented to mitigate the risks of recoveries due to the branch being withheld by the Head Office. Any uncertainty or ambiguity about whether the branch is indeed included in the third party reinsurance arrangements, which can happen when the branch does not have legal right to receive the recoveries directly from the third

party reinsurers or is not a named party to the arrangement, should be minimised. In the second consultation, MAS sought suggestions on the safeguards or conditions that can be put in place.

6.58 Some respondents suggested the use of letter of credit/comfort or segregated accounts at Head Office. There were also suggestions for enhanced governance requirements such as ensuring timely settlement of balances due to the Singapore branch by setting up cash deposits for quarterly/semi-annual settlement of open reinsurance claims and for Head Office to provide regular letter of attestation for the branch to confirm receivables and settlement amounts. There were further suggestions for MAS to limit branches' exposure to Head Office depending on the Head Office's financial strength.

6.59 Upon further deliberation, the additional credit risk is most pronounced when the third party reinsurers have paid their share of the reinsurance recoverables and the assets sit at the Head Office, waiting to be distributed. It was noted that some jurisdictions have rules around reinsurance arrangements including the prompt payment of amounts owing to the group entities. These requirements would help to ensure timely settlement for branches.

6.60 MAS thus proposes that **where reinsurance recoverables have already been paid from third party reinsurers, pending distribution from the Head Office, the amount would be subject to a risk charge that is dependent on the credit rating of the Head Office for the initial ageing period of 90 days. Once past the ageing period, a 100% risk charge would be levied.** This is consistent with existing capital treatment for intra-group transactions. Insurers should have the necessary governance mechanisms in place to ensure that they are notified when third party reinsurers have paid reinsurance recoverables to their Head Offices.

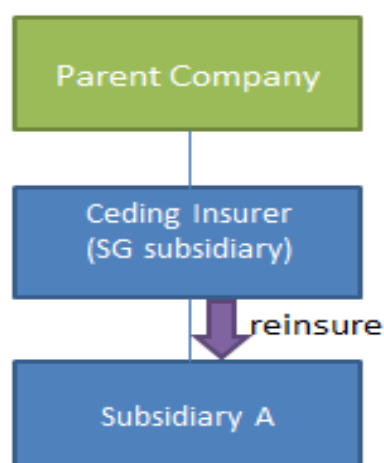
6.61 For cases where the Singapore branch does not have the legal right to receive the recoveries directly from the third party reinsurers or is not a named party to the contract, whilst the reinsurance arrangement would be given credit, MAS proposes for **the Head Office to provide a written confirmation (e.g. letter of comfort) that the Singapore branch is indeed covered within its reinsurance arrangements with third party reinsurers. The letter should also contain other relevant details pertaining to the arrangements such as how reinsurance recoverable to the branch will be determined.**

Question 57. MAS seeks comments on the proposal to continue to recognise reinsurance arrangements where risks written by the Singapore branch are included in the Head Office's reinsurance arrangements with third party reinsurers, regardless of whether the branch has a legal right to receive the recoveries directly from the third party reinsurers, subject to the safeguards described in paragraphs 6.60 and 6.61 above.

Recognition of reinsurance arrangements with downstream entities

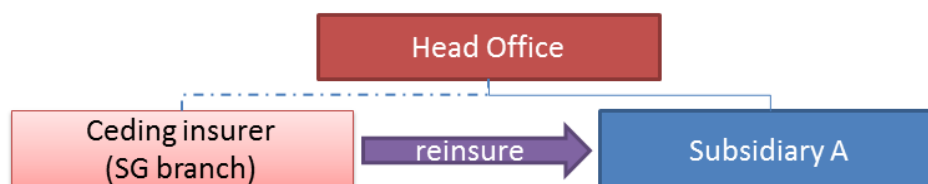
6.62 Though uncommon, insurers may also purchase reinsurance protection from its subsidiary (example shown in [Diagram 24](#)), or for branches, a subsidiary of its Head Office (example shown in the [Diagram 25](#)). MAS previously proposed to remove the recognition of reinsurance arrangements with downstream entities⁹⁶. Though such arrangements are currently recognised, MAS was of the view that such reinsurance arrangements would not constitute effective risk transfer as the risk continues to be retained in the consolidated accounts of the insurer. In the event that the subsidiary runs into financial difficulties, the insurer in Singapore, being the immediate parent (or even the Singapore branch for that matter being the same legal entity as the Head Office), would be expected to inject capital in the subsidiary, negating the effect of risk transfer to the subsidiary via the reinsurance arrangement.

Diagram 24: Singapore subsidiary reinsuring with its own subsidiary



⁹⁶ 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 its Head Office.

Diagram 25: Singapore branch reinsuring to a subsidiary of its Head Office



6.63 A number of respondents have commented that reinsurance with downstream entities should be given due credit, since the downstream entities are separate legal entities and hence, there is effective risk transfer. The reinsurance to downstream entities also forms part of group-wide risk management where risks and capital are centrally managed. Many also sought clarifications on whether, for an insurer incorporated in Singapore, downstream entities include subsidiaries of its parent company. To clarify, such cases (see Diagram 26) would not be caught as downstream entities. In fact, Diagram 27 would also not be caught.

Diagram 26: Singapore subsidiary reinsuring to another subsidiary of the parent company or within the group

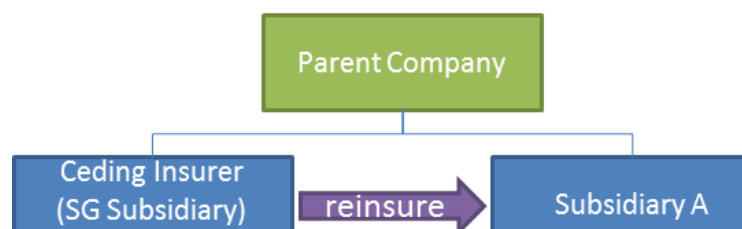
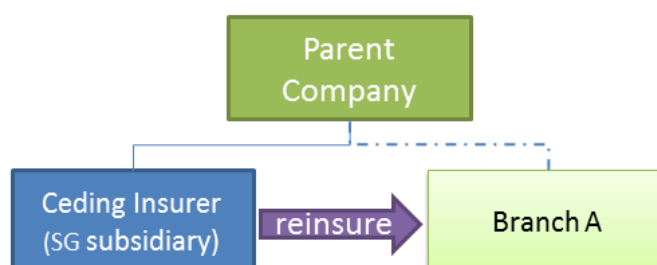


Diagram 27: Singapore subsidiary reinsuring to branch of the parent company or within the group



6.64 MAS is prepared to **recognise the arrangements with downstream entities as reinsurance, but requires safeguards such as collaterals and letter of credit for the benefit of the ceding insurer before recognition can be given.** This will help ensure that the amounts reinsured are safeguarded for Singapore entity. In the case of the

arrangement described in Diagram 24, if the ceding insurer is designated as an insurance group by MAS and thereby requiring accounts and capital requirements to be prepared on a consolidated basis, no credit will be given at the group level.

Question 58. MAS seeks comments on the proposal to continue to recognise reinsurance arrangements with downstream entities, subject to safeguards such as collaterals and letter of credit for the benefit of the ceding insurer being in place before recognition can be given.

6.65 For the avoidance of doubt, MAS will not recognise a reinsurance arrangement where the Singapore subsidiary cedes to its own branch, as there is no effective transfer of risk (the Singapore subsidiary and its branch belong to the same legal entity).

7 Treatment of OIF for Reinsurers

7.1 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.

7.2 As for the OIF⁹⁷, licensed reinsurers are currently subject to either a simplified solvency regime⁹⁸ (in the case of locally incorporated reinsurers) or exempted from capital or solvency requirements altogether (in the case of reinsurance branches).

7.3 In the second consultation, MAS proposed the following capital treatment for the OIF for reinsurers:

- a) To continue to exempt the OIF of **foreign-incorporated licensed reinsurers** (i.e. reinsurance branches) from the solvency requirements. For avoidance of doubt, the reinsurers will still need to hold sufficient assets to meet the liabilities in the OIF;
- b) To continue to subject the OIF business of **foreign-owned locally incorporated reinsurers** to the current simplified solvency requirement (i.e. remain status quo);

⁹⁷ The same approach has also been adopted for the reinsurance branches located outside of Singapore for a locally incorporated reinsurer. This means that a locally incorporated reinsurer must maintain a solvency margin in relation to the aggregate of its overseas branches' business, as described in the following footnote.

⁹⁸ For locally incorporated general reinsurers, the solvency margin for the OIF shall not be less than the greater of:

- (a) S\$5 million;
- (b) 10% of net premium income of the fund in the preceding accounting year; or
- (c) 10% of claim liabilities 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:

- (a) S\$5 million; or
- (b) 10% of reserves calculated according to the Insurance (Valuation and Capital) Regulations 2004

- c) To subject the OIF of **locally-owned locally incorporated reinsurers** to full RBC 2 requirements. Appropriate transitional arrangements will be provided for affected reinsurers.

7.4 MAS would like to clarify that the distinction should be between whether Singapore is the home or host regulator of the locally incorporated reinsurer, and not whether the locally incorporated reinsurer is locally or foreign-owned. Therefore, we will **make it clear in our rules that for locally incorporated reinsurers, as long as the locally incorporated reinsurer is headquartered in Singapore (i.e. ultimate parent is incorporated in Singapore), the OIF will be subject to RBC 2** since MAS has the oversight responsibility as the home regulator. This will reflect our policy intent more accurately than the type of ownership.

7.5 In addition, as explained in the second consultation paper, locally incorporated reinsurers which are headquartered in Singapore 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 convergence⁹⁹ of group-wide supervisory practices, any disparity in standards will reduce over time.

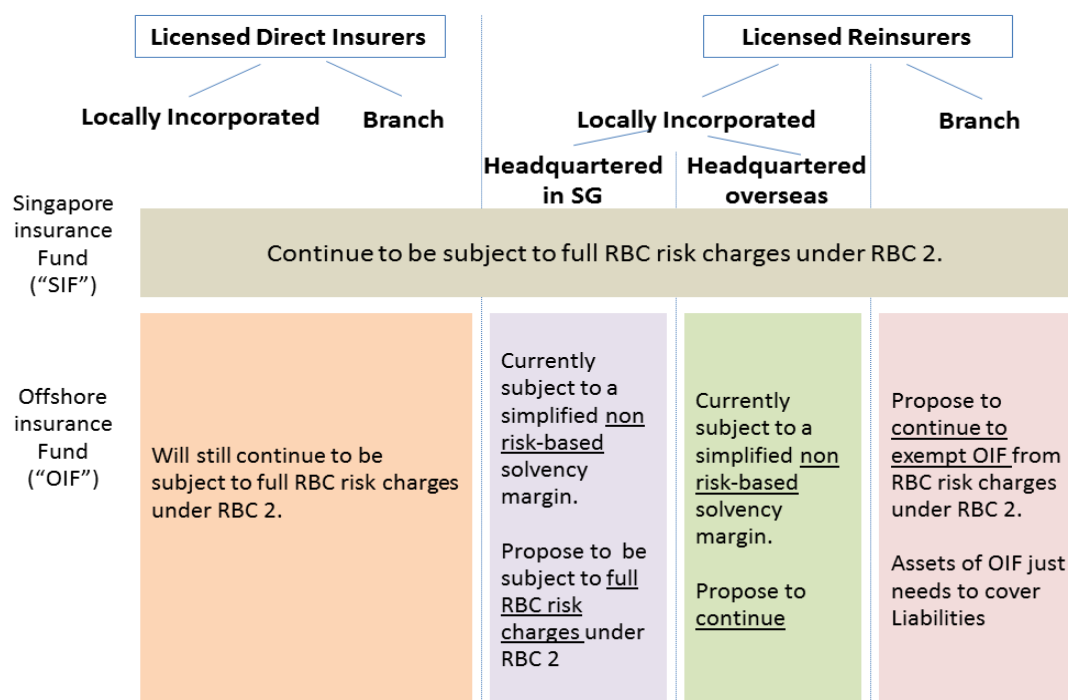
7.6 Lastly, MAS will rely on the ORSA and also industry-wide stress test exercise¹⁰⁰, to ensure that the risks of the OIF business of reinsurers are well managed. MAS will also monitor closely developments at the head offices/ parent companies to assess the risks to the viability of the reinsurers here and require prompt remedial actions where necessary. MAS reserves the power to impose other compensating prudential requirements on the OIF of reinsurers (even in the case of reinsurance branches) that MAS has concerns with.

7.7 Diagram 25 summarises the proposed capital treatment for reinsurers.

⁹⁹ IAIS' ComFRAME initiative will continue to foster greater harmonisation in the way internationally active insurance groups, such as the major reinsurers which Singapore hosts, are being supervised.

¹⁰⁰ This will be introduced to the more significant reinsurers once RBC 2 is implemented.

Diagram 25: Summary of proposed capital treatment for direct insurers and reinsurers



8 Quantitative Impact Study

8.1 The detailed technical specifications for QIS 2 can be found in **Annex K**. The QIS has been designed to gather information to help evaluate the impact of the revised RBC 2 proposals.

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

8.3 The projections under QIS 2 will be based on the valuation date of 31 December 2015. To assess the impact of the proposals presented, insurers are required to provide the results for the following bases¹⁰¹ in the Excel workbook provided within **Annex K**:

- (a) **Basis 1:** Insurers will be required to incorporate all RBC 2 proposals with the exception of the MA and IP;
- (b) **Basis 2:** Insurers will be required to incorporate all RBC 2 proposals including MA and IP.

8.4 As mentioned in paragraphs 4.27 and 4.33, the technical specifications for MA and IP (which will help inform **Basis 2**) are targeted to be issued within one month after the issuance of this third consultation paper. These will also include some sensitivity tests on market movements.

8.5 The completed Excel workbook(s) are to be submitted¹⁰² to MAS by **20 October 2016**. Insurers can direct all queries relating to QIS 2 to QIS_2@mas.gov.sg

Question 59. MAS seeks comments on any implementation issues encountered in conducting QIS 2.

¹⁰¹ A direct general insurer or general reinsurer would only need to do Basis 1. Direct life insurers and life reinsurers would need to do both bases, including the additional sensitivity analysis to be prescribed in the technical specifications on MA and IP.

¹⁰² With the necessary encryption as specified in **Annex K**.

9 Next Steps

9.1 MAS will continue to engage the industry closely, especially in the areas identified in the earlier sections.

9.2 While the design of RBC 2 is taking shape, there are still some outstanding pieces which may require further QIS, for example, the proposals on matching adjustment and illiquidity premium for life insurers.

9.3 MAS will work with the industry on the implementation date later after the design is more firmed up. MAS noted from previous consultations that the industry has indicated that it would need at least two years after the finalisation of the framework to implement RBC 2. The industry will be given sufficient time to prepare for the implementation of RBC 2.

9.4 MAS will be consulting on some interim enhancements¹⁰³ to the current Insurance (Valuation and Capital) Regulations 2004, given that the RBC 2 implementation will not take place so soon. The consultation is targeted to be issued by Q3 2016.

9.5 MAS will also be consulting on the relevant legislative changes to support RBC 2 once the design is more finalised.

¹⁰³ For example, the removal of the prescribed mortality and annuitants' mortality tables for computation of C1 requirement, treatment of charged assets, and ageing of outstanding premiums for multi-year insurance contracts.

Annex A

LIST OF QUESTIONS

Question 1. MAS seeks comments on maintaining PCR and MCR at the following adjusted fund level (i.e. SIF – Par, SIF – Others, OIF – Par, OIF – Others). Do you foresee any prudential concerns in doing so?17

Question 2. MAS seeks comments on the proposed discounting approach as described in paragraph 4.12.24

a) Is the proposed approach where risk-free discount rates are based on (i) observable market yields up to the LLP; (ii) UFR after a specified period after the LLP, and (iii) extrapolated yields in between, appropriate? Please explain your responses and suggest alternative approaches if your answer is 'No'.

b) Are the proposed LLPs reasonable? If not, what would be appropriate LLPs to be used?

c) What method should be used for extrapolating the forward rates from LLP to the point where UFR commences?

d) What would be an appropriate level of UFR? How should it be determined?

e) What should be the point at which the UFR commences? How should this be determined?

Question 3. MAS seeks views on whether the MA and illiquidity premium adjustments will be relevant and helpful for general business, especially in cases where the liabilities are long-term.25

Question 4. MAS seeks comments on the proposed revisions in eligibility criteria for MA as specified in **Annex C**.30

a) Would the proposed revisions help insurers to implement the MA? Where applicable, please give alternative suggestions to improve the usefulness and relevance of MA.

b) Should the predictability test be based on the present value of cash outflows (i.e. benefits and expenses only) instead of the best estimate liabilities which are based on the present value of cash out flows net of cash inflows (e.g. premium income)? Please provide reasons for your response.

c) Given that there are some products which would not benefit from the application of MA, is it necessary or practical to limit the scope of the MA to just Whole Life and Endowment (based on the classification in the statutory Form 14)? Please provide reasons for your response.

d) Is the MA relevant for life reinsurance business? Please provide details to justify your response.

Question 5. MAS seeks comments on the proposed methodology for determining the cost of default (**Annex D**).31

Question 6. MAS seeks comments on any overall views or suggestions to refine the proposed MA framework.....31

Question 7. MAS seeks comments on the proposed framework for IP, as set out in **Annex E**.33

a) What would be an appropriate IP as specified by the parameter $k\%$ of the Reference Spread? Please provide details to justify your response.

b) Should an absolute cap (i.e. the $Y\%$) be introduced to remove the effects of extreme market movements? If 'Yes', how should the cap be set? If 'No', how should the effects of extreme market movements (which can lead to abnormally high levels of IP) be managed?

c) The IP specifications currently state that the IP is added to the entire valuation curve. This implies that the IP can be earned throughout the duration of the liabilities. Is this treatment appropriate? Please explain your response, and if the response is 'No', please give suggestions on the appropriate length of time the IP should be applied.

d) Similar to MA, there may be products which would not benefit from the application of IP. Is it necessary or practical to limit the scope of IP for example to just Whole Life and Endowment (based on the classification in the statutory Form 14)? Please provide reasons for your response.

Question 8. MAS seeks comments on any overall views or suggestions to improve the IP framework.....33

Question 9. MAS seeks views on the proposed safeguard to require financial resources after the application of MA and IP to meet at least 100% of MCR.

The application of the MA and IP will reduce liabilities due to the use of higher discount rates. To avoid insurers relying solely on the MA and IP to meet the MCR, do you agree with the above proposed safeguard? If your answer is 'No', please justify your response, as well as provide any suggestions on safeguards.33

Question 10. MAS seeks comments on the proposed treatment of UL policies under RBC2.36

Question 11. MAS seeks comments on whether the 30% factor used to compute the mass lapse risk requirement for UL policies is appropriate.

Where the 30% factor is not considered as appropriate, please explain your responses and provide suggestions (i.e. methodology and reference data) for an appropriate approach to calibrate the factor.....36

Question 12.MAS seeks views on how UL policies should be treated in the computation of the surrender value condition requirement at the fund level, given that the excess of surrender values over policy liabilities has already to some extent, been taken into account in the mass lapse risk requirement for UL policies, which will form part of the total risk requirements.36

Question 13.MAS seeks comments on the proposed approach in calibrating insured events (A&H) as described in paragraph 5.36.48

Question 14.MAS seeks comments on the following approach, where MAS will continue to engage LIA and SAS in exploring whether it is feasible to collect more granular data from insurers and calibrate the insured events (A&H) risk requirement.48

Question 15.MAS seeks comments on the proposed approach in calibrating the life insurance catastrophe risk requirement, as described in paragraph 5.40.49

Question 16.MAS seeks comments on whether there is a need to have a separate shock on the expense inflation rate. If a separate shock is needed, what method as well as reference data can we use to calibrate this shock, as well as the correlation between the unit expense and inflation components?50

Question 17.MAS seeks comments on the relevance, design and calibration of the mass lapse event within the computation of the lapse risk requirement.....51

a) Whether there is a need to include a mass lapse event as one of the conditions when calculating the lapse risk requirement (i.e. lapse risk requirement will be based on (i) a permanent increase of 50% to the best estimate lapse rate assumptions, (ii) permanent decrease of 50% to the best estimate lapse rate assumptions, or (iii) the mass lapse event, whichever produces a higher liability value);

b) Whether the mass lapse event should be dependent on the type of product e.g. predominantly savings or protection products, positive or negative surrender strain etc.; and

c) What method and reference data should be used to calibrate the mass lapse event.

Question 18.MAS seeks comments on the proposed approach in calibrating lapse risk requirement as described in paragraph 5.50.52

Question 19.MAS seeks comments on adopting the correlation matrix (Diagram 15) when aggregating the C1 requirements for life business.53

Question 20.MAS seeks comments on whether there is a need to consider other types of risks (e.g. lapse) for C1 requirements for general business, in addition to premium

liability, claim liability and insurance catastrophe risk requirements. If so, what are these risks, and how are they relevant for general business? What method and reference data should be used to calibrate these risks?.....54

Question 21.MAS seeks comments on the proposal to allow for diversification benefits explicitly through the prescribed correlation matrix (Diagram 16) to aggregate the C2 risk requirements.56

Question 22.MAS seeks comments on how we should combine the aggregated C2 risk requirements (i.e. those covered by the explicit correlation matrix) with the C2 counterparty default risk requirement. We recognise that there should be some correlation between the market risks and the counterparty default risk. Is 0.5 a reasonable and practical factor to use given data constraints? Please provide alternative suggestions if you disagree with the approach.57

Question 23.MAS seeks comments on the approach of having two distinct risk categories for equities and applying the proposed factors, to the market value of each equity exposure.58

Question 24.MAS seeks comments on the usefulness of the data grouping approach and alternative suggestions on overcoming the potential operational challenges of a look-through approach.60

Question 25.MAS seeks comments on the proposal to apply the same set of interest rate adjustments as shown in Diagram 17 on insurers' debt securities and policy liabilities. .64

Question 26.MAS seeks comments on how interest rate shocks should be applied to the extrapolated segment of the discount curve (as discussed in Section 4), which will converge to the UFR. In determining the interest rate mismatch requirement under QIS 2, an adjustment of 25% is applied to durations of 20 years or more, which would include the extrapolated segment. Is this treatment appropriate? If not, how should interest rate shocks be applied?.....65

Question 27.MAS seeks comments on the proposed approach as described in paragraph 5.84 for debt securities with embedded interest rate options.65

Question 28.MAS seeks comments on giving insurers the flexibility to apply the modified duration approach in calculating their interest rate mismatch and credit spread risk requirements, as described in paragraph 5.86.65

Question 29.MAS seeks comments on the proposal to apply the credit spread shock (expressed in basis points) in Diagram 19 to the debt portfolio.67

Question 30.MAS seeks comments on the proposed treatment of unrated bonds as described in paragraphs 5.99 and 5.100.69

Question 31. MAS seeks comments on the proposed criteria for the recognition of internal credit rating model for unrated bonds as set out in Annex H . The key criteria that MAS will focus on will be around oversight and control on the internal rating model, drawing useful and relevant references from MAS 637 for the banking sector, and also from some of the best practices observed in insurers.	70
Question 32. MAS seeks comments on the proposed approach for sovereign bonds.	71
Question 33. MAS seeks comments on the proposed approach for bonds issued by public sector entities.	72
Question 34. MAS seeks comments on the proposed approach for bonds with guarantees or collaterals.	72
Question 35. MAS seeks comments on whether the proposals relating to treatment of bonds issued by Singapore statutory boards and multilateral agencies, sovereign bonds, bonds issued by public sector entities and bonds with guarantees or collaterals are consistent.	72
Question 36. MAS seeks comments on the proposed approach of deriving the risk requirements for structured products.....	74
Question 37. MAS seeks comments on the proposed treatment of derivatives under QIS 2 as well as in future under RBC 2.	76
Question 38. MAS seeks comments on the proposal to apply the proposed factors to the relevant market exposure when calculating property investment risk requirement.	77
Question 39. MAS seeks views on the questions set out in Annex I to better understand the specific types and characteristics of infrastructure financing that our insurers may be keen on, the appropriate capital treatment for such investments, and the data available to back the proposed treatment.	78
Question 40. MAS seeks comments on the proposed approach with respect to foreign currency mismatch risk requirement.	81
Question 41. MAS seeks comments on the approach as described in paragraph 5.137, where the functional currency of an insurer is not in SGD.	81
Question 42. MAS seeks comments on the proposed treatment for unrated corporates when deriving counterparty default risk requirement as described in paragraphs 5.146 and 5.147.	85
Question 43. MAS seeks comments on whether the counterparty default risk charge for outstanding premiums should be linked to the credit rating of the policyholder or cedant. Is credit rating as relevant in determining the counterparty default risk requirement for outstanding premiums as it is for other modules like loan, derivative	

counterparty and reinsurance recoverables? Please explain your response and provide alternative suggestions on how the risk charge for outstanding premiums should be determined otherwise.85

Question 44.MAS seeks comments on the proposal to impose a 100% risk charge on reinsurance recoverables exposures that are outstanding for more than a year, regardless of whether it is for treaty or facultative reinsurance.86

Question 45.MAS seeks views on the ageing of outstanding premiums and agents' balances.87

a) What should be the ageing definition for reinsurance business? Should a distinction be made on whether the premiums are based on estimates or billable date?

b) In the first consultation, MAS proposed to impose a 100% risk charge for outstanding premiums that are outstanding for more than a year for facultative reinsurance, and outstanding for more than two years for treaty reinsurance. Is this ageing structure appropriate? Should it be differentiated by whether the premiums are based on estimates or billable date, rather than whether it is facultative or treaty reinsurance business? Please explain your response.

Question 46.MAS seeks comments on the proposal to allow the insurer to reduce its counterparty default exposures by the amount of acceptable collateral, subject to the haircuts described in paragraph 5.155.88

Question 47.MAS seeks comments on the proposal that deposits with a bank or deposit-taking institution that can be unconditionally withdrawn within 6 months of the date of computation of the total risk requirements be subject to the charges set out in Diagram 22.89

Question 48.MAS seeks comments on the proposal to remove the C3 risk requirements, and instead, deduct asset holdings which exceed prescribed concentration limits from the financial resources. The deductions would be made from Common Equity Tier 1 capital.91

Question 49.MAS seeks comments on the approach to explore more latitude in how the concentration limits can be applied. Under QIS 2, MAS will test the impact of applying the concentration limits at the levels consistent with paragraph 3.11.....91

Question 50.MAS seeks comments on the proposed formula for calculating the operational risk requirement, subject to a cap of 10% of the TRR (after applying the diversification benefits but excluding the operational risk requirement itself, to avoid circularity in computation).94

Question 51. MAS seeks comments on the approaches outlined in paragraph 5.172. Please provide details on how a Pillar 2 approach should entail if MAS were to consider this in the longer term.	95
Question 52. MAS seeks comments on the proposal to value long-term health policies as described in paragraph 6.40.	107
Question 53. MAS seeks views on what the contract boundary should be in the case of long-term health policies. Please explain your response.	107
Question 54. MAS seeks views on the proposed approaches to value investment-linked policies (non-unit reserves) as described in paragraph 6.42. Which approach is more appropriate, or should the higher of both approaches be used for prudence? Please give reasons to support your preference.	108
Question 55. MAS seeks comments on the proposal to remove the 50% limit as described in paragraph 6.50.	110
Question 56. MAS seeks comments on the proposal to de-recognise arrangement between the Head Office and its branch in Singapore as a reinsurance arrangement, regardless of whether there is a written agreement between them. MAS will continue to work with the few affected insurers to finalise the acceptable measures (e.g. trust or segregated accounts, Letter of Credit) that could mitigate the impact, to provide more certainty to players before implementing the de-recognition.	111
Question 57. MAS seeks comments on the proposal to continue to recognise reinsurance arrangements where risks written by the Singapore branch are included in the Head Office's reinsurance arrangements with third party reinsurers, regardless of whether the branch has a legal right to receive the recoveries directly from the third party reinsurers, subject to the safeguards described in paragraphs 6.60 and 6.61.	113
Question 58. MAS seeks comments on the proposal to continue to recognise reinsurance arrangements with downstream entities, subject to safeguards such as collaterals and letter of credit for the benefit of the ceding insurer being in place before recognition can be given.	115
Question 59. MAS seeks comments on any implementation issues encountered in conducting QIS 2.	119

Annex B

LIST OF RESPONDENTS FOR SECOND CONSULTATION

1. ACE Insurance Limited
2. AIA Singapore Pte Ltd
3. AIG Asia Pacific Insurance Pte Ltd
4. Allianz Global Corporate & Specialty SE Singapore Branch
5. Allied World Assurance Company Ltd
6. Asia Capital Reinsurance Group Pte. Ltd.
7. Aviva Ltd
8. AXA Insurance Singapore Pte Ltd
9. AXA Life Insurance Singapore Private Limited
10. AXA Corporate Solutions Assurance, Singapore Branch
11. AXIS Specialty Limited (Singapore Branch)
12. Endurance Specialty Insurance Ltd. Singapore Branch
13. General Insurance Association (“GIA”)
14. Generali International Limited Singapore Branch
15. The Great Eastern Life Assurance Company Limited
16. Institute of Singapore Chartered Accountants
17. Korean Reinsurance Company Singapore Branch
18. Life Insurance Association Singapore (“LIA”)
19. Lloyd’s of London (Asia) Pte Ltd
20. Manulife Singapore Pte Ltd
21. Mercer (Singapore) Pte Ltd

22. MSIG Insurance (Singapore) Pte Ltd
23. Munich Re, Singapore Branch
24. Pacific Life Re (Singapore branch)
25. Prudential Assurance Company Singapore (Pte) Limited
26. QBE Insurance (International) Limited, Singapore Branch
27. Renaissance Reinsurance Ltd (Singapore Branch)
28. SCOR Reinsurance Asia Pacific Pte Ltd and SCOR Global Life SE Singapore Branch
29. Singapore Reinsurance Association ("SRA")
30. Singapore Actuarial Society ("SAS")
31. Swiss National Insurance Company Limited (Singapore branch)
32. Swiss Reinsurance Company Ltd. Singapore Branch
33. Tower Watson
34. ZZ Management and Consulting

One Respondent requested confidentiality.

A number of insurers provided their responses through the industry associations.

Annex C

ELIGIBILITY CRITERIA TO BE MET FOR APPLYING MATCHING ADJUSTMENT

Conditions	Specified in the Second Consultation	Revised Conditions for Third Consultation
Eligible Assets	<p>The following assets are eligible:</p> <ul style="list-style-type: none"> • SGS or SGD corporate bonds of investment grade quality¹; • US treasury securities or USD corporate bonds of investment grade quality; and • Cash denominated in SGD or USD. 	<p>No change overall but to allow for USD Treasury Securities or USD corporate bonds to back SGD liabilities, subject to the insurer putting in place a suitable currency swap to convert the resulting USD payments to SGD cash flows.</p> <p>In the absence of a currency swap, a 12% haircut² in cash flows would be imposed in the assessment of the cash flow mismatch test below.</p>
	<p>Eligible assets should have only fixed cash-flows (in terms of timing and currency) and no issuer options (such as call or put options).</p>	<p>Propose to only recognise cash flows before 1st call in cash flow matching criteria.</p>

¹ SGD 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.

² Consistent with the foreign currency mismatch charge proposed under RBC 2.

Conditions	Specified in the Second Consultation	Revised Conditions for Third Consultation
	Bonds with credit rating from BBB- to BBB+ will be limited to 30% of the total eligible assets.	The limit of 30% is removed.
	Eligible assets are to be explicitly identified and managed separately from the other assets in the Insurance fund, to ensure that they are not exposed to the risk of forced sale to support other liabilities.	No change. Details of how this can be done can be addressed at a later stage.
Eligible products	Products denominated in SGD or USD will be eligible for the MA.	No change.
	<p>All life products that have predictable cash flows from risks arising from mortality, lapse, disability, dread disease and other insured events are eligible.</p> <ul style="list-style-type: none"> Predictability will be evaluated based on tests which measure the change in the best estimate liabilities after applying specified insurance C1 shocks on mortality, lapse, disability, dread disease, and other insured events. The resulting total increase in best estimate liabilities from the shocks must not be more than x% (TBD). For participating products, the predictability test is to be applied on the liabilities for guaranteed benefits. 	<p>Predictability test to be applied annually to ensure liabilities remain eligible.</p> <p>Predictability test may be based on cash outflows (i.e. excluding future premium income), Present Value of Benefits, to avoid distortion by small or negative best estimate liabilities.</p> <p>Flexibility is provided to structure MA portfolios according to specific investment pools. Insurers can define assets and liabilities in each investment</p>

Conditions	Specified in the Second Consultation	Revised Conditions for Third Consultation
		pool.
	The best estimate liabilities for the eligible products should be net of reinsurance ceded.	No change.
Constraints on extent of cash flow mismatching	The cash flows from the eligible assets are required to adequately match the net liability cash flows in each future year of projection. A maximum cash flow shortfall of 15% in aggregate is allowed.	<p>Cash flow matching to be required only in the first 20 years following each valuation date.</p> <p>Excess cash flows from the matching assets over liabilities can be rolled forward to meet deficits in later years but the asset yields used to determine the MA will be adjusted accordingly.</p> <p>The maximum cash flow shortfall of 15% in aggregate is retained.</p>
Other Criteria	<p>The MA is the single additional spread of the weighted average yield-to-maturity of the asset portfolio over the average risk-free liability discount rate, less the spread for default and downgrade:</p> <ul style="list-style-type: none"> The spread for default and downgrade will be prescribed by MAS and captures the cost of default and the cost associated 	<p>No change.</p> <p>The party responsible for calculating and updating the spread (i.e. MAS or industry association(s)) for</p>

Conditions	Specified in the Second Consultation	Revised Conditions for Third Consultation
	with maintaining the credit quality of the asset portfolio should a downgrade occur.	default and downgrade can be further discussed at once the MA framework is reasonably finalised.
	The spread for BBB assets will be constrained to the highest of the calculated assets for AAA, AA and A rated assets.	No change.
	<p>No "cherry picking" - 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:</p> <ul style="list-style-type: none"> Where an insurer that applies the MA is no longer able to comply with the conditions, 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. 	No change.

Annex D

METHODOLOGY FOR DETERMINING COST OF DEFAULT

For a given bond price, tenure and credit rating,

$$Price @ YTM = \sum_1^n DiscFactor(t)CashFlow(t)$$

$$Price @ AdjYTM = \sum_1^n DiscFactor(t)ProbPayout(t)CashFlow(t)$$

$$ProbPayout(t) = \sum Prob(t, Credit Rating) \text{ over all non - default rating}$$

Prob(t, Credit Rating) = probability of being in Credit Rating at time t.

Prob(t, Credit Rating) is built up recursively from time 1 to t, using conditional probabilities derived from ratings transition matrix.

- (a) CashFlow(t) = Coupon at time (t)
- (b) Cashflow(n) = Proceed at time of maturity
- (c) ProbPayout(t) = Probability of payout at time(t), given the current credit rating and loss given default of x%. Using a ratings transition matrix, it is possible to determine the probability that the bond will not default in every future year up to maturity.
- (d) YTM = Current yield to maturity of bond
- (e) AdjYTM = Adjusted yield to maturity after taking into account the probability of payout in future years. Due to defaults, AdjYTM < YTM
- (f) *Cost of Default = YTM - AdjYTM*

The cost of default can be determined based on representative maturities, coupons, and yield observed in the market.

A 20% loading is applied to account for unexpected defaults beyond that observed historically

Annex E

PROPOSED FRAMEWORK FOR ILLIQUIDITY PREMIUM

Eligibility	All SGD and USD products are eligible.
Illiquidity Premium ("IP")	<p>To be specified as k% of the Reference Spread, subject to a possible cap.</p> <p>The actual amounts will be specified later pending the analysis and review of results from the data collection exercise currently being undertaken by MAS with life insurers</p>
Determination of Reference Spread	<p>The Reference Spread ("RS") will be determined based on the average credit spread of a notional Reference Portfolio of assets. It consists of the spread from the Reference Portfolio less costs associated with credit risks i.e. cost of default, and floored at zero.</p> <p>The cost of default is consistent with those used in the calibration of the MA.</p> <p>RS = Average Corporate Spread from Reference Portfolio, adjusted for Cost of Default</p> <p>The Reference Portfolio is determined based on the holding pattern of investment grade bonds held by industry. To smooth the yearly fluctuations, the Reference Portfolio may take into account bond compositions over the past years. The use of a shorter period would give more weight to recent economic environment, whilst a longer period would produce a more stable IP.</p> <p>The Reference Portfolio can be updated at appropriate frequency, e.g. every X years, or as required by MAS, to ensure that it remains relevant. The frequency chosen should balance the objectives of risk responsiveness and the effort required to update the Reference Portfolio.</p> <p>A cap of Y% would be applied to the IP to remove the effects of extreme or anomalous market movements.</p>
Impact of IP on Valuation	<p>IP will be the spread added to the valuation discount rate.</p> <p>The IP will not vary by duration, and would apply to the entire</p>

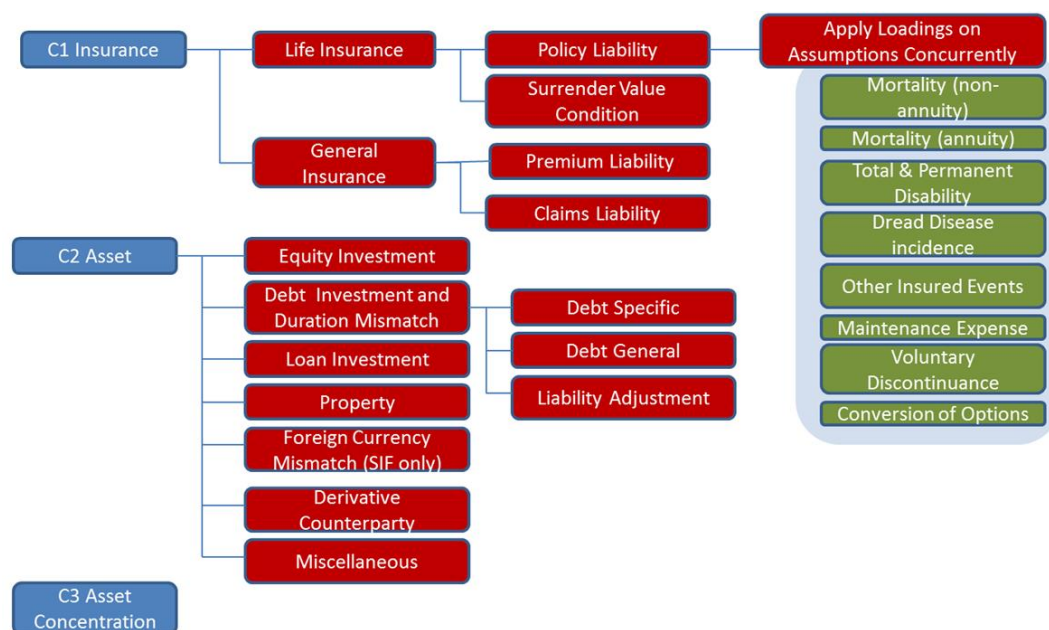
Framework	<p>valuation curve.</p> <p>The IP will not be applicable to products where the MA is applied.</p>
Impact to Capital Requirements	Overall, the IP would not affect the calculation of the total risk requirements.
Other Comments	<p>The actual parameters of the IP can be determined based on QIS and industry feedback.</p> <p>The procedures for updating the IP (including the frequency of update) in the future would be decided later once the elements of the framework has been reasonably finalised. In general, it is important to strike an appropriate balance between risk sensitivity (e.g. updating the IP at a higher frequency) and practicality (e.g. cost and effort in updating the IP).</p>

Parameters in grey highlights are subject to further fine-tuning under QIS 2.

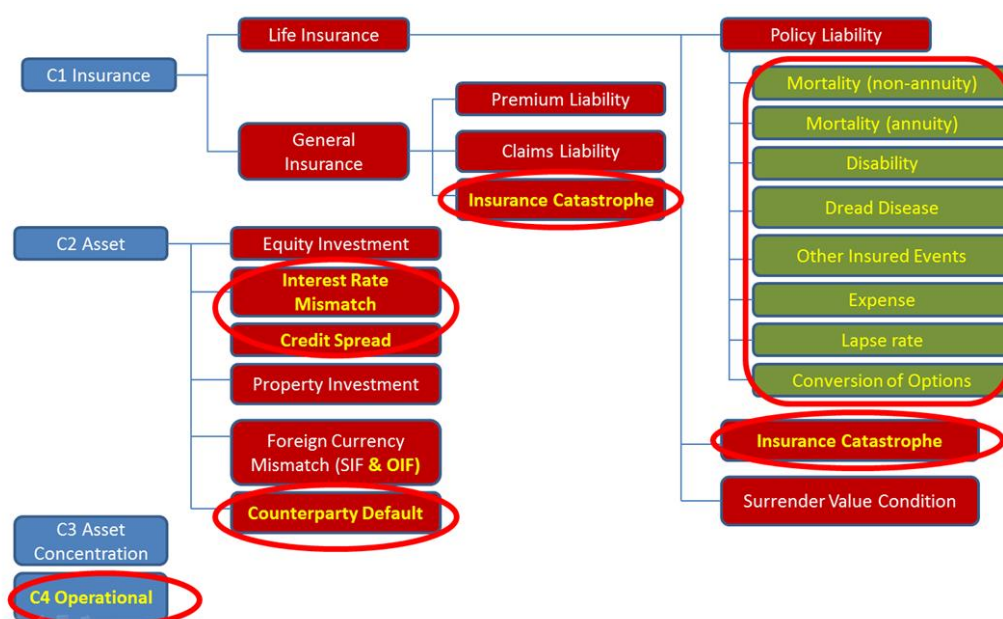
Annex F

ORGANISATION OF RISK MODULES UNDER RBC 2

Under current RBC



Under proposed RBC 2 (2014 consultation)



Annex G

**APPROACHES IN CALIBRATING C2 CORRELATION MATRIX
AND INTRA-RISK DIVERSIFICATION**

Calibrating C2 Correlation Matrix

- The correlation factors between each pair of risks were derived based on the analysis of historical data of the year-on-year changes in the proxies and indices that were representative of the assets that insurers hold. As insurers typically hold SGD-denominated assets, we used indices tracking performance of SG assets (e.g. Straits Times Index ("STI") for equities). Specifically, the correlation parameters between pairs of risks were obtained by calculating the correlation coefficients of the set of year-on-year changes of relevant proxies during the period of study.
- A 99.5% confidence level implies trying to derive tail dependencies or tail correlations between all the various risk pairs. As such, in the statistical calibration of the correlation matrix, we have based these primarily on correlation structures during the stressed period between 1 June 2007 and 1 June 2009, which broadly corresponds to the period of the global financial crisis.

Deriving Intra-risk Diversification

- The intra-risk diversification benefit will be derived from actual historical intra-risk correlation structures embedded within historical scenarios, i.e. the difference between the sum of 99.5% 1-year VaR of all individual risk categories and the 99.5% 1-year VaR from the combined empirical distribution. This is consistent with the way we derived the C2 inter-risk diversification benefits for the purposes of QIS1.
- Intra-risk diversification will be allowed for implicitly within each relevant C2 risk requirement to avoid complexity.

Annex H

**PROPOSED CRITERIA FOR RECOGNITION OF
INTERNAL CREDIT RATING MODEL ("MODEL") FOR UNRATED BONDS**

- 1) Board Oversight
 - a) The Board should have ultimate responsibility for the continuing appropriateness of the model, its use and estimates of parameters. This includes responsibility for the adequacy of control processes. Accordingly, the insurer should undertake efforts to equip the Board with a general understanding of the objectives and basis for the model. The insurer should ensure that the information provided to the Board is adequate for the Board to perform its roles effectively.
 - b) The Board must review and approve all important aspects of the model, including its rating process and estimates of parameters.
 - c) The insurer should inform the Board of material changes to the model. The insurer should also inform the Board of any significant exceptions from established policies and procedures, or weakness in respect of the design and operation of the model. By way of example, persistent occurrences of significant differences between realised and predicted outcomes of estimates of the model parameters for any asset sub-class should be reported.
 - d) The insurer should ensure that the Board establishes comprehensive and adequate written policies and procedures relating to the oversight and control of the design and operation of its model, its use and estimates of parameters. At a minimum, these policies should include –
 - i) The roles and responsibility of the Board, Senior Management and other personnel involved in the design and approval of the model;
 - ii) The internal control processes and independent oversight of the design and operation of the model, its use and estimates of parameters;
 - iii) The matters which the insurer considers material and the authority and approval levels for these matters; and
 - iv) The frequency and level of detail of reporting to the Board.

2) Senior Management Oversight

- a) Insurer should ensure that the Senior Management exercises active oversight to ensure the continuing appropriateness of the model, its use and estimates of parameters.
- b) The insurer should ensure that the Senior Management has a good understanding of the design and operation of the model, its use and estimates of parameters. The insurer should ensure that Senior Management approves material aspects of these areas and material differences between established procedure and actual practice and reports significant issues to the Board on a regular and timely basis.
- c) The insurer should also ensure that Senior Management ensures, on an ongoing basis, that the model –
 - i) Provides for a meaningful assessment of the characteristics of the credit exposures of the insurer, a meaningful differentiation of risk; and
 - ii) is consistent with all applicable rules and regulations as well as established internal policies.
- d) The insurer should ensure that Senior Management and staff in the credit control functions meet regularly to discuss the consistency of rating assignments, areas for improvement, and the status of efforts to improve previously identified deficiencies.
- e) The insurer should ensure that Senior Management ensures that the staff responsible for any aspect of the model, including rating assignments, credit risk control and internal validation, are adequately qualified and trained to undertake their respective roles.

3) Regular reporting to Board and Senior Management

- a) The insurer should integrate internal ratings, estimates of model parameters into regular reporting to the Board and Senior Management on the changes in risk profile of the insurer. The depth and frequency of information provided to these parties shall be commensurate with the operations, size and risk profile of the insurer.
- b) At a minimum, the insurer should ensure that the Board and Senior Management get regular reports on the following material credit portfolios –

- i) Risk profile by internal grade;
- ii) Risk rating migration across grades with emphasis on unexpected results;
- iii) Results of internal validation, including results of replication tests performed to check for systemic biases in rating assignments; and
- iv) Reports from internal audit and credit risk control functions on material issues.

4) Credit Risk Control Function

- a) The insurer should establish a credit risk function that is responsible for the design/selection, implementation and performance of the model of the insurer. The credit risk function should be structurally and functionally independent from the personnel and management functions responsible for originating exposures.
- b) The insurer should ensure that the evaluation of the performance and remuneration of the credit risk control unit takes into consideration how well the credit risks are managed (e.g. the reliability and consistency of rating assignments and predictiveness of estimates of model parameters.)
- c) The credit risk control function should have oversight and supervision responsibilities of the model and process, and ultimate responsibilities for the ongoing assessments of the performance of and alterations to the model.

5) Internal validation

- a) Internal validation encompasses a range of processes and activities that contribute to the internal assessment of the insurer of whether it is capable of deriving consistent and predictive estimates of model parameters and provide regular reports to the Audit Committee. The insurer should have a robust system in place to validate the accuracy and consistency of the model, its processes, and the estimation of all relevant risk components.
- b) The insurer should perform regular internal validation of its model (at least annually).
- c) There should be consistency of rating process with checks against external ratings and across portfolios.
- d) The insurer should ensure that no person responsible for the design or implementation of the model for a class of exposures or the model calibration

process for that class of exposures participates in the validation work relating to that class of exposure.

6) Independent review of internal validation

- a) The insurer should ensure that the Internal Audit reporting to the Audit Committee reviews the internal validation processes of the model, validation processes are implemented as designed and are effective. In performing this role, Internal Audit may seek the assistance of other internal or third party specialists, as long as overall responsibility remains with Internal Audit. Such specialists should not be involved in or responsible for –
 - i) the design, selection or implementation of the model used for that class of exposures;
 - ii) calibration of the model; and
 - iii) the origination of exposures for that class of exposures.
- b) The insurer should ensure that Internal Audit conducts regular reviews (at least annually) of the ongoing valuation of the model.

7) Documentation

- a) The insurer should ensure that the internal validation is comprehensively documented.
- b) The insurer should ensure that the documentation of the rating criteria includes at least the following:
 - i) The rationale for the choice of rating criteria, including analyses demonstrating that the rating criteria and procedures are likely to result in ratings that meaningfully differentiate risk, and that the rating criteria have taken all relevant and material transaction characteristics into account;
 - ii) The rationale for assigning a security to a particular rating where more than one rating methodology is used;
 - iii) The relationship between security grades in terms of the level of risk each grade implies, and the risk of each grade in terms of both a description of the probability of default typical for securities assigned to that grade and the criteria used to distinguish that level of credit risk;

-
- iv) The periodic review of rating criteria and procedures to determine whether the rating criteria remain fully applicable to the current portfolio taking into account external conditions.
 - c) The insurer should ensure that the documentation of the rating process includes at least the following:
 - i) The responsibilities of the parties that rate and approve rating grades;
 - ii) The definition of what constitutes a rating exception and override, and the situations where exceptions and overrides can be used and the approval authorities for such exceptions and overrides;
 - iii) The frequency of rating reviews, including the policy on refreshing relevant criteria;
 - iv) The history of significant changes in the rating process to enable easy identification of any changes made to the rating process; and
 - v) The organisation of rating assignment, including the internal control structure.

Annex I

QUESTIONS ON INFRASTRUCTURE FINANCING

Please provide reasons for your responses.

1. What are the types of infrastructure investments¹ that insurers are keen on or would avoid? Is there a preference for public infrastructure projects over private infrastructure projects?
2. A typical infrastructure project has three distinct phases – planning, construction and operational. Each phase exhibits different risk and return, with tendency for higher default and restructuring risks in the earlier stages of large infrastructure projects. The stability of the revenues of an infrastructure project also has a significant impact on risk.
 - i) Are insurers more interested in infrastructure projects that are in the operational phase (as opposed to planning and construction), where contractual arrangements considerably reduce the revenue risk and lower default risk?
 - ii) If operational phase is not more preferred, what mechanisms will allow a sufficient mitigation of the risks associated with the planning and construction phase? What are the requirements that these mitigants have to meet?
3. Are there any specific sectors (e.g. transportation, communication and power links, water, and environmental sustainability etc.) within the infrastructure investments that insurers are interested in or would avoid?
4. Are there any specific regions (e.g. developed markets, emerging markets, US, Europe, Asia etc.) that insurers are more keen on or would avoid?

¹ Respondents are encouraged to be more precise in their description of the types of infrastructure investments (e.g. infrastructure debts, infrastructure equities etc) that they are keen on, so that MAS can better assess how these types of assets can fit within the proposed structure of the market risk modules under RBC 2.

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5. What criteria do insurers use to assess infrastructure investments (e.g. credit rating, liquidity, time horizon)?
 6. What are the attributes/characteristics that would make an infrastructure investment an attractive risk-adjusted investment class for insurers?
 7. What are the insurers' views on the current availability of the infrastructure investments that they are keen on?
 8. For the different type of infrastructure investments (e.g. infrastructure equity, infrastructure debt) that the insurers are keen on, are there suggestions on the way in which they should be risk charged? In giving your response, please provide justifications (including supporting data) why the proposed capital treatment for the main asset classes under RBC 2 would not be appropriate.

Annex J

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 Insurance Act ("the Act") by the insurer, any financial resource adjustments and any adjustments for asset concentration (as mentioned in the section on C3 Requirements earlier).

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 subparagraph (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 instrument²;

² 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;

-
- g) the capital instrument is callable at the option of the insurer only after a minimum of five years from the issue date³, 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 exercised⁴; 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 insurer⁵; or
 - (B) The insurer demonstrates that its capital position is well above the minimum requirements after the call option is 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 incentive to redeem. The insurer shall, however, not do anything to create an expectation that the call will be exercised.

³ 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.

⁴ 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).

⁵ Replacement issues can be concurrent with, but not after the capital instrument is called.

-
- 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,
 - i. The insurer has full discretion at all times to cancel distributions or payments⁶;
 - 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

⁶ 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.

Further, 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.

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 features⁷ through –
 - i. a provision under which it converts to ordinary shares if the CET1 Capital of the insurer falls below 65% 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 65% of 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 down⁸ for all such instruments shall be at least the amount needed to immediately return the insurer's CET1 Capital to 65% of the total risk requirements

⁷ The principal loss absorption need not be triggered if the insurer is able to maintain a CET1 capital of 65% or more via other means (such as but not limited to capital injection).

⁸ The instrument cannot be written back up even if there are profits in the future.

(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 has 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 frame⁹;
- 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 special purpose entity ("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 AT1 Capital;
- r) the main features of the instruments, are disclosed accurately and in a manner that is easily understood by an investor; and
- 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.

⁹ 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.

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 subparagraph (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%
$3 < x \leq 4$	80%
$2 < x \leq 3$	60%
$1 < x \leq 2$	40%
$x \leq 1$	20%

- iii. there are no step-ups or other provisions that mandate or create an incentive for the insurer to redeem the capital instrument².
- g) the capital instrument is callable at the option of the insurer only after a minimum of five years from the issue date¹⁰, 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^{4, 11};
 - iii. The insurer shall not exercise a call option unless -

¹⁰ 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.

¹¹ 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.

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- (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;
- m) the main features of the instruments, are disclosed accurately and in a manner that is easily understood by an investor; and
- 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.
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5. Treatment of Existing Instruments

Capital instruments that have been approved by MAS prior to the implementation of RBC 2 shall continue to qualify as Tier 1 capital (for an existing instrument approved as a Tier 1 resource) and Tier 2 capital (for an existing instrument approved as a qualifying Tier 2 instrument).

Annex K

TECHNICAL SPECIFICATIONS FOR QIS 2

[\[Separate Attachment\]](#)



Monetary Authority of Singapore