Annex K: Technical Specifications for QIS 2

MAS

Monetary Authority of Singapore

1.   APPLICABILITY

1.1   QIS 2 has been designed to gather information relating to the proposals discussed in the consultation paper "*RBC 2 Review – Third Consultation*" ("main consultation paper"), as well as to help evaluate the impact of the revised RBC 2 proposals.

1.2   Consistent with the approach taken under QIS 1, 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 assess the impact of revised RBC 2 proposals on their capital positions and highlight any implementation issues experienced in conducting QIS 2.

1.3   Locally incorporated reinsurers which are headquartered in Singapore (where MAS is the home supervisor) are to assume that RBC 2 will be applied immediately on its offshore insurance funds ("OIF") as well as its branches for the purpose of QIS 2. Locally incorporated reinsurers that are headquartered overseas (where MAS is not the home supervisor) will be subject to the current simplified solvency requirements[1], whilst reinsurance branches will be exempt from solvency requirements for the offshore insurance fund[2]. This is elaborated in Section 7 of the main consultation paper.

1.4   **Insurers are required to submit the QIS 2 results in the format prescribed in the Excel Workbook ("Workbook").** The forms are designed to capture the information needed for the analysis. The Workbook must not be modified in any way. **In addition, insurers are required to complete a Questionnaire**. Any material assumptions made should be disclosed in the Questionnaire.

1.5   **The projections under QIS 2 are to be based on the valuation date of 31 December 2015.** All amounts are to be shown in thousands of Singapore dollars (SGD).

1.6   Insurers are required to submit results on the following bases:

   a)   **Basis 1**: Insurers will be required to incorporate all RBC 2 proposals with the exception of the Matching Adjustment ("MA") and Illiquidity Premium ("IP");

   b)   **Basis 2**: Insurers will be required to incorporate all RBC 2 proposals including MA and IP.

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[1] For avoidance of doubt, the OIF of locally incorporated reinsurers that are headquartered overseas (where MAS is not the home supervisor) is only subject to the current simplified solvency requirements (as described in footnote 98 of the main consultation paper), and not subject to any of the requirements (including C3 requirements and operational risk requirement) set out in Section 4 of this document.

[2] For avoidance of doubt, the OIF of licensed reinsurance branches is exempted from any form of solvency requirements, including those set out in Section 4 of this document (e.g. C3 requirements and operational risk requirement).

1.7   **Basis 2 will not be relevant for insurers writing general business** as the intention is to apply MA and IP on life business only. However, MAS has posed a question in the main consultation paper (Question 3) on whether MA and IP will be relevant and helpful for general business, especially in cases where the liabilities are long-term.

1.8   **Results for Basis 1 are to be submitted in the enclosed Workbook named MAS_QIS2.xls**

1.9   As mentioned in the main consultation paper, MAS is working closely with the SAS on the details of the MA and IP design. **The technical specifications for MA and IP (which will help inform Basis 2) will be provided within one month after the issuance of this consultation paper**. These will also include some sensitivity tests on market movements. Separate workbooks will be provided for this.

1.10   Completed Workbook(s) and Questionnaire should be submitted to MAS no later than **20 October 2016**. Insurers are strongly encouraged to send all QIS-related queries to QIS_2@mas.gov.sg**.**

1.11   **The Workbooks should be submitted by the insurer via an email attachment to the insurer's liaison officer in MAS, using AES 256 encryption or higher.** The insurers should deliver the corresponding password of minimum 12 characters in length or encryption key via a separate transmission channel (e.g. telephone) to MAS. MAS uses WinZip12 AES 256 encryption to protect such information.

2. PRESCRIBED CAPITAL REQUIREMENT ("PCR") AND MINIMUM CAPITAL REQUIREMENT ("MCR")

2.1   Capital Adequacy Ratio ("CAR") and Fund Solvency Ratio ("FSR") are still relevant under RBC 2, meaning that insurers will still need to compute these two ratios. The CAR is the ratio of Financial Resources ("FR") / Total Risk Requirements ("TRR") at the company level, whilst the FSR is the ratio of FR / TRR at the fund level.

2.2   MAS will calibrate the MCR as a percentage of the PCR at a later stage, based on the results of QIS, once the design of RBC 2 is finalised. The focus of QIS 2 will be on the PCR.

2.3   As mentioned in the main consultation paper (paragraph 3.3), insurers are required to hold sufficient FR to meet the TRR[3] which are calibrated at VaR(99.5%) over a one year period. This is known as the PCR. Sections 4 and 5 provide details on how risk requirements and FR are computed respectively. PCR is to be met at both a company as well as fund level. An insurer would have met the PCR at the company and fund level when its CAR and FSR are at least 100% respectively.

2.4   However, as mentioned in paragraph 3.11 of the main consultation paper, MAS is prepared to explore the feasibility of more latitude in the fund level PCR requirements. MAS will study under QIS 2, the impact of requiring insurers to maintain PCR at the adjusted fund levels.

2.5   Therefore, insurers are required to provide solvency information under two approaches as follows:

Current Fund Levels	Alternative "Adjusted" Fund Levels
• 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	• SIF – Par • SIF – Others • OIF – Par • OIF – Others

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[3] The organisation of the risk requirements, as well as the definitions of the risks under RBC 2 can be found in **Appendix 1**.

2.6   Form B of the Workbook should be completed as if insurers are required to hold sufficient FR to meet the TRR for each insurance fund. The TRR for a company will be the sum of the TRR across its funds.

2.7   Form C of the Workbook should be completed as if insurers are required to hold sufficient FR to meet the TRR for "Adjusted" fund levels, namely SIF-Par, SIF-Others, OIF-Par and OIF-Others. Similarly, the TRR for a company will be the sum of the TRR across these four adjusted funds.

3.   VALUATION OF ASSETS AND LIABILITIES

3.1   Unless otherwise specified in this document, valuation of all assets and liabilities should be done in accordance with the Insurance (Valuation and Capital) Regulations 2004 for the purpose of QIS 2.

Discounting Approach

Discounting of life business

3.2   As mentioned in paragraphs 4.13 of the main consultation paper, MAS will continue to work with the industry on the extrapolated yield curves, including the choice of the Ultimate Forward Rate ("UFR") and the extrapolation methods.

3.3   Meanwhile, for the purpose of QIS 2, MAS has come up with the yield curves to be used for discounting SGD denominated liabilities, based on a last liquid point of 20 years, and a UFR of 3.5%[4].

3.4   Whilst the intention is to adopt the same extrapolation approach to derive the risk-free yield curve for other currencies, MAS has only derived the yield curve for USD denominated liabilities for practical reasons. For liabilities in other currencies besides USD, the approach specified in MAS 319 will still apply for QIS 2. The bulk of the liabilities of life insurers are denominated in SGD and USD.

Discounting of general business

3.5   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. Where discounting is carried out, the approach will be the same as for life business for both SGD and non-SGD denominated liabilities (except that MA and IP will not apply).

Determination of Risk-Free Discount Rate

3.6   The spot "risk-free discount rate" to be used in discounting liability cash flows is provided in a separate Excel spreadsheet for SGD and USD denominated liabilities. The methodology[5] for the determination of the discount rates is specified in the Excel

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[4] MAS has leveraged on the work done by IAIS on the design of the global insurance capital standard. The UFR is based on OECD's long-term projections of the real interest rate and inflation rate (as explained in paragraph 4.12 of the main consultation paper).

[5] For the purpose of QIS 2, MAS has applied simpler methods to extrapolate the yield curve, instead of using other more sophisticated methods such as Smith-Wilson. As mentioned, the extrapolation method will be developed later with the industry.

spreadsheet. For simplicity, the approach specified in MAS 319 for will still apply for QIS 2 for liabilities in other currencies.

3.7   Additional information is requested in the Excel spreadsheet on the discount rates used for the first 20 years (for SGD liabilities) and first 30 years (for USD liabilities) under the current RBC framework, to facilitate comparison[6] against the discount rates provided for QIS 2.

Determination of Matching Adjustment and Illiquidity Premium

3.8   MAS will provide the MA and IP specifications, and the scenarios for testing the MA and IP within one month of the issuance of the third consultation paper on RBC 2 review, which will also include some sensitivity tests on market movements.

Contract boundaries for valuation of long-term health policies[7]

3.9   For the purpose of QIS 2, the boundaries of the contract for long-term health policies should be determined as follows:

- The term of the contract ends on the date when the insurer has the right to reassess the risk of the contract (on its own or as part of a portfolio of similar policies) and amend the premium such that the premium fully reflects the risks, unless the insurer has the ability, and right or willingness to compel[8] the policyholder to pay the premium. If the insurer is able (and willing) to compel the policyholder to pay the premium, all cash flows, including cash flows on or after the date on which the insurer has the right (or ability) to amend the premium such that it fully reflects the risk of the policy, are considered to be falling within the contract. The following table summarises how contract boundaries should be determined.

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[6] Under the current RBC framework, there are various approaches in determining the discount rates, as specified in SAS Guidance Note GN L02. Details can be found at http://www.actuaries.org.sg/?q=guidance_notes.

[7] MAS is currently engaging SAS on the definition of contract boundaries and valuation methodology for long-term health policies. Such work will continue after the issuance of this consultation paper.

[8] One interpretation is that the insurer can compel the policyholder to pay the premiums at all times, as otherwise the policyholder will not be able to continue enjoying the benefits of the policy. The policyholder has to continue paying the premium due to the need and want of maintaining the existing insurance coverage as there is no similar alternative in the market.

	Has the ability and right/willingness to compel the policyholder to pay the premium	Does not have the ability and right/willingness to compel the policyholder to pay the premium
Right to reassess the risk of contract and amend the premium such that premium fully reflects the risk	All cash flows belong to the existing contract	Cash flows on or after the date on which insurer has the right (or ability) to amend the premium do not belong to the existing contract
Does not have the right to reassess the risk of contract and amend the premium such that premium fully reflects the risk		Refer to SAS GN L02 for guidance

3.10   The above definition only considers, for the purpose of QIS 2, long-term health policies which are guaranteed renewable with non-guaranteed premium rates. MAS will continue to work with SAS to see if there are merits to extend the definition to other contracts at a later stage, after reviewing the responses from consultation paper as well as the QIS 2 results.

3.11   Insurers are required to provide the reasons and justification for its choice of contract boundaries in the Questionnaire.

Valuation of long-term health policies

3.12   For the purpose of QIS 2, insurers are required to hold policy liabilities for long-term health policies as the **sum** of the following components:

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, including PAD. The term of projection would depend on how insurers interpret the contract boundary definition as set out in paragraph 3.9. Insurers are required to provide the rationale in the Questionnaire; and

b)   An amount which is adequate to cover the cost of claims which has already been incurred prior to the valuation date i.e. claims liabilities. This comprises reported but not settled ("RBNS") claims and incurred but not reported ("IBNR") claims. Insurers should choose an appropriate methodology to determine RBNS and IBNR and provide details of how RBNS and IBNR claims are determined in the Questionnaire.

3.13   In addition, insurers should consider holding additional claims reserves for liabilities which may not have been included in paragraph 3.12 (e.g. long-term recurrent claims arising

from claims incurred prior to valuation date). Insurers are required to provide details of any additional claims reserves set up in the Questionnaire.

Valuation of Investment-Linked Funds

3.14   For the purpose of QIS 2, insurers are to project unit and non-unit reserves at risk-free rate (as defined in paragraph 3.6) for investment-linked funds. This also means that insurers are to provide the negative reserves (after applying the proposed C1 insurance shocks) for regulatory adjustment in Forms B to D of the Workbook based on Approach 2 (i.e. project and discount both unit and non-unit reserves at risk-free rate) as described in paragraph 6.42 in the main consultation paper.

3.15   To assess the impact of the alternative approach of projecting and discounting using best estimate fund growth rate, i.e. Approach 1, additional information has been requested under the tab "Form A-1" in the Workbook.

3.16   Insurers are required to provide details of how the fund growth rate is derived in the Questionnaire.

Valuation for Universal Life ("UL") Policies

3.17   As mentioned in paragraph 4.40 of the main consultation paper, MAS proposes to remove the surrender value floor from the valuation basis, regardless of whether there is a no-lapse guarantee ("NLG") feature or not. However, there will be a need to compute a mass lapse risk requirement for each UL policy.

3.18   The policy liability for each UL policy will be calculated as the **higher** of the following 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"); and

   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")

   For avoidance of doubt, the current cost of insurance charges should be used in determining both BEL and MCL above.

3.19   For a given UL policy, where the surrender value ("SV") is higher than the policy liability, the excess of SV over the policy liability is set up as an additional capital requirement (UL_Mass Lapse).

   a)   For UL each policy,
      i.   Policy Liability = max (BEL, MCL)
      ii.   UL_Mass Lapse = 30% * max(SV − Policy Liability, 0)

b)   C1, C2 requirements will be based on MCL without surrender value floors

UL_Mass Lapse will be included with the Lapse Risk Requirement for the purpose of calculating the diversified C1 component.

3.20   UL_Mass Lapse should be calculated at a policy level.   However, additional information is requested in the Workbook on calculating UL_Mass Lapse on a product group level instead of policy level, for further analysis.   Information is also requested on the policy liabilities calculated on the current RBC valuation basis, as well as the impact to the duration mismatch risk requirement (as defined under the current RBC) using the proposed valuation basis above. This will allow MAS to better understand the impact of the proposed changes on the interest rate mismatch risk.

Provision for Adverse Deviation ("PAD")

3.21   Life insurers may need to update the current PAD methodology or assumptions following the proposed changes to calibration of the C1 requirements, if applicable. The method of setting the PAD as half of the prescribed loadings for modified policy liabilities or modified minimum conditional liabilities is a more common practice for determining the PAD, specified under SAS GN L02. Regardless of the method used, the actuary should be able to justify the appropriateness of the approach used, and should take into account the principles and considerations specified in SAS GN L02.

4.   COMPONENTS OF REQUIRED CAPITAL

C1 Requirements – Life Business

4.1   The shocks to be applied for the purpose of QIS 2 are as follow:

C1 Risk Requirements	Factors
Mortality Risk Requirement	+20% to Best Estimate ("BE") mortality rates where the payment of benefits is contingent on mortality risk
Longevity Risk Requirement	-25% to BE mortality rates where the payment of benefits is contingent on longevity risk
Disability Risk Requirement	+20% to BE disability rates where the payment of benefits is contingent on disability risk
Dread Disease Risk Requirement[9]	+40% to BE rates during periods <u>where premium rates are guaranteed</u> and +30% to BE rates during periods <u>where premium rates are not guaranteed</u>, and where the payment of benefits is contingent on dread disease risk
Other Insured Events (Accident & Health) Risk Requirement[10]	+40% to BE rates during periods <u>where premium rates are guaranteed</u> and +30% to BE rates during periods <u>where premium rates are not guaranteed</u>
Insurance Catastrophe Risk Requirement[11]	Absolute increase in the rate of policyholders dying over the following year of 1 per 1000 (only applicable to policies which are contingent on mortality risk)
Expense Risk Requirement	120% in first year and 110% thereafter of the insurer's best estimate of its future experience (including expense inflation)

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[9] For limited pay policy, the 40% shock should apply where the premium term has ended as there are no further premium receipts after that.

[10] In the main consultation question 14, MAS seeks comments on the specific areas which MAS will work with LIA and SAS on with respect to exploring the feasibility to collect more granular data from insurers and calibrate the risk requirement. This work is inter-linked with the work on the definition of contract boundaries and the valuation methodology of long-term health policies. Meanwhile, the calibration will stay for QIS 2.

[11] As mentioned in paragraph 5.40 of the main consultation paper, MAS considers it conceptually sound to have the morbidity component in this risk module, but recognises that it is still an evolving area and not many jurisdictions have the morbidity component. Hence MAS proposes to monitor developments internationally before deciding to incorporate the morbidity component again.

Lapse Risk Requirement	+50% on BE lapse rates or -50% on BE lapse rates, whichever produces a higher liability value
	Lapse risk is the risk of loss or change in liabilities due to a change in the expected exercise rates of policyholder options. The module takes into account all legal and contractual policyholder options which can significantly change the value of the future cash flows.
	This includes options to fully or partly terminate, surrender, renew, extend, reduce or increase insurance coverage as well as reduction or suspension of premium payments and changes in take up options such as annuitisation options.
	As such, insurers need to consider the type of options for the upward shock or downward shock appropriately. For example, where the option allows for an increase in insurance cover (i.e. extension of cover), the +50% should be applied to the rate that would apply if the option is not taken up under the upward shock scenario. As a rule of thumb, **the +50% shock is meant to be applied in a manner that increases lapses and the -50% is meant to applied in a manner that decreases lapses.**
	For UL policies, UL_Mass Lapse will be added to the lapse risk requirement.
Conversion of Options Risk Requirement	+50% on BE conversion rates (for options provided to the policy owner) or -50% on BE conversion rates, whichever produces a higher liability value

4.2   There are different ways to design an insurance product. For example, long-term care can be provided to meet the needs of people with either a dread disease or disability, resulting in them not being able to care for themselves for long periods of time. The shock to be applied will correspond to the underlying best estimate assumption. Insurers are also encouraged to provide views on how the segregation of the different risk modules can be made clearer in their response to the consultation paper.

4.3   Similarly, the decision whether to apply the C1 Mortality shock or C1 Longevity shock for a given policy should be done based on the shock that result in higher liabilities.

4.4   The insurer should apply the following correlation matrix to derive the diversified C1 requirements for life business:

	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

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

$$\sqrt{\sum CorrLife_{r,c} * Life_r * Life_c}$$

where

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

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

   C1 requirement is floored at zero.

Please note that the formula has been built into the Workbook to automate the computation of the diversified C1 requirements.

4.6   An example has been provided in the Workbook to illustrate how C1 requirements can be derived, e.g. insurance shocks being applied to BEL, and when diversification and PAD should be taken into account.

4.7   MAS is also seeking comments on the relevance, design and calibration of the mass lapse event within the computation of the lapse risk requirement (Question 17 of main consultation paper). In order to assess the impact of the mass lapse risk component, additional information is requested under the tab "MLapse" of the Workbook for the best estimate liabilities before and after the following prescribed shock.

An immediate surrender of 30% for retail (i.e. individual) policies and an immediate surrender of 50% of non-retail (i.e. group) policies for all surrenderable products (i.e. products that provide cash value upon surrender)

C1 Requirements - General Business

4.8   The methodology and factors to derive C1 requirements for general business will remain the same as specified in the Insurance (Valuation and Capital) Regulations 2004.

C2 Requirements

4.9   For the purpose of QIS 2, the shocks to be applied are as follow:

C2 Requirements	Factors
Equity Investment Risk Requirement	To calculate the equity investment risk requirement, insurers are to: ▪ Apply the following factors to the market value of each equity exposure: <table><tr><td>Equities listed in Developed Markets</td><td>40%</td></tr><tr><td>Other equities[12]</td><td>50%</td></tr></table> ▪ The equity investment risk requirement is then taken to be the aggregate of the calculations for all equity exposures **Additional Notes:** **Note 1:** The types of instruments for which the equity investment risk requirement is applicable to are as specified in paragraph 2(1) of the Fourth Schedule of the Insurance (Valuation and Capital) Regulations 2004. Debt instruments which are convertible into equity at the option of the issuer or automatically by the terms of the instruments shall be characterised as equity exposures. Insurer shall convert its equity derivative instruments into notional positions in the relevant underlying equity instruments and use the current market value of the underlying instruments to calculate its market risk capital requirement for equity position risk. **Note 2**: Insurers should refer to the constituent countries in MSCI's World Equity Index for countries that are to be classified as Developed Markets for risk charging purposes. For ease of reference, this list has been provided in **Appendix 2**. **Note 3**: Please refer to **Appendix 3** for the treatment of Collective

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[12] These include equities listed in other markets, unlisted equities, including private equity and hedge funds, and commodities.

	Investment Schemes ("CIS"). **Note 4:** Investments in commodities should be treated as equity investments, and the risk charge for "Other equities" will apply.
Interest Rate Mismatch Risk Requirement	▪ To calculate the interest rate mismatch risk requirement, insurers are to: i. Recompute the value of interest rate sensitive assets and liabilities under the upward interest rate scenario, adjusting the **relevant yield curve**[13] by the absolute upward interest rate adjustment, and calculating the resulting change in Net Assets[14]. ii. Recompute the value of interest rate sensitive assets and liabilities under the downward interest rate scenario, adjusting the relevant base yield curve by the absolute downward interest rate adjustment, and calculating the resulting change in Net Assets. iii. Taking the larger of the reduction in Net Assets from (i) and (ii) as the interest rate mismatch risk requirement.

[13] In order to derive the absolute upward and downward interest rate adjustments, insurers are to multiply the percentage adjustments by the:

- For policy liabilities, the risk-free discount rate as prescribed under the scenario;

- For assets, the government yield curve relevant to the asset, i.e. based on the currency that the asset is denominated in, e.g.

  - For risk-free assets (i.e. government securities), refers to the corresponding government yield curve;

  - For other assets, refers to the sum of the government yield curve plus a constant spread that equates the discounted present value of cash flows to the market value of the asset

[14] Taken to be the value of the Assets less Liabilities

Time of Cash Flow	Upward Adjustment (%)	Downward Adjustment (%)
3M	100	-75
6M	100	-70
1Y	100	-70
2Y	100	-70
3Y	95	-65
4Y	95	-65
5Y	90	-60
6Y	85	-55
7Y	80	-50
8Y	80	-50
9Y	75	-45
10Y	70	-40
11Y	65	-40
12Y	60	-35
13Y	60	-35
14Y	55	-30
15Y	50	-30
16Y	45	-30
17Y	40	-30
18Y	35	-25
19Y	30	-25
20Y+	25	-25

For cash flows that occur between the time periods specified in the table above, please apply the upward and downward adjustments of the closest term.

Simplified approach

i. Insurers may use the modified duration of the asset to approximate the change in value of each interest rate sensitive security.

ii. For bonds with optionality (e.g. callable bonds), insurers should use the effective duration and this can be determined using:

o Under upward interest rate up scenario, use term to final maturity.
o Under downward interest rate scenario, use term to first call date.

The "after-shock" market price of the callable bond should not exceed the present value of [call price + all cash flows payable before and on the first call date].

Additional Notes:

Note 5: The types of instruments for which the interest rate mismatch risk requirement is applicable to are specified in paragraph 3(1) of the Fourth Schedule of the Insurance (Valuation and Capital) Regulations 2004 under debt investment risk requirements. Debt instruments which are convertible into equity at the option of the issuer or automatically by the terms of the instruments shall be characterised as equity exposures. Insurer shall convert its interest rate-related derivatives into notional positions in the relevant underlying instruments and use the current market value of the principal amount of the underlying instruments to calculate its interest rate risk capital requirement.

Note 6: For the purpose of calculating Net Assets, the liabilities shall refer to:

- In respect of life business, the Policy Liabilities for non-participating funds or investment-linked funds and the minimum condition liability for participating funds. For universal life, the minimum condition liability should be used.

- In respect of general business, the Policy Liabilities, An insurer may elect not to recompute the value of liabilities for an insurance fund established and maintained in respect of general business, in which case the change in value of liabilities under the upward and downward interest rate scenarios is zero.

Note 7: For clarity, the upward and downward percentage interest rate adjustments are to be applied on the relevant base yield curve.

The relevant yield curve after applying the interest rate adjustments **is subject to a minimum of zero**.

Note 8: The calculated absolute interest rate adjustments are to be subject to **a maximum of 200 basis points** for both upward and downward scenarios.

Note 9: Please refer to **Appendix 4** for more instructions and guidance related to the calculation of the interest rate mismatch risk requirement, including the use of modified duration approach. Some examples are also provided for insurers' reference.

Note 10: Please refer to **Appendix 5** on the recognition of diversification between funds for the interest rate mismatch risk

	requirement.

Credit Spread Risk Requirement	▪ To calculate the credit spread risk requirement, insurers are to:
	
	  i. First identify the relevant constant <u>basis point credit spread adjustment</u> in the table below for each credit-related security, which is to be determined based on the remaining term and credit rating[15] of the security.
	
	  ii. Insurers should then revalue the security by adding this constant credit spread adjustment on the relevant yield curve for the security, calculating the resulting fall in value of the security.
	
	  iii. Repeat the same calculation for all credit-related securities, and take the aggregate resulting fall in value of all securities as the credit spread risk requirement.

Short-term ratings

Credit Rating[16]	A1+	A1	A2	A3	B and below
Adjustment	105	120	165	245	540

Long-term ratings

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

<u>Simplified approach</u>

  i. Insurers may use the modified duration of the asset to

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[15] 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.

[16] The ratings illustrated in this table make reference to S&P's long and short term ratings. Insurers can also use equivalent ratings from Moody's Investor Services, Fitch Inc and AM Best Company to derive the appropriate credit spread adjustment.

approximate the change in value of each credit-related security.

ii.   For bonds with optionality (e.g. callable bonds), insurers should use the effective duration and this can be determined using:

o   Under upward interest rate up scenario, use term to final maturity.
o   Under downward interest rate scenario, use term to first call date.

The "after-shock" market price of the callable bond should not exceed the present value of [call price + all cash flows payable before and on the first call date].

Additional Notes:

Note 11: The types of instruments for which the credit spread risk requirement is applicable to are as specified in paragraph 3(1) of the Fourth Schedule of the Insurance (Valuation and Capital) Regulations 2004 under debt investment risk requirement. Debt instruments which are convertible into equity at the option of the issuer or automatically by the terms of the instruments shall be characterised as equity exposures. Insurer shall convert its credit-related derivatives into notional positions in the relevant underlying instruments and use the current market value of the principal amount of the underlying instruments to calculate its credit risk capital requirement.

Note 12: For debt securities issued by a Statutory Board in Singapore and recognised multilateral agencies (as listed in Table 2 of the Sixth Schedule of the Insurance (Valuation and Capital) Regulations 2004), the credit spread adjustments would be 50% of that applied on an "AAA-rated" corporate bond.

Note 13: Please refer to **Appendix 4** for more instructions and guidance related to the calculation of the credit spread risk requirement.

Note 14: For unrated debt securities, these are to adopt a credit spread adjustment in between "BB" and "BBB", which is as follows:

Term\Credit rating	Unrated
Up to 5 years	325
Between 5 to 10 years	298
More than 10 years	285

	Note 15: Debt securities that are issued by central governments or central banks of countries or territories that have a sovereign credit rating of at least "A-", are exempt from the credit spread risk charge module. **Note 16**: Debt securities that are issued by central governments or central banks that have a sovereign credit rating lower than "A-" are subject to the credit spread risk requirement; 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 risk module. **Note 17**: Debt securities that are issued by public sector entities (equivalent of Singapore statutory boards in other countries) that are fully guaranteed by central governments or central banks, use the credit rating of the sovereign credit ratings when deriving the credit spread adjustment that should be applied under this risk module. For unrated debt securities that are issued by public sector entities that are not fully guaranteed by central governments or central banks, a credit spread shock of between "BBB" and "BB" will apply. **Note 18:** Please refer to **Appendix 6** for the treatment of guarantees and collaterals. **Note 19**: Please refer to **Appendix 7** for the treatment of structured products and derivatives.
Property Investment Risk Requirement	To calculate the property investment risk requirement, insurers are to apply: ▪ 30% risk charge to the current market value of each property exposure for immovable property, for both investment and self-occupied purpose; or ▪ Look-through approach (as described for CIS) for collective real estate investment vehicles. Where the insurer chooses not to or is unable to adopt a look-through approach, a risk charge of 50% on the value of the CIS will apply. The property investment risk requirement is then taken to be the aggregate of the calculations for all property exposures. <u>Additional Notes:</u> **Note 20:** Investments in companies that are engaged in real estate

	management or real estate project development or similar activities should be treated as equity investments.

Foreign Currency Mismatch Risk Requirement	▪ This risk module is applicable to all insurance funds of the insurer established and maintained under the Act (i.e. SIF and OIF)
	
	 ▪ The foreign currency mismatch risk charge is 12%.
	
	 ▪ In calculating the foreign currency mismatch risk exposure:
	
	   i. For SIF, the same calculations as prescribed in the Insurance (Valuation and Capital) Regulations 2004[17] will apply, i.e. foreign currency risk exposure is the higher of
	
	     a. the aggregate of net positions of the insurer in currencies which net open position is positive;
	
	     b. the absolute value of the aggregate of net open positions of the insurer in currencies which net open position is negative,
	
	   less 10% of the total value of assets in the insurance fund, subject to a minimum of zero.
	
	   ii. For OIF, the same calculations as prescribed in the Insurance (Valuation and Capital) Regulations 2004 for SIF will apply, except that the concession of 20% of the total value of fund assets will apply instead of 10% i.e. foreign currency risk exposure is the higher of
	
	     a. the aggregate of net positions of the insurer in currencies which net open position is positive;
	
	     b. the absolute value of the aggregate of net open positions of the insurer in currencies which net open position is negative,
	
	   less 20% of the total value of assets in the insurance fund, subject to a minimum of zero.

Counterparty Default Risk Requirement	▪ This will cover the following sub-modules: i. Loan counterparty risk (currently addressed in the loan

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[17] Regulation 7 of the Fourth Schedule of the Insurance (Valuation & Capital) Regulations 2004

| | investment risk requirement)

ii. Derivative counterparty risk (currently addressed in the derivative counterparty risk requirement)

iii. Reinsurance recoverable counterparty risk (currently addressed in the miscellaneous risk requirement)

iv. Outstanding premiums counterparty risk (currently addressed in the miscellaneous risk requirement)

v. Bank deposit counterparty risk (currently addressed in the miscellaneous risk requirement)

vi. Any other counterparty risk for exposures which are currently addressed in the miscellaneous risk requirement and that have not been addressed by the credit spread risk module, including but not limited to:

   o intra-group balances not related to a contract of insurance

   o any general guarantee of indebtedness and acceptance originating from the insurer which has not been accounted for as a liability in respect of policies

   o any contingent liability relating to any specific transaction to the insurer, other than any guarantee or acceptance that has been accounted for as a liability in respect of policies

▪ The Counterparty Default Risk Charge will not be applicable to balances due from other insurance funds, shareholders fund and overseas branches.

▪ In order to calculate the counterparty default risk requirement, the insurer shall:

   i. first calculate the risk exposures for each counterparty in each sub-module. The calculation of risk exposures remains the same as that prescribed in the Insurance (Valuation and Capital) Regulations 2004;

   ii. calculate the risk requirement for each counterparty as the product of the risk exposure to a particular |

counterparty in (i) and the relevant default risk factor based on the credit rating[18] of the counterparty as set out in **Table 1**:

   a. For Reinsurance Recoverables ≤ 1 year; otherwise 100% risk charge applies

   b. For Outstanding Premiums (Direct/General/ Facultative Reinsurance Business) and Agents' Balances ≤ 1 year; otherwise 100% risk charge applies;

   c. For Outstanding Premiums from Treaty Reinsurance Business ≤ 2 years; otherwise 100% risk charge applies;

   d. For deposits with a bank or deposit-taking institution:

     • that can be unconditionally withdrawn within 6 months, apply a factor of 50% to **Table 1**

     • otherwise as per **Table 1**

   e. For all other counterparty exposures, **Table 1**.

  iii. Repeat the same calculation for all counterparties, and take the aggregate as the resulting total counterparty default risk requirement.

Table 1:

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

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[18] The ratings illustrated in this table make reference to S&P's credit ratings. Insurers can also use equivalent ratings from Moody's Investor Services, Fitch Inc and AM Best Company to derive the appropriate default risk charge. 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.

	Additional Notes:
	Note 21: Unrated counterparties are to be treated as having a rating of of between "BB- to BB+" and "BBB- to BBB+"; a default risk charge of 7.75% will apply.
	Note 22: Ageing of outstanding premium for annual and multi-year policies of direct life and general insurance business starts from **billable date** (excludes the effects of the delays by the insurer in policy issuance and billing)
	Note 23: Ageing of outstanding premiums for reinsurance business starts from **accrual date** for reinsurers.
	Note 24: Please refer to **Appendix 6** for the treatment of guarantees and collaterals.

4.10   The formula to derive the diversified C2 requirements is as follows:

$$C2 = \sqrt{C2_{market}^2 + C2_{default}^2 + 2 \times Corr_{m,d} \times C2_{market} \times C2_{default}}$$

where

$Corr_{m,d}$= 0.5

$C2_{market}$ = Market-related C2 requirements (described below)

$C2_{default}$= C2 Counterparty Default risk requirement

4.11   Market-related C2 requirements will consist of the following:

- Equity investment risk requirement

- Interest rate mismatch risk requirement

- Credit spread risk requirement

- Property investment risk

- Foreign currency mismatch risk requirement

4.12   Market-related C2 requirements will be derived as follow:

$$C2_{market} = \sqrt{\sum Corr_{i,j} \times Market_i \times Market_j}$$

where

$Corr_{i,i}$= the correlation parameter for market risk sub-modules i and j

Market$_i$, Market$_j$= Risk requirements for market risk sub-modules i and j respectively.

- Where interest rate mismatch risk requirement is determined using the <u>upward interest rate scenario</u>, Corr$_{i,i}$ is equal to the value set out in row i and in column j of the following correlation matrix:

	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

- Where interest rate mismatch risk requirement is determined using the <u>downward interest rate</u> scenario, Corr$_{i,i}$ is equal to the value set out in row i and in column j of the following correlation matrix:

	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

Ageing of Outstanding Premium

4.13   For the purpose of QIS 2, where computing the counterparty default risk requirements for outstanding premium, insurers are to use billable[19] date as the start date for ageing of outstanding premium for annual and multi-year policies of direct life and general insurance business.

4.14   "Billable date" refers to the date which part or all of each premium can first be billed without taking into consideration any credit period given. For example, in the case of an

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[19] Billable date excludes the effects of the delays by the insurer in policy issuance and billing

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.

4.15   For avoidance of doubt, there is no change to the current approach of ageing of outstanding premium for reinsurance business. (i.e. ageing starts from accrual date for reinsurance business)

4.16   Insurers are required to provide information on outstanding premium based on the above definitions under the tab "OPrem Info" in the Workbook.

C3 Requirements

4.17   For the purpose of QIS 2, C3 requirements would instead be treated as a deduction from the FR i.e. the asset holdings which exceed the prescribed concentration limits (as set out in Table 14 of the Sixth Schedule in Insurance (Valuation and Capital) Regulations 2004) to be deducted from the FR. The assets that are deducted from FR will not be subject to risk requirements.

4.18   In Form C, insurers can determine the concentrated assets above the prescribed concentration limits based on the alternative "adjusted" fund levels, as described in Section 2 of this document.

4.19   For avoidance of doubt, the OIF of licensed reinsurance branches and locally incorporated reinsurers that are not headquartered in Singapore, will not be subject to this treatment of concentrated assets.

Operational Risk Requirement

4.20   The operational risk requirement to be computed for each fund as the higher of:

a)   4% of GP_1 + Max(0, 4% x ((GP_1 - GP_0) - 20% x GP_0))

b)   0.5% of Gross (of reinsurance) policy liabilities

GP_1: Gross written premium income[20] for the 12 months preceding the valuation date (without deducting premium ceded to reinsurance). For example, for valuation date as of 31 December 2015, this item is for the year from 1 January 2015 to 31 December 2015.

GP_0: Gross written premium income for the 12 months preceding GP_1. For example, for valuation date as of 31 December 2015, this item is for the year from 1 January 2014 to 31 December 2014

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[20] For life business, this will be the Gross Premium figure taken from Form 2 of the statutory returns.

Gross (of reinsurance) policy liabilities: For Participating fund, this refers to the MCL.

4.21   The total operational risk requirement for each fund will be subject to an overall cap of 10% of the TRR (after diversification benefit and excluding operational risk requirement) of the same fund for the insurer. Insurer is to report the lower of the operational risk requirement based on the above formula or 10% of TRR of the same fund for the purpose of QIS 2.

4.22   Insurers are required to provide information used to derive the operational risk requirement under the tab "Ops risk info" in the Workbook.

Diversification benefit between asset and insurance risks

4.23   Diversification benefit is recognised between asset and insurance risks. The diversified C1 and C2 requirements is to be calculated as follows:

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

where C1 is the C1 requirements for both life and general business

and C2 is the C2 requirements

4.24   The diversified C1 and C2 requirements will be reported in Forms B and C of the Workbook based on above formula. Please note that the calculations for this item have already been built into the Workbook.

4.25   The TRR will then be the sum of the diversified C1 and C2 requirements (as computed above) and the operational risk requirement.

5.   COMPONENTS OF AVAILABLE CAPITAL

5.1   This section specifies the composition of FR and **is applicable for all QIS bases**. Unless otherwise specified in this document, the insurer should refer to the requirements set out in Insurance (Valuation and Capital) Regulations 2004.

5.2   The total FR of the insurer are made up of:

   a)   Tier 1 Capital;

   b)   Tier 2 Capital; and

   c)   Regulatory adjustments

5.3   Tier 1 Capital and Tier 2 Capital comprises the following:

Tier	Components
Tier 1 Capital	*Sum of*
	(a) Aggregate of surpluses of all insurance funds other than a participating fund;
	(b) Balances in the surplus account of each participating fund;
	(c) Where it is a licensed insurer incorporated in Singapore, the *sum of*:
	i. Paid-up ordinary share capital;
	ii. Surpluses of overseas branch operations;
	iii. Retained earnings;
	iv. Additional Tier 1 ("AT1") Capital, which will be the sum of the capital instruments issued by the insurer that comply with the requirements in **Appendix 9**.
	Less
	Reinsurance adjustment
	Less
	Financial resource adjustment, comprising: • Loans to, guarantees granted for, and other unsecured amounts owed to the insurer • Charged assets

	• Deferred tax assets • Intangible assets • Other financial resource adjustments
	Less
	Adjustment for asset concentration (formerly C3 requirements)
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 **Appendix 10**.

5.4   For a licensed insurer incorporated in Singapore, Common Equity Tier 1 ("CET1") Capital will be taken to mean Tier 1 Capital less AT1 Capital.

5.5   A licensed insurer must ensure that at all times[21]:

a)   the CET1 Capital of the insurer is not less than *60%[22]* of sum of total risk requirements (excluding the risk requirements of participating funds) of the insurer; and

b)   the Tier 1 Capital of the insurer is not less than *80%* of the sum of total risk requirements (excluding the risk requirements of participating funds) of the insurer.

5.6   An insurer intending to issue or recognise any AT1 capital instrument or Tier 2 Capital instrument for the purpose of inclusion as AT1 Capital or as Tier 2 Capital respectively should comply with the submission requirements stated in **Appendix 11**.

5.7   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).

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[21] The following floors will replace the existing Tier 1 and Tier 2 limits under the current RBC framework.

[22] For the avoidance of doubt, this specific floor is only applicable for licensed insurers incorporated in Singapore.

Reinsurance Adjustment

5.8   The reinsurance adjustment will be calculated as:

A x B, 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 counterparty default risk factor which depends on the credit rating of the reinsurer

5.9   For the purpose of QIS 2, insurers should assume that the following proposals relating to the computation of reinsurance adjustment will be effected immediately so that the impact can be assessed:

a)   To remove the recognition of the reinsurance arrangement between a Head Office and its branch in Singapore. This means there should not be any reinsurance reduction (when valuing the insurers' liabilities) and no reinsurance adjustment resulting from these arrangements between branch and Head Office[23];

b)   To continue to recognise reinsurance arrangement between an insurer and its downstream entities[24,] subject to safeguards such as collaterals and letter of credit for the benefit of ceding insurer being in place before recognition can be given. Insurers will need to provide such description of safeguards and feasibility in the Questionnaire;

c)   To include claims liabilities (including RBNS and IBNR) in the reinsurer's share of the liabilities for general business for the calculation of the Reinsurance Adjustment;

d)   To recognise the use of letter of credit in reducing the Reinsurance Adjustment, when the criteria specified in **Appendix 8** is met. A

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[23] This is notwithstanding that 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 (paragraph 6.56 of the main consultation paper).

[24] This includes a Singapore subsidiary reinsuring with its subsidiary, or a Singapore branch reinsuring with a subsidiary of its Head Office. For avoidance of doubt, the definition of downstream entities **will not include** examples where a Singapore subsidiary reinsures to another subsidiary of the parent company or another subsidiary within the group, nor where a Singapore subsidiary reinsures to a branch of the parent company or another branch within the group (as mentioned in 6.62 to 6.65 of the main consultation paper).

corresponding counterparty default risk charge will need to be set up under the Counterparty Default Risk Requirement to account for the counterparty risk exposure to the seller of the letter of credit.

5.10   As mentioned in paragraph 6.57 in the main consultation paper, MAS proposes to continue recognising 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. This is subject to the following safeguards:

a)   where reinsurance recoverables have already been paid from third party reinsurers, pending distribution from the Head Office, the amount would be subject to the 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, 100% risk charge will be levied (see paragraph 6.60 of main consultation paper);

b)   where Singapore branch does not have a legal right to receive the recoveries directly from the third party reinsurers or is not a named party to the contract, Head Office will be asked to provide a written confirmation (e.g. letter of comfort) to MAS 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 recoverables to the branch will be determined (see paragraph 6.61 of main consultation paper).

5.11   When calculating the reinsurance adjustment, apply the same counterparty default factors as in **Table 1** on the reinsurance reduction[25] from the various reinsurance counterparties:

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

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[25] The reinsurance reduction:

(a) in the case of the life business of the insurer, is equal to the reduction in the value of the liabilities of the insurer in respect of its participating policies, non-participating policies and investment-linked policies due to reinsurance ceded to that reinsurance counterparty, excluding any special risk ceded by way of reinsurance; or

(b) in the case of the general business of the insurer, is equal to the reduction in premium liabilities and claim liabilities of the insurer in respect of its general business due to reinsurance ceded to that reinsurance counterparty, excluding any special risk ceded by way of reinsurance

From BB- to BB+	10.5
From B- to B+	20.0
CCC+ and below	48.5

5.12   The same calculation is then repeated for all reinsurance counterparties, and the total reinsurance adjustment for the fund is the aggregate sum of all the corresponding reinsurance adjustments.

5.13   For counterparties that are unrated, a default risk charge of 7.75% will apply.

Example:

Total Reinsurance Reduction = 100,000

Reinsurance Counterparty	(1) Reinsurance Reduction	(2) Counterparty credit rating	(3) Counterparty Default Risk Charge	Reinsurance Adjustment Columns (1) x (3)
Counterparty A	55,000	AA	1.0%	550
Counterparty B	35,000	BBB	5.0%	1,750
Counterparty C	10,000	Unrated	7.75%	775
Total				3,075

The resulting total reinsurance adjustment is therefore 3,075.

Insurers are also required to provide impact analysis for the proposals mentioned above respectively in the Workbook under the tab "Rein Info".

Regulatory Adjustment

Allowances for provisions for non-guaranteed benefits ("APNGB")

5.14   APNGB of a participating fund shall be calculated as set out in the Insurance (Valuation and Capital) Regulations 2004, except that the "50% of the aggregate present value of non-guaranteed benefits and PAD" limit is removed. For avoidance of doubt, the limit of Policy Assets less MCL still remains.

5.15   Please note that the concept of adjusted and non-adjusted capital ratio still applies when determining the amount of APNGB to be adjusted.

Negative Reserves

5.16   Insurers should not value the liability in respect of any policy to be less than zero, unless there are monies due to the insurer when the policy is terminated on valuation date (e.g. surrender penalty), in which event the value of the liability in respect of that policy may be negative to the extent of the amount due to the insurer.

5.17   The existing treatment of having negative reserves off balance sheet will remain but part of the negative reserves can be recognised as a form of positive regulatory adjustment to FR at both the fund and company level. The portion of the negative reserves that are recognised within policy liabilities (i.e. the monies due to the insurer when policy is terminated as mentioned above) should not be considered again for purpose of regulatory adjustment, else there would be double recognition.

5.18   To determine the amount of negative reserves to be recognised, the insurer will need to apply all insurance shocks prescribed under the proposed RBC 2 C1 requirements, in the same manner as if it is determining the C1 requirements, and applying the same correlation matrix (set out in paragraph 4.4), to derive the after-shock negative reserves. This amount is then added on as a regulatory adjustment to each fund respectively. For clarity, please refer to the example in the Workbook in tab "Example on NR and C1". For avoidance of doubt negative reserves should be determined based on the MCL for UL policies. There will be no application of further haircuts, but as mentioned in paragraph 6.44 of the main consultation paper, MAS reserves the right to re-introduce the haircuts if there is no convergence on a consistent valuation methodology for the valuation of long-term health and investment-linked (non-unit reserves) policies.

Appendix 1

TYPES OF RISK REQUIREMENTS AND DESCRIPTIONS OF RISKS

Organisation of the Risk Modules under RBC 2

Surrender Value Condition may be removed if mass lapse event is considered within the calibration of Lapse risk requirement
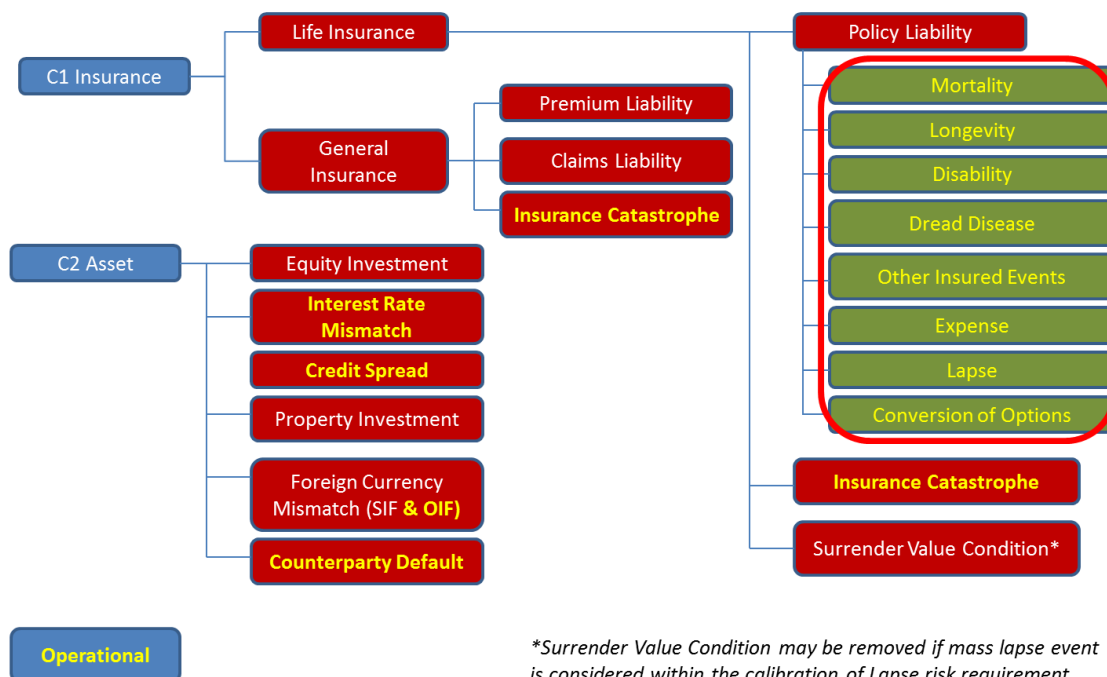
Type of risk requirements	Description of risk
Mortality risk	Mortality risk is the risk associated with the variability in liability cash flows due to the incidence of death.
Longevity risk	Longevity risk is the risk associated with the variability in liability cash flows due to increasing life expectancy.
Disability risk	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.
Dread disease risk	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.
Other insured events (A&H) risk	Other insured events (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.
Expense risk	Expense risk is the risk associated with the variability in liability cash flows due to the incidence of expenses

	incurred.
Lapse risk	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.
Conversion of options risk	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).
Life insurance catastrophe risk	Life insurance catastrophe risk stems from extreme or irregular events which effects are not sufficiently captured in the other C1 requirements.
Surrender value condition risk	Surrender value condition risk is the risk associated with the aggregate value of the surrender values of the policies in the fund is more than the policy liabilities and total risk requirements of the fund.
Premium liability risk	Premium liability risk is associated with future claims and is the risk that the amount set aside for claims and expenses against unearned premiums will prove inadequate.
Claims liability risk	Claims liability risk is associated with incurred claims, i.e. existing claims, and is the risk that the amount set aside for claims that have already occurred will prove inadequate.
General insurance catastrophe risk	General insurance catastrophe risk stems from extreme or irregular events which effects are not sufficiently captured in requirements for premium liability risk and claim liability risk.
Equity investment risk	Equity investment risk is the risk of economic loss due to changes in the price of equity exposures.
Interest rate mismatch risk	Interest rate mismatch risk is the risk arising from changes in market interest rates, which 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 the relevant yield curve.
Credit spread risk	Credit spread risk is the risk of change in value due to movements in the market price of credit risk.
Property investment risk	Property risk is the risk of economic loss due to changes in the price of property exposures.
Foreign currency mismatch risk	Foreign currency mismatch risk is the risk of economic loss due to adverse movements in the value of foreign currencies against the Singapore dollar.

Counterparty default risk	Counterparty default risk is the risk of economic loss due to unexpected default of the counterparties and debtors of insurers.
Operational risk	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).

Appendix 2

LIST OF COUNTRIES IN MSCI WORLD EQUITY INDEX

MSCI - Developed Countries

Australia

Austria

Belgium

Canada

Denmark

Finland

France

Germany

Hong Kong SAR

Ireland

Israel

Italy

Japan

Netherlands

New Zealand

Norway

Portugal

Singapore

Spain

Sweden

Switzerland

United Kingdom

United States

Appendix 3

TREATMENT OF COLLECTIVE INVESTMENT SCHEMES

Instructions and Clarifications

1. For Collective Investment Schemes ("CIS"), the insurer may calculate the asset risk charge by looking-through to the underlying securities held by the CIS and treating the asset holdings as separate and distinct investments. Each of these assets should then be subject to the relevant C2 risk module.

2. For CIS which invests a portion or entirely in debt securities or debt derivatives, the insurer can treat the underlying debt securities which are of the same currency as a single debt security and calculate the risk charges based on the relevant risk modules by assuming the average maturity, coupon and credit quality of the debt securities or debt derivatives.

3. Insurers will also be allowed to allocate the underlying exposures in reference to the investment mandate of the scheme. But in doing so, the allocation must be done in such a manner as to produce the maximum overall capital requirement, i.e. in that it invests, to the maximum extent allowed, in the asset class that attracts the highest risk requirement, and then continues making investments in descending order until the maximum total investment level is reached. An example has been included later to illustrate this.

4. In cases where the insurer chooses not to adopt the look-through approach, either based on the actual allocation of the underlying exposures or the investment mandate, the insurer can apply a 50% risk charge to the market value of the CIS.

5. Where a look-through approach is taken, the insurer must provide and maintain sufficient evidence to demonstrate that the proposed allocation of the investment exposure of the CIS into the relevant risk charge modules is justifiable and reasonable.

6. Insurers should consult MAS should there be any uncertainty on the risk requirement treatment for its CIS holdings.

7. As mentioned in the main consultation paper, MAS will be proposing an approach to overcome the potential operational challenges of a look-through approach. MAS also seeks views on alternative suggestions (Question 24 of main consultation paper).

Example illustrating how insurers should make reference to the investment mandate of the CIS when deriving a suitable risk charge

A CIS has a mandate that states that it invests 20-30% in listed Singapore equities and 70-80% in equities listed in Other Markets. For risk charging purposes, since equities that are listed in "Other markets" attract a higher risk charge,it should be assumed that the CIS invests 20% in listed Singapore equities and 80% in equities listed in Other Markets in order to produce the maximum overall capital requirement for the CIS.

The resulting risk charge for the entire CIS is therefore (20% x 40%) + (80% x 50%) = 48%

<div align="right">**Appendix 4**</div>

CALCULATION OF INTEREST RATE MISMATCH AND

CREDIT SPREAD RISK REQUIREMENTS

<u>Instructions and Clarifications</u>

1. The government yield curves derived by insurers must be based on market observable yields. Insurers can refer to paragraph 4.2.4 of the SAS Guidance Note ("GN") L02 for various approaches that can be taken to determine the market yield of government curves.[26]

2. Insurers should then adjust the relevant yield curve[27] relevant to the interest rate exposure by adding to the relevant yield curve, the absolute amounts of the calculated upward and downward interest rate adjustments, to revalue the assets and liabilities under the upward and downward scenarios respectively.

3. For interest rate sensitive assets, where the market value of exposures in a particular currency is immaterial (less than 5% of the total market value of all interest rate sensitive assets), the insurer may use the US Government yield curve as a proxy of the actual government yield curve, as well as, to determine the interest rate adjustments for exposures in that currency

4. Floating rate instruments are to assume a term until the next coupon reset date.

5. For bonds with optionality (e.g. callable bonds), to determine the duration:

    o   Under upward interest rate up scenario, use term to final maturity

    o   Under downward interest rate scenario, use term to first call date

    The "after-shock" market price of the callable bond should not exceed the present value of [call price + all cash flows payable before and on the first call date].

6. For credit spread adjustments, insurers should similarly revalue the exposures by adding the constant spread adjustment (determined based on the remaining term and credit rating of that security) to the relevant yield curve of the security.

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[26] We note that this GN is for the valuation of policy liabilities for life business and paragraph 4.2.4 provides guidance for determination of SGS market yields specifically. However, the approaches proposed can also be used to determine the market yield of other government curves, and thus can be used for the purposes of interest rate and credit spread risk charging as detailed under this appendix.

[27] For policy liabilities and risk-free assets (government securities), the relevant yield curve is the corresponding government yield curve. For other assets, insurers should calculate a single spread over the relevant government yield curve that equates the discounted present value of cash flows to the market value of the asset. Insurers should then assume that the relevant base yield curve for these assets is the sum of the government yield curve plus the constant spread.

Sample calculations of interest rate mismatch and credit spread risk requirements for asset exposures

Example 1 – Government Bond

USD Government Bond				
Credit Rating	AA			
Remaining Term:	3 years			
Coupon per 100:	2			
Redemption:	100			
Market Price:	100			

1) Identify the relevant government yield curve for the corporate bond.
The relevant government yield curve is the United States Government Securities yield curve.

2) Derive the relevant yield curve for the corporate bond.

Time, t	Cash Flows	US Gov Yield (Illustrative rates only)	Present Value Factor	Present Value ("PV") of Cash Flows using SGS yield
0	-	-		
1	2	1.00%	0.9901	1.98
2	2	1.20%	0.9764	1.95
3	102	2.00%	0.9423	96.12
				100.05

> For government bonds, we accept that discounting the cash flows by the observed government yield curve may not result in the observed market value. However, we do not expect the difference to be significant.
> Hence, for these bonds, insurers can perform the calculation for interest rate mismatch and credit spread risk (if applicable) by taking the change in value as the change in theoretical price, rather than the exact market value of the security.

For interest rate mismatch risk calculation - Compute the change in value of the corporate bond under the upward and downward scenarios

1) Derive absolute interest rate adjustments for the interest rate mismatch risk requirement calculation.
Do note that if the resulting calculated absolute adjustment exceeds 200 basis points, then the adjustment will be capped at 200 bps.

> The absolute adjustments are derived by multiplying the government yield curve relevant to the corporate bond, by the relevant prescribed % adjustments.

Time, t	US Gov Yield (Illustrative rates only)		% Upward Adjustment	Absolute Upward Adjustment = US Gov Yield * % Upward Adjustment	% Downward Adjustment	Absolute Downward Adjustment = US Gov Yield * % Downward Adjustment
0	-		-			
1	1.00%		100%	1.00%	-70%	-0.70%
2	1.20%		100%	1.20%	-70%	-0.84%
3	2.00%		95%	1.90%	-65%	-1.30%

> Resulting absolute adjustment will be capped at 200 bps.

2) Compute the change in value of the corporate bond under the upward and downward scenarios.

Time, t	Cash Flows	Relevant Yield (+) Absolute Upward Adjustment	Present Value Factor	PV of Cash Flows using Relevant Yield (+) Absolute Upward	Relevant Yield (+) Absolute Downward Adjustment	Present Value Factor	PV of Cash Flows using Relevant Yield (+) Absolute Downward
0	-	-			-		
1	2	2.00%	0.9804	1.96	0.30%	0.9970	1.99
2	2	2.40%	0.9537	1.91	0.36%	0.9928	1.99
3	102	3.90%	0.8916	90.94	0.70%	0.9793	99.89
				94.81			103.87
	Reduction in bond value (upward scenario):			**5.24**	**(downward scenario):**		**-3.82**

For Credit Spread risk calculation - Compute the change in value of the corporate bond
Since the US government bond has a sovereign rating of AA, which is higher than A-, the credit spread risk module is not applicable.

Example 2 – Corporate Bond

Interest rate mismatch risk requirement

SGD Corporate Bond							
Credit Rating	AA						
Remaining Term:	5 years						
Coupon per 100:	4						
Redemption:	100						
Market Price:	105						

1) Identify the relevant government yield curve for the corporate bond.

Since the currency of this corporate bond is SGD, the relevant government yield curve is the Singapore Government Securities ("SGS") yield curve.

2) Derive the relevant yield curve for the corporate bond.

> Calculate single spread over the SGS that equates the discounted present value of the cash-flows to the market value of the corporate bond.

0.99%

Time, t	Cash Flows	SGS Yield (Illustrative rates only)	Present Value Factor	Present Value ("PV") of Cash Flows using SGS yield	Relevant Yield Curve = SGS (+) constant spread	Present Value Factor	PV of Cash Flows using SGS yield (+) constant spread
0	-	-			-		
1	4	0.30%	0.9970	3.99	1.29%	0.9873	3.95
2	4	0.50%	0.9901	3.96	1.49%	0.9709	3.88
3	4	1.00%	0.9706	3.88	1.99%	0.9427	3.77
4	4	1.50%	0.9422	3.77	2.49%	0.9064	3.63
5	104	2.00%	0.9057	94.20	2.99%	0.8632	89.77
				109.80			105.00

For interest rate mismatch risk calculation - Compute the change in value of the corporate bond under the upward and downward scenarios

1) Derive absolute interest rate adjustments for the interest rate mismatch risk requirement calculation.

Do note that if the resulting calculated absolute adjustment exceeds 200 basis points, then the adjustment will be capped at 200 bps.

> The absolute adjustments are derived by multiplying the government yield curve relevant to the corporate bond, by the relevant prescribed % adjustments.

Time, t	SGS Yield (Illustrative rates only)		% Upward Adjustment	Absolute Upward Adjustment = SGS * % Upward Adjustment	% Downward Adjustment	Absolute Downward Adjustment = SGS * % Downward Adjustment	
0	-		-				
1	0.30%		100%	0.30%	-70%	-0.21%	
2	0.50%		100%	0.50%	-70%	-0.35%	
3	1.00%		95%	0.95%	-65%	-0.65%	
4	1.50%		95%	1.43%	-65%	-0.98%	
5	2.00%		90%	1.80%	-60%	-1.20%	

2) Compute the change in value of the corporate bond under the upward and downward scenarios.

Time, t	Cash Flows	Relevant Yield (+) Absolute Upward Adjustment	Present Value Factor	PV of Cash Flows using Relevant Yield (+) Absolute Upward Adjustment	Relevant Yield (+) Absolute Downward Adjustment	Present Value Factor	PV of Cash Flows using Relevant Yield (+) Absolute Downward Adjustment
0	-	-			-		
1	4	1.59%	0.9844	3.94	1.08%	0.9894	3.96
2	4	1.99%	0.9614	3.85	1.14%	0.9777	3.91
3	4	2.94%	0.9168	3.67	1.34%	0.9610	3.84
4	4	3.91%	0.8577	3.43	1.51%	0.9418	3.77
5	104	4.79%	0.7915	82.32	1.79%	0.9153	95.19
				97.20			110.67
	Reduction in bond value (upward scenario):			7.80	(downward scenario):		-5.67

Credit spread risk requirement

SGD Corporate Bond		
Credit Rating	AA	
Remaining Term:	5 years	
Coupon per 100:	4	
Redemption:	100	
Market Price:	105	

For Credit Spread risk calculation - Compute the change in value of the corporate bond

1) Identify the relevant constant basis point credit spread adjustment for the corporate bond.

Term\Credit Ratin	AAA	From AA- to AA+	From A- to A+	From BBB- to BBB+	From BB- to BB+	B+ and below	The applicable credit spread adjustment based on term and credit rating of the corporate bond
0-5	105	120	165	245	405	540	
5-10	95	115	145	230	365	500	
>10	90	95	125	215	355	475	

2) Calculate the change in value of the corporate bond by adding this constant credit spread adjustment on the relevant yield curve for the bond

Time, t	Cash Flows	Relevant Yield (+) credit spread adjustment	Present Value Factor	PV of Cash Flows using Relevant Yield (+) credit spread adjustment
0	-	-		
1	4	2.49%	0.9757	3.90
2	4	2.69%	0.9484	3.79
3	4	3.19%	0.9102	3.64
4	4	3.69%	0.8652	3.46
5	104	4.19%	0.8146	84.72
				99.52
Reduction in bond value from credit spread adjustment:				**5.48**

Example 3 – Using Modified Duration Approach

SGD Corporate Bond						
Credit Rating	AA					
Remaining Term:	5 years					
Coupon per 100:	4					
Redemption:	100					
Market Price:	105					
Coupon frequency	Annual					

1) Get the yield to maturity (YTM)

YTM	**2.91%**

2) Compute the modified duration

Modified Duration	**4.51**

For interest rate mismatch risk calculations - Compute the change in value of the corporate bond under the upward and downward scenarios

1) Derive absolute interest rate adjustments for the interest rate mismatch risk requirement calculations

Do note that if the resulting calculated absolute adjustment exceeds 200 basis points, then the adjustment will be capped at 200 bps.

Time, t	SGS Yield (Illustrative rates only)	% Upward Adjustment	Absolute Upward Adjustment = SGS * % Upward Adjustment		% Downward Adjustment	Absolute Downward Adjustment = SGS * % Downward Adjustment
4	1.40%	95%	1.33%		-65%	-0.91%
5	2.00%	90%	1.80%		-60%	-1.20%

2) Compute the change in value of the corporate bond under the upward and downward scenario

		Upward	Downward	
	Reduction in bond value	8.52	-5.41	Where modified duration is in between duration specified in the prescribed table, to apply the adjustments corresponding to the closest term. i.e. 5 in this case.

For Credit Spread risk calculations - Compute the change in value of the corporate bond

1) Identify the relevant constant basis point credit spread adjustment for the corporate bond.

Term\Credit Rating	*AAA*	*From AA- to AA+*	*From A- to A+*	*From BBB- to BBB+*	*From BB- to BB+*	*B+ and below*
0-5	105	**120**	165	245	405	540
5-10	95	115	145	230	365	500
>10	90	95	125	215	355	475

2) Calculate the change in value of the corporate bond using modified duration

	Reduction in bond value	5.68

RECOGNITION OF DIVERSIFICATION BETWEEN INSURANCE FUNDS

FOR INTEREST RATE MISMATCH RISK

Instructions and Clarifications

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

2. However, at company level, we can allow diversification between some funds to be recognised. This applies to all funds excluding the Participating ("Par") fund.

3. For the calculation of this diversification benefit, there needs to be first a determination of a "dominant scenario" for the company as a whole, this scenario being either the upward or downward scenario which results in the maximum aggregated loss across all funds (excluding Par fund).

4. The result of such an approach may result in a reduction of required risk capital for interest rate mismatch risk requirement; if for example, a fund faces losses under say an increasing interest rate scenario while another fund faces losses under a decreasing interest rate scenario.

5. The mechanism for this approach has been built in into the Workbook, so there is no additional calculations that need to be done by the insurer.

TREATMENT OF GUARANTEES AND COLLATERAL

1. Where the insurer holds eligible collateral against an asset or the asset has been guaranteed, the insurer may recognise the effects of these risk mitigants and risk requirements may be reduced accordingly.

Collateral

2. Eligible collateral held against an asset may be considered in place of the asset. Where the risk-adjusted value of the collateral does not fully cover the full value of the asset, only the covered portion can be replaced.

3. The risk-adjusted value of eligible collateral shall be determined as follows:

   a. in the case of cash and deposits 100% of the value;
   b. in the case of a security issued by a government or a public authority, 95% of the current market value of the security; and
   c. in the case of a security listed on a securities exchange, 70% of the current market value of the security.

Example

Risk adjusted value of collateral in form of cash = $500

Value of asset = $600

The insurer would need to compute counterparty default risk requirement on the cash collateral. The remaining $100 of the asset shall be risk-charged accordingly.

Guarantees

4. Insurers are only allowed to take credit for guarantees, provided that the guarantees are

   • Direct;
   • Explicit;
   • Irrevocable;
   • Unconditional; and
   • Legally enforceable for the remaining term to maturity of the asset.

5. Insurer may use the credit rating of the credit rating of the third party guarantor when determining the stresses to be applied to the asset under credit spread risk sub-module and counterparty default risk sub-module.

6. Where the guarantee does not cover the full value of the asset, the risk requirements on the unprotected portion shall be determined using the credit rating of the original counterparty.

TREATMENT OF STRUCTURED PRODUCTS AND DERIVATIVES

Instructions and Clarifications

1. 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. This typically takes the form of a tranche 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.

2. 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.

3. In addition, as structured product can be decomposed into different equivalent bundles of cash and derivative holdings, in calculating the market-related risk requirements, the insurers could either:

   a)   Adopt look-through approach and applying the relevant risk module. One common risk associated with structured products is a relative lack of liquidity due to the highly customized nature of the investment. To account for volatility and illiquidity risk of structured product, we propose to then apply a 50% premium on the derived market risk requirement; or

   b)   Apply a fixed 50% risk charge on the entire marked-to-market value of the investment.

4. MAS will work together with the industry on assessing treatment of derivatives, especially in light of the recent developments in Basel III as mentioned in the main consultation paper. For the purpose of QIS 2, the following interim approach is to be taken for derivatives:

   a)   An insurer should calculate its market risk capital requirement by:

      i.   identifying the options and the associated underlying financial instruments or commodities;

      ii. calculating the market risk capital requirement for each combination of a long put and a long outright position in the associated underlying financial instrument or commodity, or of a long call and a short outright position in the associated underlying financial instrument or commodity, by –

1.   multiplying the market value of the outright position by the sum of the applicable risk charges; and

2.   subtracting the amount the option is in the money (if any) bounded at zero.

b)   The above approach can be taken only if the insurer (i) does not write options or (ii) where it writes options, all its written options are hedged by perfectly matched long positions in exactly the same options.

c)   Insurers are expected to provide and maintain sufficient evidence to demonstrate that the proposed allocation of the market risk exposure of the Structured Product into the relevant risk charge modules is justifiable and reasonable.

d)   Insurers should consult MAS should there be any uncertainty on the capital treatment for its structured products.

Examples of derivatives risk requirements[28]:

For clarity, the counterparty default risk requirement will still apply for all derivatives.

i.   <u>Equity Derivatives</u>

An insurer should convert its equity derivative instruments into notional positions in the relevant underlying equity instruments and use the current market value of the underlying instruments to calculate its market risk capital requirement for equity position risk.

Examples of equity derivatives and treatment:

- **Convertibles**: To be treated as notional position in the equity to which it converts, and

    o add any loss if insurer converts to equity or

    o deduct any profits if insurer converts to equity.

- **Futures, Forwards on a Single Equity**: To be treated as notional position in that equity.

- **Equity Options:**

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[28] Aligned to the Simplified Approach method under MAS637

1.   For combination of long put and long outright position in underlying instruments,

Risk requirement = Market value of the outright multiplied by equity risk charge less the amount that the option is in-the-money

2.   For combinations of long call or long put,

Risk requirement = Market value of underlying instruments multiplied by equity risk charge, or market value of option, whichever is lower

- **Equity swaps**: Where the insurer is receiving amount based on change in value of a single equity or equity index, and paying amount based on change in value of another equity or equity index, as notional long position in the former and a notional short position in the latter.

ii.   Interest Rate Derivatives

An insurer should convert its interest rate-related derivatives into notional positions in the relevant underlying instruments, and use the current market value of the principal amount of the underlying instruments to calculate its interest rate mismatch risk requirement.

An insurer should convert its credit derivatives into notional positions in the relevant reference obligations, and use the current market value of the principal amount of the reference obligations to calculate its interest rate mismatch risk requirement.

- **Interest Rate Swap**

If insurer receives fixed and pays floating this will be treated as:

1.   notional short position in a government debt with coupon equal to floating rate and maturity equal to next reset date, plus

2.   notional long position in government debt with coupon equal to fixed rate of swap and maturity equal to maturity of swap.

iii.   Credit Derivatives

Credit derivatives which are part of the insurer's risk mitigation policy should not be subject to a capital requirement for spread risk, as long as the insurer holds either

o the instruments underlying the credit derivative, or

o another exposure with respect to which the basis risk between that exposure and the instruments underlying the credit derivative is not material[29] in any circumstances.

Otherwise, the capital treatment is founded on the substitution approach, whereby the protected portion of a counterparty exposure is assigned the capital charge of the guarantor or protection provider, while the uncovered portion retains capital charge of the insurer.

iv. Foreign Currency Derivatives

Foreign exchange forwards/futures contract: An insurer should treat a foreign exchange forward, futures contract as two notional currency positions:

(a) A long notional position in the currency which the insurer has contracted to buy; and

(b) A short notional position in the currency which the insurer has contracted to sell,

Where each notional position has a value equal to the present value of the amount of each currency to be exchanged in the case of a forward or futures contract.

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[29] Basis risk of less than 10%

Appendix 8

REQUIREMENTS FOR RECOGNITION OF LETTER OF CREDIT ("LC")

Eligible Issuers	An "eligible protection provider" means a guarantor or protection seller which is: (a) a central government, a central bank, the Bank for International Settlements, the International Monetary Fund, the European Central Bank or the European Community; (b) an MDB; (c) a PSE; (d) a banking institution; or (e) in the case where the credit protection is – (i) not provided for a securitisation exposure, any other entity with an external credit assessment by a recognised credit rating agency; or (ii) provided for a securitisation exposure, any other entity which has a Counterparty Risk Class A or B credit rating as set out in Table 17 of the Sixth Schedule of the Insurance (Valuation and Capital) Regulations 2004 at the time the credit protection was provided, and a Counterparty Risk Class C credit rating or better as set out in Table 17 of the Sixth Schedule of the Insurance (Valuation and Capital) Regulations 2004 during the period of recognition of the LC. *Note: The definition in (a), (b), (c) and (d) will follow those in MAS 637*
Recognition of LC	An insurer may recognise the use of an LC only if – (a) all documentation relating to the LC is binding on all relevant parties and legally enforceable in all relevant jurisdictions; (b) the insurer complies with the requirements and meets the guidelines set out in the Criteria for Recognition of Guarantees below, as applicable; and (c) the insurer complies with the public disclosure requirements in Notice 124

Use of Multiple Risk Mitigation Methods	The reduction in the reinsurance adjustment, where applicable, shall not exceed the notional amount of credit protection.
	Where an insurer uses multiple risk mitigation methods for a single exposure (e.g. the exposure is partially covered by both collateral and guarantee), the insurer shall sub-divide the exposure into portions covered by each risk mitigation method (e.g. portion covered by collateral, portion covered by the LC) and shall calculate the exposure amount of each portion separately. An insurer shall apply the same approach when recognising eligible credit protection by a single protection provider where the eligible credit protection has differing maturities.
Inadequate Compliance with MAS' Requirements	If MAS is not satisfied that the requirements in the section on Recognition of LC above has been complied with, or with the effectiveness of the LC in mitigating the credit risk exposure of the insurer, MAS may take certain actions, including disallowing the insurer from fully recognising the effects of the LC.
Criteria for Recognition of Guarantees	(a) The guarantee is an explicitly documented obligation assumed by the guarantor
	(b) The guarantee represents a direct claim on the guarantor
	(c) The guarantee is explicitly referenced to a specific coverage so that the extent of the credit protection cover is clearly defined and incontrovertible
	(d) Other than in the event of non-payment by the ceding insurer in respect of the guarantee if applicable, there is an irrevocable obligation on the part of the guarantor to pay out a pre-determined amount upon the occurrence of a credit event, as defined under the guarantee
	(e) The guarantee does not contain any clause, the fulfilment of which is outside the direct control of the ceding insurer, that
	(i) Would allow the guarantor to unilaterally cancel the guarantee;
	(ii) Would increase the effective cost of the guarantee as a result of deteriorating credit quality of the underlying exposure;
	(iii) Could prevent the guarantor from being obliged to pay out in a timely manner in the event that the underlying obligor fails

	to make any payment due (iv) could allow the maturity of the guarantee agreed ex-ante to be reduced ex-post by the guarantor (f) the ceding insurer is able in a timely manner to pursue the guarantor for any monies outstanding under the documentation governing the transaction on the default of, or non-payment by, the underlying obligor, and has the right to receive such payments from the guarantor without first having to take legal actions to pursue the obligor for payment (g) the guarantee covers all types of payments that the underlying obligor is expected to make under the documentation governing the transaction (h) the term of the guarantee should be at least one year (i) the guarantee is renewed at least 90 days prior to expiration, otherwise the guarantee shall no longer be recognised in the 90 days immediately prior to the expiration of the guarantee

MINIMUM REQUIREMENTS FOR AT1 CAPITAL INSTRUMENTS

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

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

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

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

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

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

(f) the principal is perpetual. In this regard, there shall be no maturity date, and there shall be no step-ups or other provisions that mandate or create an incentive for the insurer to redeem the capital instrument[30];

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

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

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

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

(g) the capital instrument is callable at the option of the insurer only after a minimum of five years from the issue date[31], 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[32]; and

   (iii) The insurer shall not exercise a call option unless -

      (A) The instrument is replaced by the insurer with capital of the same or better quality, and the replacement of this capital is done at conditions which are sustainable for the income capacity of the insurer[33]; or

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

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

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

   (i)   The insurer has full discretion at all times to cancel distributions or payments[34];

For 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.

[31] 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.

[32] 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).

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

[34] 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.

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

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

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

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

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

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

(m) where the instrument is classified as a liability under the Accounting Standards, it shall have principal loss absorption features[35] 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

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Furthermore, the cancellation of distributions or payments means that these payments are extinguished; it does not permit features that require the insurer to make distributions or payments in kind. For 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.

[35] 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).

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

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

In addition, the aggregate amount to be converted or written down[36] 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 (excluding participating funds) or, if this is not possible, the full principal value of the instruments;

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

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

(p) the instrument does not have any feature that hinders recapitalisation, such as provisions that require the issuer to compensate investors if a new instrument is issued at a lower price during a specified time frame[37];

(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;

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

[37] 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.

(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.

Appendix 10

MINIMUM REQUIREMENTS FOR TIER 2 CAPITAL INSTRUMENTS

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

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

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

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

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

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

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

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

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

Table 1: Amortisation Schedule for a Tier 2 capital instrument

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

(iii) there are no step-ups or other provisions that mandate or create an incentive for the insurer to redeem the capital instrument[30].

(g) the capital instrument is callable at the option of the insurer only after a minimum of five years from the issue date[38], 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[32, 39];

(iii) The insurer shall not exercise a call option unless -

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

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

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

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[38] 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.

[39] 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.

(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;

(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.

<div align="right">**Appendix 11**</div>

SUBMISSION REQUIREMENTS FOR AN INSURER INTENDING TO ISSUE OR RECOGNISE A CAPITAL INSTRUMENT AS AT1 OR TIER 2 CAPITAL

The insurer shall -

(a) consult MAS well in advance to allow adequate time for review if the capital instrument has additional features which are not explicitly addressed in **Appendix 9** for AT1 Capital, or **Appendix 10** for Tier 2 Capital; and

(b) submit the following documents to MAS before including such issuance as AT1 Capital or Tier 2 Capital:

(i) a declaration signed by the Chief Executive of the insurer confirming –

(A) that the insurer is responsible for complying with the requirements for inclusion of the issuance of the AT1 capital instrument as AT1 Capital, or the issuance of the Tier 2 capital instrument as Tier 2 Capital;

(B) that all the requirements for the inclusion of the issuance of the AT1 capital instrument or Tier 2 capital instrument set out *[in the relevant regulations/notices]* have been met;

(C) the expected date on which the issuance would be included as AT1 Capital or Tier 2 Capital; and

(D) that the insurer is aware that MAS may take such necessary action against the insurer, including requiring the exclusion of the issuance for inclusion as AT1 Capital or as Tier 2 Capital, if the issuance does not, or subsequently does not, comply with the requirements set out *[in the relevant regulations/notices]*;

(ii) all the executed agreements and offering documents governing the issuance of the AT1 capital instrument or Tier 2 capital instrument;

(iii) all external legal opinions obtained in respect of the issuance of the AT1 capital instrument or the Tier 2 capital instrument stating that the requirements in **Appendix 9** and **Appendix 10** (where applicable) have been met;

(iv) a memorandum of compliance stating how the issuance complies with each of the requirements set out in **Appendix 9** and **Appendix 10** (where applicable) and identifying the relevant portions of the agreements and offering documents governing the issuance of the AT1 capital instrument or Tier 2 capital instrument which address each requirement;

(v) where the agreements and offering documents governing the issuance of the AT1 capital instrument or Tier 2 capital instrument are governed by the laws of a

jurisdiction other than Singapore, a written external legal opinion from an advocate and solicitor qualified to practise Singapore law, that he has reviewed all the agreements and offering documents governing the issuance, including any legal opinion from foreign law practitioners provided pursuant to paragraph (iii) and the memorandum of compliance, and confirms that the memorandum of compliance read together with such agreements, offering documents, legal opinions and any letter of undertaking provided by the insurer or any insurance group entity address the requirements of **Appendix 9** or **Appendix 10**, as the case may be.

For the purpose of paragraph (iii), the written external legal opinion shall be reasonably unqualified, in particular with respect to the prohibition on provisions which mandate or create incentives for the redemption of the instrument, and other requirements relating to loss absorption, priority of claims, waiver of set-off amounts or benefits and subordination.