BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

Valuation of Insurance and Takaful Liabilities

Exposure Draft

Applicable to:
1. Licensed insurers
2. Licensed takaful operators
3. Professional reinsurers
4. Professional retakaful operators

Issued on: 24 December 2019 BNM/RH/ED 029-15

This exposure draft sets out the proposed requirements on the valuation of insurance and takaful liabilities. The enhancements to the valuation are developed with the aim of ensuring that the liabilities are valued in a way that is:

(a) adequately reflective of the underlying cash flow obligations of the insurance and takaful contracts; and
(b) consistent and comparable across different insurance and takaful products.

The Bank is undertaking a review of the overall solvency framework as part of its holistic review of the overall capital adequacy framework. In developing the exposure draft, the Bank has taken into consideration the developments in global regulatory and accounting standards.

The Bank invites written comments on this exposure draft, including suggestions for particular issues or areas to be clarified or elaborated further and any alternative proposals that the Bank should consider. To facilitate the Bank's assessment, please clearly notate to which paragraph each comment is related to, and support each comment with a clear rationale and accompanying evidence or illustration, as appropriate.

In addition to providing general feedback, licensed persons are requested to respond to the specific questions set out in this exposure draft.

Responses must be submitted electronically in the prescribed format and addressed to pfpconsult@bnm.gov.my by 15 April 2020.

Submissions received may be made public unless confidentiality is specifically requested for the whole or part of the submission.

In the course of preparing your feedback, you may direct any queries to the following officers at 03-26988044 –

(a) Chew Hwee Yin (ext 8732)
(b) Rajeswari Eliyathamby (ext 8533)
(c) Nur Nabila Zafirah Abdul Samat (ext 7285) for questions on templates

TABLE OF CONTENTS

PART A OVERVIEW 1
1 Introduction 1
2 Applicability 1
3 Legal provisions 2
4 Effective date 2
5 Interpretation 2
6 Related legal instruments and policy documents 3
7 Policy documents superseded 3
PART B GOVERNANCE 4
8 Roles of the board, senior management and appointed actuary 4
9 Data and information used for valuation 5
PART C MEASUREMENT OF LIABILITIES 7
10 General requirements 7
11 Recognition and derecognition of contracts 7
12 Boundary of a recognised contract 8
13 General requirements on central estimate liabilities 10
14 Specific requirements for life insurance and family takaful contracts 15
15 Specific requirements for general insurance and general takaful contracts 16
16 Specific requirements for takaful contracts 17
17 Specific requirements for inwards reinsurance and inwards retakaful contracts 19
18 Reinsurance and retakaful recoveries 20
19 Discount rate 21
20 Provision of risk margin for adverse deviation (PRAD) 32
PART D REPORTING 34
21 Reporting to the Bank 34
APPENDICES 36
Appendix I Guidance on assessment of contract boundary for common contracts 36
Appendix II Guidance on setting assumptions 39
Appendix III Guidance on inwards reinsurance and inwards retakaful 41
Appendix IV Parameters for non-ringgit denominated cash flows 43

PART A OVERVIEW

1. Introduction

1.1 The valuation of insurance and takaful liabilities forms the foundation for measurement of the capital adequacy of a licensed person, and as such should contribute towards the measurement being sufficiently risk sensitive, comparable and robust.

1.2 This policy document is developed to ensure that the insurance and takaful liabilities are calculated in a way that is:
(a) reflective of the underlying cash flow obligations of the insurance and takaful contracts; and
(b) consistent and comparable across different insurance and takaful products and different licensed persons.

1.3 This policy document sets out the following requirements in relation to the valuation of insurance and takaful liabilities:
(a) the roles and responsibilities of the board, senior management and the appointed actuary;
(b) internal governance and management of data;
(c) measurement of insurance and takaful liabilities; and
(d) reporting.

2. Applicability

2.1 This policy document is applicable to licensed persons as defined in paragraph 5.2.

2.2 The requirements in this policy document are applicable to businesses generated from:
(a) within Malaysia; and
(b) outside Malaysia, except if the Bank has approved otherwise.

2.3 In relation to paragraph 2.2(b), the Bank may consider granting an approval to exempt a branch of a foreign insurer or foreign takaful operator from the requirements in this policy document, if the following conditions are met:
(a) there is explicit undertaking from the branch's head office to satisfy the liabilities arising from businesses outside Malaysia in the event that the branch is unable to fulfil its obligations;
(b) the branch belongs to a group with a strong financial position;
(c) the branch is subjected to consolidated supervision by a recognised and competent home supervisory authority; and
(d) effective home-host supervisory cooperation arrangements between the Bank and the foreign insurer or foreign takaful operator's home supervisory authorities are in place.

3. Legal provisions

3.1 This policy document is issued pursuant to:
(a) sections 47(1), 143(1) and 266 of the Financial Services Act 2013 (FSA); and
(b) sections 57(1), 155(1) and 277 of the Islamic Financial Services Act 2013 (IFSA).

4. Effective date

4.1 This policy document comes into effect on [dd/mm/yyyy, a date which will be determined later with the finalisation of the policy document].

5. Interpretation

5.1 The terms and expressions used in this policy document shall have the same meanings assigned to them in the FSA and IFSA, as the case may be, unless otherwise defined in this policy document.

5.2 For the purposes of this policy document –

"**S**" denotes a standard, an obligation, a requirement, specification, direction, condition and any interpretative, supplemental and transitional provisions that must be complied with. Non-compliance may result in enforcement action;

"**G**" denotes guidance which may consist of statements or information intended to promote common understanding and advice or recommendations that are encouraged to be adopted;

"**board**" means the board of directors of a licensed person, including a committee of the board where the responsibilities of the board set out in this policy document have been delegated to such a committee;

"**licensed person**" refers collectively to –
(a) a licensed insurer;
(b) a licensed takaful operator;
(c) a professional reinsurer; and
(d) a professional retakaful operator;

"**non-participating life policy**" refers to a life policy not conferring any right to share in the surplus of a life insurance fund;

"**Participant Individual Fund**" or "**PIF**" refers to a takaful fund established to allocate a portion of a takaful participant's contributions for the purpose of investment or savings;

"**Participants Risk Fund**" or "**PRF**" refers to a takaful fund established to pool a portion of a takaful participant's contributions for the purpose of

meeting takaful claims associated with events or risks specified in the takaful certificate; and

"**senior management**" refers to the chief executive officer and senior officers of a licensed person.

6. Related legal instruments and policy documents

6.1 This policy document must be read together with other relevant legal instruments and policy documents that have been issued by the Bank, in particular –

(a) Risk-Based Capital Framework for Insurers;
(b) Risk-Based Capital Framework for Takaful Operators;
(c) Takaful Operational Framework;
(d) Appointed Actuary: Appointment and Duties;
(e) Appointed Actuary: Appointment and Duties (for reinsurers and retakaful operators);
(f) Financial Condition Report;
(g) Management of Participating Life Business; and
(h) Corporate Governance.

7. Policy documents superseded

7.1 This policy document supersedes –

(a) paragraphs 19.2 and 19.3 of Part D, Appendix VI and Appendix VII of the policy document on Risk-Based Capital Framework for Insurers issued on 17 December 2018;
(b) Guidelines on Valuation Basis for Liabilities of Family Takaful Business issued on 16 May 2012; and
(c) Guidelines on Valuation Basis for Liabilities of General Takaful Business issued on 15 May 2012.

PART B GOVERNANCE

8. Roles of the board, senior management and appointed actuary

S 8.1 A licensed person must set up appropriate provisions for insurance or takaful liabilities, to ensure that adequate funds are available to meet all contractual obligations and commitments as they fall due. For licensed takaful operators[1] (including professional retakaful operators), this includes liabilities in the shareholders' fund as well as family or general takaful funds.

S 8.2 The board and senior management are accountable for ensuring effective oversight and governance of the valuation of insurance or takaful liabilities. This shall be supported by robust internal policies and controls to ensure compliance with relevant laws, regulations and prudential requirements, including those relating to Shariah for licensed takaful operators.

S 8.3 In fulfilling its responsibilities under paragraph 8.2, the senior management must:

(a) establish relevant internal policies and controls related to the valuation of insurance or takaful liabilities;
(b) establish mechanisms and processes to monitor compliance with the internal policies and controls related to the valuation of insurance or takaful liabilities at all times;
(c) ensure adequate resources and support for the appointed actuary to perform the valuation of liabilities, including data, systems, people and technology;
(d) ensure that the duties of the appointed actuary can be discharged without any hindrance;
(e) provide[2] the appointed actuary with unrestricted access to the relevant data, records and accounts, and furnish any requested information in a timely manner;
(f) set up reserves for insurance or takaful liabilities in accordance with the valuation results prepared by the appointed actuary and authorised by the chief executive officer; and
(g) undertake actions in a timely manner based on the results of the valuation and discussion with the appointed actuary.

S 8.4 In performing his/her duties related to the valuation of insurance or takaful liabilities, the appointed actuary must:

[1] The Shariah Advisory Council of the Bank has resolved that the setting up of provision for liabilities of takaful business is permissible. Holding provisions to ensure the ability of the takaful fund to meet its obligations is a prudent approach, as Shariah promotes taking precautionary measures to address future uncertainty.

[2] Section 79 of the FSA and section 88 of the IFSA require the licensed person and any director, officer or controller of the licensed person to –

(a) provide the appointed actuary all information within its or his/her knowledge or capable of being obtained by it or him/her which the appointed actuary may require; and
(b) ensure that all such information provided under paragraph (a) is accurate, complete, not false or misleading, in any material particular,

to enable the appointed actuary to carry out his/her duties and functions.

(a) comply with the requirements specified in paragraphs 9.1(a) and 9.4 of the policy document on Appointed Actuary: Appointment and Duties (BNM/RH/STD 029-5);
(b) determine the level of reserves required, based on his/her professional valuation of the insurance or takaful liabilities of the licensed person, in accordance with the requirements in this policy document;
(c) discuss the results of the valuation with the senior management and highlight issues that have implications on the financial condition of the licensed person; and
(d) submit a report on the results of the valuation of insurance or takaful liabilities to the board and senior management annually, no later than 3 months after the financial year end.

9. Data and information used for valuation

S 9.1 A licensed person must have in place internal policies, processes and procedures to ensure that the data used for the valuation of liabilities is appropriate, sufficiently credible, accurate and complete.

S 9.2 In assessing the appropriateness of the data used, a licensed person must ensure that, at minimum:
(a) the data is adequate to support the determination of assumptions and application of measurement methodologies;
(b) the data provides a sufficient level of granularity to enable an assessment of the underlying risks of the insurance or takaful contract; and
(c) data from different time periods are used consistently.

S 9.3 A licensed person must ensure that adequate checks are carried out to assess the credibility, accuracy and completeness of data.

S 9.4 In the event that there are reasons to believe that the data may not be credible, accurate and/or complete, a licensed person must ensure that an assessment is carried out to ascertain whether the use of such data may produce material biases in the results. In such circumstances, the appointed actuary must apply professional judgement and make adjustments or allowances in his/her estimations, where deemed necessary.

G 9.5 Adjustments to the data may also be made by a licensed person to account for abnormal items (e.g. large losses or catastrophe losses).

S 9.6 In the event that any adjustments or allowances are made, a licensed person must clearly document such actions and include, at minimum, the following information:
(a) description of the data limitations;
(b) impact of the data limitations in carrying out the valuation;
(c) description of the actions taken to address the data limitations; and
(d) rationale for the adjustments or allowances made.

S 9.7 Where industry data is used, the same quality of data must be observed by the licensed person, as would have been the case if the licensed person's data is used. In this regard, the licensed person must be able to demonstrate knowledge of the source of the data and the assumptions or methodologies adopted to process the data.

S 9.8 A licensed person must clearly document any use of industry data and include, at minimum, the following information:
(a) source of the data;
(b) assumptions and/or methodologies adopted to process the data;
(c) rationale for the use of industry data instead of own data; and
(d) actions taken to develop own data.

S 9.9 In addition to quantitative information, a licensed person must also consider qualitative information and factors that would have an impact on the appropriateness of the valuation results, including, at minimum:
(a) underwriting policy and processes;
(b) claims policy and processes;
(c) reinsurance or retakaful arrangements;
(d) features of the policy or takaful certificate;
(e) legal decisions affecting claims settlement;
(f) operational issues, including changes to systems and personnel; and
(g) any other information relevant for the purposes of valuation of insurance or takaful liabilities.

PART C MEASUREMENT OF LIABILITIES

10. General requirements

S 10.1 A licensed person must calculate the liabilities of an insurance or takaful contract in compliance with the requirements set out in the following paragraphs, where the liabilities consist of:
(a) the central estimate liabilities; and
(b) a provision of risk margin for adverse deviation (PRAD).

11. Recognition and derecognition of contracts

S 11.1 A licensed person must recognise an insurance or takaful contract from the earliest of the following:
(a) the beginning of the coverage period of the contract; and
(b) the date when the first premium or takaful contribution payment from the policy owner or takaful participant becomes due. If there is no contractual due date, the first payment from the policy owner or takaful participant is deemed to be due when it is received.

S 11.2 A licensed person must derecognise an insurance or takaful contract when the obligations specified in the contract expire, are discharged or cancelled.

Questions

1. For the purpose of determining when the first premium or takaful contribution becomes due:
   (a) How does your company define the "contractual due date" for the payment of the first premium or takaful contribution?
   (b) Are there any products with no contractual due date for the payment of the first premium or takaful contribution payment? If yes, please provide details on the products, views on any potential difficulties in applying the requirements in paragraph 11.1, and suggestions on alternative treatment, if any, for such products.

2. Does your company currently receive premiums or takaful contributions before the beginning of the coverage period of the contract? If yes, please provide the following information:
   (a) How these premiums or takaful contributions are currently treated (e.g. held as additional provisions until the policies or takaful certificates are incepted, or accounted for as part of the insurance or takaful liabilities); and
   (b) Whether the treatment of such premiums or takaful contributions would change in light of the requirements in paragraph 11.1. Please elaborate on the changes required and the wider impact of these changes (e.g. on the balance sheet and other relevant operational aspects).

   [Additional data required: For input in Workbook A
   Amount of these premiums or takaful contributions in terms of monetary amount and percentage of total gross written premiums or takaful contributions]

3. In relation to pipeline premiums or takaful contributions, please provide the following information:
   (a) How your company defines pipeline premiums or takaful contributions;
   (b) How these premiums or takaful contributions are currently treated (e.g. held as additional provisions or accounted for as part of the insurance or takaful liabilities); and
   (c) Whether any changes to the methodology, internal policies or systems will have to be made in order to comply with the requirements in paragraph 11.1. Please elaborate on the changes required and the wider impact of these changes (e.g. on the balance sheet and other relevant operational aspects).

   [Additional data required: For input in Workbook A
   Amount of these pipeline premiums or takaful contributions in terms of monetary amount and percentage of total gross written premiums or takaful contributions]

4. The proposed requirements intend to ensure that a contract is recognised as soon as the legal obligation is created. In your view, are there any other circumstances, apart from the receipt of premiums or takaful contributions, which may be construed as the creation of a company's legal obligation to policy owners or takaful participants? If yes, please elaborate with reasons and details of any challenges that can be foreseen in accounting for these other circumstances.

5. Please elaborate on any other challenges in applying the requirements on recognition and derecognition of contracts (e.g. for contracts with conversions or modifications).

12. Boundary of a recognised contract

S 12.1 In measuring the liabilities of a recognised contract, a licensed person must ensure that the time horizon ("boundary of a contract") and corresponding cash flows taken into account are reflective of the underlying obligations of the contract. In order to do so, the licensed person must determine the boundary of a contract such that it ends when:
   (a) the licensed person can no longer compel the policy owner or takaful participant to pay the premiums or takaful contributions; or
   (b) the licensed person no longer has a substantive obligation to provide the policy owner or takaful participant with services or coverage. The licensed person must assess when this substantive obligation ends according to paragraph 12.2.

S 12.2 A substantive obligation to provide services or coverage ends when:
   (a) the licensed person has the practical ability to reassess the insurance or takaful risks[3] of the particular policy owner or takaful participant and, as a result, can set a price or level of benefits that fully reflects those risks; or
   (b) both of the following criteria are satisfied:
      (i) the licensed person has the practical ability to reassess the insurance or takaful risks of the portfolio of insurance or takaful

[3] Insurance or takaful risks do not include lapse, expense and investment risks.

contracts that contains the contract and, as a result, can set a price or level of benefits that fully reflects the risks of that portfolio; and

(ii) the pricing of the premiums or takaful contributions for coverage up to the date when the insurance or takaful risks are reassessed does not take into account the risks that relate to future periods after the reassessment date.

S 12.3 In relation to paragraph 12.2(a), a licensed person has the practical ability to set a price at a future date that fully reflects the risks of the contract from that date if there are no constraints that prevent the licensed person from:

(a) setting the same price it would for a new contract with the same characteristics as the existing contract issued on that future date; or

(b) amending the benefits to be consistent with the price it will charge.

S 12.4 In relation to paragraph 12.2(b)(i), a licensed person has the practical ability to set a price that fully reflects the risks of the portfolio if it is able to reprice an existing contract such that the price reflects the overall changes in the risks of a portfolio of insurance or takaful contracts, even if the price set for each contract does not reflect the risks specific to the contract.

G 12.5 **Appendix I** sets out guidance on the assessment of the contract boundary for common insurance or takaful contracts.

S 12.6 Notwithstanding paragraph 12.1, with regard to medical and health insurance or takaful contracts, a licensed person must determine the contract boundary such that it covers the entire duration where coverage is contractually guaranteed, even if premiums or takaful contributions are not guaranteed. This includes contracts where renewability is guaranteed.

Questions

6. Are there any contracts for which you face challenges in determining the boundary? If yes, please provide details on the features of the contracts, the challenges faced and the proposed way forward.

7. With regard to medical and health insurance and takaful contracts, it is proposed that the contract boundary covers the entire duration for which the coverage is contractually guaranteed, in consideration of the lack of practical ability to fully reprice these contracts. For example:
   (a) If renewability of a yearly renewable medical and health insurance or takaful contract is guaranteed for 10 years, the contract boundary should cover the 10 years.
   (b) For a medical and health insurance or takaful contract which provides coverage for 10 years, the contract boundary should cover the 10 years even if the premiums or takaful contributions are reviewable during the duration of cover.

   (i) Please provide views on whether the proposed treatment reflects the characteristics of these contracts and whether there are any implications arising from the proposal.

(ii) Does your company have any participating medical and health insurance products which can be repriced? If yes, please explain how repricing is considered against revisions of bonus rates.

[Additional data required: For input in Workbook A
For medical and health insurance and takaful contracts other than non-guaranteed yearly renewable and participating ones, please provide the liabilities under two scenarios:
(i) Where there is no ability to reprice; and
(ii) Where there is ability to reprice. In both scenarios, the contract boundary must cover the entire duration for which the coverage is contractually guaranteed.]

13. General requirements on central estimate liabilities

Principles for the calculation of central estimate

S 13.1 A licensed person must determine the central estimate liabilities as the probability-weighted average of future cash flows that will arise as the licensed person fulfils the obligations of the insurance or takaful contract, discounted to allow for the time value of money.

S 13.2 In determining the central estimate, a licensed person must adequately consider the variability and uncertainty of cash flows in order to ensure that they represent the mean of the distribution of cash flow values.

G 13.3 In relation to paragraph 13.2, it may not be necessary or possible to explicitly account for all possible scenarios or develop probability distributions in all cases. As such, the licensed person may use other methods to proxy all scenarios, for example by using generally accepted closed-form solutions.

S 13.4 A licensed person must measure the central estimate liabilities gross of reinsurance or retakaful. The recoveries from reinsurance or retakaful arrangements, which are to be determined net of any payments to the reinsurer or retakaful operator, are to be measured separately.

S 13.5 In the event that the value of the central estimate liabilities is determined to be negative, a licensed person must not zeroise the central estimate liabilities.

Cash flow projections

S 13.6 In determining the central estimate, a licensed person must include:
(a) cash flows arising from claim events that have occurred before or at the valuation date, where the obligations to meet these cash flows have not been extinguished; and
(b) all future cash flows that are within the boundary of the contract.

S 13.7 A licensed person must not include any amounts relating to expected premiums or takaful contributions or expected claims outside the boundary of the insurance or takaful contract in the measurement of the liabilities of the

contract. In this regard, cash flows that may arise from future new business must not be taken into account in the measurement of liabilities of the insurance or takaful contracts.

S 13.8 In estimating future cash flows, a licensed person must:
(a) incorporate in an unbiased way, all reasonable and supportable information about the amount, timing and uncertainty of those future cash flows;
(b) take into account relationships between inter-dependent cash flows, including those arising from separate but related contracts; and
(c) ensure that the estimates reflect conditions existing at the valuation date, including assumptions at that date about the future.

G 13.9 In relation to paragraph 13.8(b), examples of relationships that must be considered include those between:
(a) basic policies or takaful certificates, and riders or add-ons; and
(b) cash flows in different funds, such as the PRF and the shareholders' fund for takaful contracts.

S 13.10 A licensed person must include the following as cash inflows within the boundary of an insurance or takaful contract:
(a) future premiums or takaful contributions;
(b) potential recoveries on incurred claims and from future claims, including recoveries from pre-payment of benefits, salvage and subrogation; and
(c) for takaful contracts, shareholders' fund income, including remuneration from the PRF and the PIF.

S 13.11 A licensed person must include the following as cash outflows within the boundary of an insurance or takaful contract:
(a) future payments to (or on behalf of) policy owners or takaful participants, in relation to claims that have already been incurred, as well as those expected to be incurred after the valuation date; and
(b) direct and indirect expenses that will be incurred in fulfilling the insurance or takaful contract, including but not limited to, administrative, investment management, claims management, acquisition and overhead expenses. For takaful contracts, expenses are those incurred by both the takaful and shareholders' funds.

S 13.12 In relation to paragraph 13.11(a), a licensed person must include discretionary payments such as bonuses to participating life policy owners and surplus distribution to takaful participants. In doing so, the licensed person must take into account future management actions that would reasonably be expected to be carried out under the specific circumstances to which those actions apply.

G 13.13 In relation to paragraph 13.12, examples of future management actions are bonus revisions for participating life contracts and decisions on the distribution of surplus for takaful contracts.

S 13.14 A licensed person must also identify and take into account all contractual options and financial guarantees embedded in the respective contracts. The central estimate of these options and guarantees must be valued using a stochastic method, unless they do not form a significant portion of the business and the result of using a deterministic method would not materially depart from that using a stochastic method.

Methods for determining the central estimate liabilities

S 13.15 A licensed person must ensure that the method used to determine the central estimate liabilities is appropriate to the nature of the liabilities, in order to achieve the outcome required under paragaph 13.1.

G 13.16 The choice of method for determining the central estimate liabilities would differ according to whether the liabilities relate to life insurance or family takaful, or general insurance or general takaful contracts. For example:

(a) the central estimate liabilities of life insurance and family takaful contracts are typically determined using discounted cash flow approaches, applied on a contract-by-contract basis, which explicitly takes into account the probabilities of the risk factors materialising (e.g. death, survival, disability and morbidity); and

(b) the central estimate liabilities of general insurance and general takaful contracts are typically determined using aggregated projections of run-off claims triangles, frequency-severity models, estimations based on expected loss ratios, or a combination of these methods. These methods may also be suitable for life insurance and family takaful contracts, particularly those with contract boundary of one year or less.

Determination of homogeneous risk groups

S 13.17 For the purposes of valuation, a licensed person must group the insurance or takaful contracts based on homogeneity of risks (“homogeneous risk groups”).

S 13.18 In assessing whether the risks are homogeneous, a licensed person must consider, at minimum, the following areas:

(a) the risk drivers of the contract, taking into account the features of the product and the risk profiles of the policy owners or takaful participants;

(b) the nature and duration of exposure to the risk; and

(c) how risk is shared between contracts, including in relation to any internal policies on surplus participation or sharing and/or cross-subsidy.

G 13.19 In assessing the areas set out in paragraph 13.18, a licensed person may consider the following factors:

(a) for risk drivers, the coverage provided by the contract, underwriting practices, inception year, any underlying options and guarantees and the stability of experience and risk characteristics over time; and

(b) for the nature and duration of exposure to the risk, not just the length of the contractual obligation, but also the nature of the tail of the risk.

S 13.20 In addition to the homogeneity of risks, a licensed person must take into account the following when determining the grouping of insurance or takaful contracts:
(a) the methodology that will be applied to determine the central estimate liabilities of the insurance or takaful contracts within the group; and
(b) the level of information needed to facilitate the analysis necessary to determine the assumptions underlying the central estimate. In this regard, the licensed person must balance between the credibility of data available and homogeneity of risk chararacteristics within the group.

G 13.21 The appropriate level of homogeneity generally differs for different types of contracts. For example:
(a) for life insurance and family takaful contracts, the homogeneity of risks is typically considered in terms of product type, the expected experience of risk factors (e.g. mortality, morbidity) and the way in which risk is shared between different contracts; and
(b) for general insurance and general takaful contracts, the homogeneity of risks is typically considered in terms of business lines/sub-lines, length of the contractual obligation and/or nature of the tail of the risks.

Assumptions underlying the central estimate

S 13.22 In determining the appropriate assumptions for a homogeneous risk group, a licensed person must take into account:
(a) the licensed person's actual experience and, where relevant and appropriate, industry benchmark data; and
(b) expectations on future changes that may affect the cash flows of the contracts.

S 13.23 In relation to paragraph 13.22, a licensed person must consider, where relevant and appropriate, the following factors:
(a) demographic assumptions, including mortality and morbidity;
(b) policy owners' or takaful participants' behaviour, including persistency rates, and the exercise of other contractual options;
(c) expenses;
(d) economic inflation;
(e) claims behaviour; and
(f) counterparty default on recoveries, including from reinsurance or retakaful arrangements, pre-payment of claims, salvage, subrogation and structured products.

G 13.24 Further guidance on the setting of assumptions is set out in **Appendix II**.

S 13.25 A licensed person must periodically review and update the assumptions to ensure that they remain appropriate and relevant. At minimum, the licensed person must carry out a comparative study between actual and expected experience annually and use the outcome of the study to support the determination of assumptions.

S 13.26 A licensed person must ensure that the comparative study between actual and expected experience is carried out:
(a) at a sufficient level of granularity; and
(b) using an approach and basis that are appropriate to the nature of the risks underlying the contracts.

G 13.27 In relation to paragraph 13.26, a licensed person may consider the different approaches and bases as follows:
(a) for life insurance and family takaful contracts, the actual and expected experience may be analysed according to individual key risk factors, such as mortality, persistency, expense and investment, and based on policy or takaful certificate count and/or sum assured or sum covered; and
(b) for general insurance and general takaful contracts, the analysis may be carried out on actual and expected claims experience of the entire homogeneous risk group. In addition, further analysis may be carried out based on the number of claims, average claims cost and claims frequency.

Questions

8. Is there any undistributed surplus in any of the insurance funds or PRFs which has not been accounted for in determining the central estimate liabilities? If yes, please provide reasons for not including the surplus (e.g. assessed to be the estate, contractual limitations to surplus sharing).

   [Additional data required: For input in Workbook A
   Amount of undistributed surplus which has not been accounted for in the central estimate liabilities]

9. Are there any challenges in assessing and accounting for relationships between inter-dependent cash flows? If yes, please elaborate with details of the types of products or features which have given rise to the challenges.

10. Have you used stochastic models in determining the central estimate liabilities? If yes, please provide details of the products for which such models have been used, including types of products and aspects for which a stochastic model has been adopted. If no, please elaborate on the considerations and the approach you are likely to take moving forward.

11. In relation to paragraph 13.23(f),
    (a) How have you taken into account counterparty default in determining the central estimate for recoveries? Please elaborate.
    (b) Please provide the difference in reinsurance or retakaful recoveries (in terms of percentage) between two scenarios:
        (i) Where counterparty default is considered; and
        (ii) Where counterparty default is not considered.

14. Specific requirements for life insurance and family takaful contracts

S 14.1 A licensed person must carry out cash flow projections, used in the measurement of central estimate liabilities, separately for each life insurance or family takaful contract.

S 14.2 Where separate projections for each life insurance or family takaful contract is not possible and the licensed person carries out the cash flow projection by grouping the life insurance or family takaful contracts, it must ensure that:

(a) there are no significant differences in the nature and complexity of the risks underlying the life insurance or family takaful contracts in the same group;

(b) the grouping of life insurance or family takaful contracts does not misrepresent the risks inherent in the life insurance or family takaful contracts and does not misstate their expenses; and

(c) the grouping of life insurance or family takaful contracts is likely to give approximately the same results for the measurement of central estimate liabilities as that of a projection on a per life insurance or family takaful contract basis.

S 14.3 If a cash flow projection by groups of life insurance or family takaful contracts is adopted, the licensed person must clearly document the supporting justifications.

S 14.4 In projecting the cash flows for participating life contracts, a licensed person must reflect the impact of managing the contracts according to cohorts, which have been determined in line with the requirements in paragraph 10.3 of the policy document on Management of Participating Life Business (BNM/RH/PD 032-1). This includes taking into account the restrictions on cross-subsidy between cohorts.

Questions

12. Based on your understanding of the requirements, please describe how the following items have been taken into account in determining the central estimate liabilities. If they have not been taken into account, please elaborate on the current treatment and how you intend to treat them moving forward.
    (a) Policy loans
    (b) Funds held on deposit

    [Additional data required: For input in Workbook A
    Amount of policy loans and funds held on deposit]

13. In relation to management actions, please describe, where applicable:
    (a) For participating products, the methodology used to account for bonus adjustments, any challenges faced in modelling the cash flows and the proposed way forward.
    (b) For universal life products, the methodology used to account for changes in crediting rates, any challenges faced in modelling the cash flows and the proposed way forward.

[Additional data required: For input in Workbook A
For participating products, please provide the liabilities under two scenarios: i) Based on your current approach; and ii) Incorporating future management actions regarding bonus rates]

14. Are there any contracts for which you have used the method more commonly used for general insurance or general takaful contracts, as described under paragraph 13.16(b)? If yes, please provide details of the relevant products, approach taken and the considerations for the choice of approach.

15. Specific requirements for general insurance and general takaful contracts

S 15.1 For general insurance and general takaful contracts, a licensed person must determine the central estimate liabilities for homogeneous risk groups for the expired and unexpired portions of risk separately, where:

(a) the expired portion of risk relates to all claim events that have already occurred before or at the valuation date, whether already reported or not, where the obligations to meet these cash flows have not been extinguished ("claims liabilities"); and

(b) the unexpired portion of risk relates to future events that are expected to occur after the valuation date and within the boundary of the contract ("unexpired risk reserve (URR)").

S 15.2 In relation to paragraph 15.1, a licensed person must measure the central estimate liabilities as the discounted value of the expected cash inflows and outflows within the boundary of the underlying contracts.

S 15.3 In relation to paragraph 15.2, a licensed person must explicitly account for claims inflation in determining the central estimate liabilities.

S 15.4 In relation to paragraph 15.1(a), in determining the claims liabilities, a licensed person must ensure that more than one method is used, and comparisons are made between the results of different methods. Where the results differ significantly, the licensed person must clearly document the ultimate choice, with justifications.

G 15.5 Examples of methods that may be used to determine the claims liabilities include the Chain Ladder, Bornhuetter-Ferguson and Frequency-Severity methods.

S 15.6 A licensed person must ensure that claims that have been reported ("claims reported") are accounted for appropriately and in a timely manner. In this regard, the licensed person must:

(a) enter every claim intimation it receives in its register of claims, which is maintained in compliance with paragraph 15.1(b) of the policy document on Management of Insurance Funds (BNM/RH/PD 032-15) or paragraph 20.8 of the policy document on Takaful Operational Framework

(BNM/RH/PD 033-7), no later than 14 days from the date of receipt of the claim intimation, unless it establishes that the claim does not relate to any of its policies or takaful certificates; and

(b) carry out the necessary investigations and assessments to determine its liability if the details of a claim intimation are insufficient for it to determine whether the claim relates to its policy or takaful certificate.

S 15.7 A licensed person must account for expected claims behaviour until such time the claim is barred by the statute of limitations.

S 15.8 In relation to paragraph 15.1(b), the URR must not be equal to the unearned premium or unearned takaful contribution calculated without any adjustments to adequately reflect the unexpired portion of risk.

G 15.9 For a reasonably homogeneous and stable risk group with contract boundary of one year or less, a licensed person may estimate the URR by extending the outstanding claims valuation model on the basis of claims frequencies, average claims costs and ultimate loss ratios or some similar measure of exposure. If this is done, adjustments may be made to the assumptions to reflect the impact of discounting future claims, changes in risk exposure, underwriting standards, premium or takaful contribution rate levels, or other relevant factors on the expected future claims experience.

Questions

15. In relation to paragraph 15.1(b), please describe how the URR has been calculated for contracts with boundary of one year or less.

16. Please describe the methodology for determining the central estimate liabilities for contracts with boundary of more than one year (e.g. long-term fire insurance and takaful contracts, guaranteed yearly renewable medical and health insurance and takaful contracts), including any challenges faced and potential ways forward.

17. In your view, what would be an appropriate methodology for determining the liabilities relating to the Malaysian Motor Insurance Pool (MMIP)? Please describe your proposed methodology in sufficient detail.

16. Specific requirements for takaful contracts

S 16.1 In estimating future cash flows for the determination of the central estimate liabilities, for each takaful contract, a licensed takaful operator must take into account the inter-dependent cash flows managed under the PRF, PIF and shareholders' fund (SHF).

S 16.2 In line with paragraph 16.1, a licensed takaful operator must account for expected future distributions of surplus from the PRF to the shareholders' fund as an inter-fund cash flow.

G 16.3 **Figure 1** illustrates the cash flows underlying a takaful contract, taking into account the interactions between the PRF and the shareholders' fund, and other forms of income to the SHF.

G 16.4 The requirement to account for inter-dependent cash flows for each takaful contract set out in paragraph 16.1 does not preclude a licensed takaful operator from carrying out cash flow projections by grouping takaful contracts, provided that the conditions under paragraph 14.2 are met.

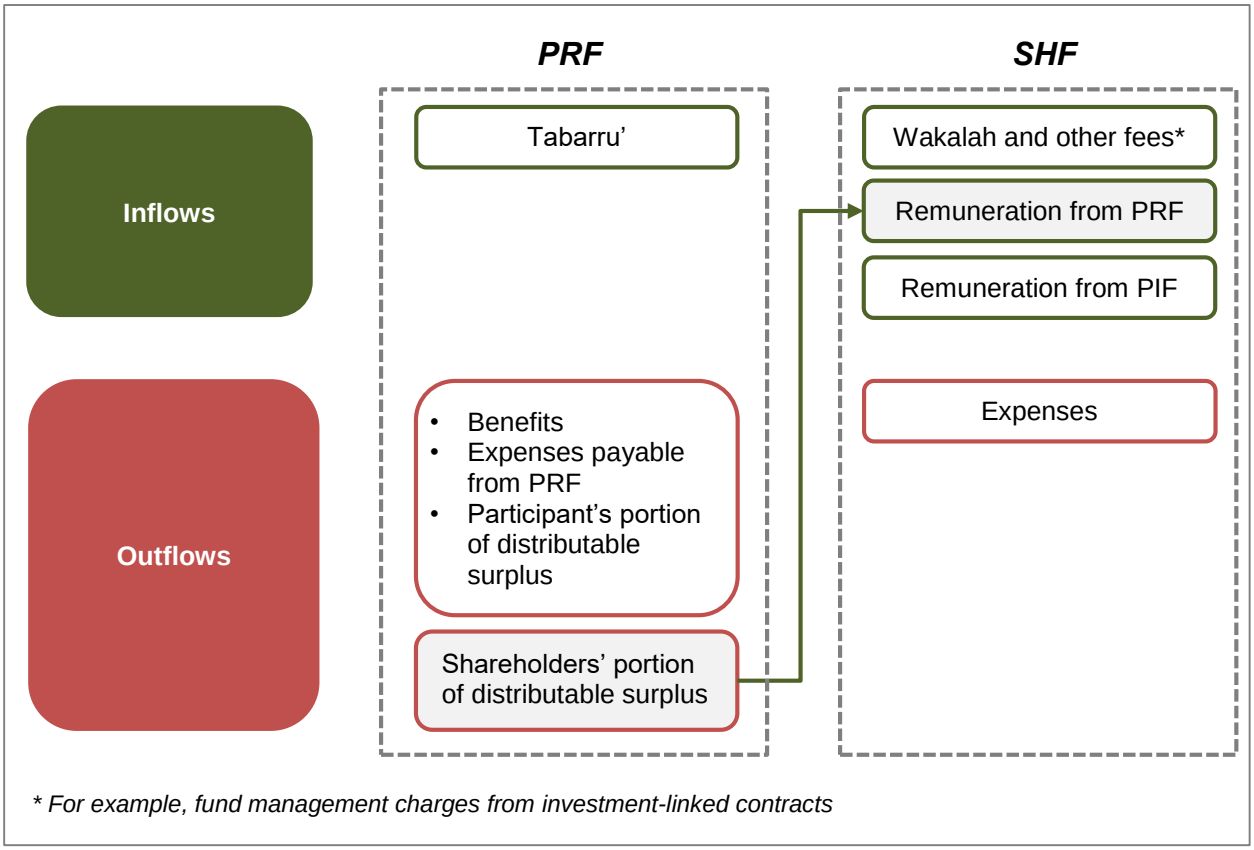
S 16.5 In relation to future surplus or profit distributions from the PRF and the PIF:

(a) The licensed takaful operator must ensure that these cash flows are estimated in accordance with its internal policies on surplus management and remuneration from PIF; and

(b) For future surplus distributions from the PRF, which are determined at a level higher than individual takaful contracts, the licensed takaful operator must reallocate the estimated future surplus distribution back to the individual contracts to determine the central estimate liabilities.

S 16.6 Notwithstanding the requirement to consider the inter-dependence of cash flows for each takaful contract, a licensed takaful operator must report the liabilities according to the relevant funds, in line with paragraph 21.6.

Figure 1: Illustration of interactions between cash flows of takaful contracts



Questions

18. In relation to surplus sharing,
    (a) Please describe the internal policy on surplus sharing among takaful participants (for example, surplus sharing criteria, considerations in pooling takaful participants, use of the asset share concept); and
    (b) Please elaborate on how the surplus expected to be shared is re-allocated to the respective contracts for valuation purposes.

    [Additional data required: For input in Workbook A
    Please provide quantitative data which represents how surplus is shared between contracts]

19. Please provide your Shariah committee's views on the proposed requirements in respect of determining the central estimate liabilities, such as whether the method for determining the expected future surplus distributions to takaful participants and shareholders is in line with the Shariah principles on probability and time value of money.

17. Specific requirements for inwards reinsurance and inwards retakaful contracts

S 17.1 For inwards reinsurance and inwards retakaful contracts, a licensed person must determine the central estimate liabilities for homogeneous risk groups for the expired and unexpired portions of risk separately, in line with the requirements for general insurance and general takaful contracts under paragraph 15.

S 17.2 For inwards reinsurance and inwards retakaful contracts, a licensed person must consider the unique characteristics of specific treaties or circumstances. This includes, but is not limited to:
    (a) treaties where termination is on a clean-cut basis;
    (b) inwards reinsurance or inwards retakaful business written from countries with strong experience of litigation; and
    (c) inwards reinsurance or inwards retakaful business where there is a possibility of latent claims exposure.

G 17.3 Additional guidance on inwards reinsurance and inwards retakaful is set out in **Appendix III**.

Questions

20. Please describe the methodology that your company uses to determine the central estimate liabilities for inwards reinsurance or inwards retakaful contracts. Please explain if there is a need to make changes to the methodology in light of the proposed requirements.

21. Please elaborate on any challenges faced or likely to be faced in measuring the central estimate liabilities of inwards reinsurance or inwards retakaful contracts. Please explain how you intend to manage these challenges.

18. Reinsurance and retakaful recoveries

S 18.1 A licensed person must determine the expected net recoveries from reinsurance or retakaful arrangements for each direct underlying contract by projecting the expected future cash flows arising from the reinsurance or retakaful arrangement.

S 18.2 In determining the amount of recoveries from the reinsurance or retakaful arrangement, a licensed person must:

(a) assess the substance of the reinsurance or retakaful arrangement in place by considering the reinsurer or retakaful operator's contractual obligations to the licensed person. This must include an assessment on renewability of the reinsurance or retakaful contract and reviewability of the reinsurance premiums or retakaful contributions; and

(b) incorporate all relevant expected future cash flows, based on the assessment carried out under paragraph 18.2(a), including future payments to the reinsurer or retakaful operator, in relation to the particular underlying contract.

S 18.3 In estimating the future cash flows for the reinsurance or retakaful arrangement, a licensed person must:

(a) use assumptions that are consistent with those used to estimate the future cash flows of the underlying insurance or takaful contract; and

(b) take into account the risk of counterparty default.

S 18.4 Where it is not practical for a licensed person to explicitly determine the expected net recoveries from reinsurance or retakaful arrangements for each underlying contract according to paragraph 18.1 and the licensed person uses a simplified method to derive the expected net recoveries from reinsurance or retakaful arrangements, this must be documented.

G 18.5 For example, for some reinsurance or retakaful arrangements which are non-proportional, the net reinsurance or retakaful recoveries may be derived as the difference between gross and net central estimate liabilities.

Questions

22. In relation to paragraph 18.2(b), please explain how expected profit commissions is treated, in determining the amount of reinsurance or retakaful recoveries. Please provide the rationale for such treatment.

23. Do you foresee any challenges in explicitly deriving the expected reinsurance or retakaful recoveries according to paragraph 18.1? If yes, please elaborate and provide details on any simplifications which you intend to adopt (e.g. notional reattribution), with rationale.

19. Discount rate

S 19.1 A licensed person must use the discounting approach outlined in paragraph 19 to discount all future cash flows when determining the central estimate liabilities of the insurance or takaful contracts. The same yield curve is to be used to discount all cash flows arising from a particular contract, and its inter-dependent contracts.

S 19.2 A licensed person must set assumptions for investment returns which are consistent with the rates used for discounting future cash flows.

A. Overall design of the yield curve

The Bank intends to make enhancements to the discounting approach such that there is greater consistency and better reflection of the cost of writing long-term products. In doing so, the Bank is exploring potential designs for these enhancements.

In this regard, the Bank would like to seek your feedback on the proposed discounting approach:

(a) the base risk-free yield curve; and
(b) for ringgit-denominated life insurance and family takaful contracts with boundary greater than one year, a positive adjustment to the risk-free yield curve, either in the form of:
    (i) a volatility adjustment; or
    (ii) a matching adjustment,
    where the applicability of adjustments will depend on the nature of the cash flows.

An overview of the proposed enhancements to discounting approach is as follows:

Discount rates and description of key features	Eligible contracts	Approval requirements

Base risk-free yield curve
• The base risk-free rate will be derived based on the Smith-Wilson methodology.
• The method relies on additional inputs which are not in the methodology used in the existing requirements.
	• All general insurance and general takaful contracts
	• For life insurance and family takaful contracts:
	  ○ Unitised or account-based contracts; and
	  ○ Any other contracts which do not meet the criteria for the application of the volatility or matching adjustment, or which meet the criteria but the licensed person has chosen not to apply any adjustments.
		The Bank's prior approval is not required.

Base risk-free yield curve plus volatility adjustment • The volatility adjustment is linked to the adjusted AA-rated spread of a fixed representative portfolio of the insurance or takaful industry's holdings in corporate bonds or sukuk.	Ringgit-denominated life insurance and family takaful contracts with: • contract boundary greater than one year; and • highly predictable cash flows, as assessed against the criteria specified in the section on volatility adjustment (Item C(1)).	The Bank's prior approval is required to apply the volatility adjustment. • Following approval, if the criteria can no longer be met, the licensed person must stop applying the adjustment and notify the Bank of this.
Base risk-free yield curve plus matching adjustment • The matching adjustment is linked to the licensed person's own ring-fenced matching asset portfolio.	Ringgit-denominated life insurance and family takaful contracts with: • contract boundary greater than one year; • highly predictable cash flows, as assessed against the criteria specified in the section on matching adjustment (Item C(2)); and • a specifically identified, ring-fenced matching asset portfolio backing the liabilities.	The Bank's prior approval is required to apply the matching adjustment. • Following approval, if the criteria can no longer be met, the licensed person must stop applying the adjustment and notify the Bank of this.

The details of the design, including the proposed parameters are set out in the following sections. All parameters may be subject to change over time.

B. The base risk-free yield curve

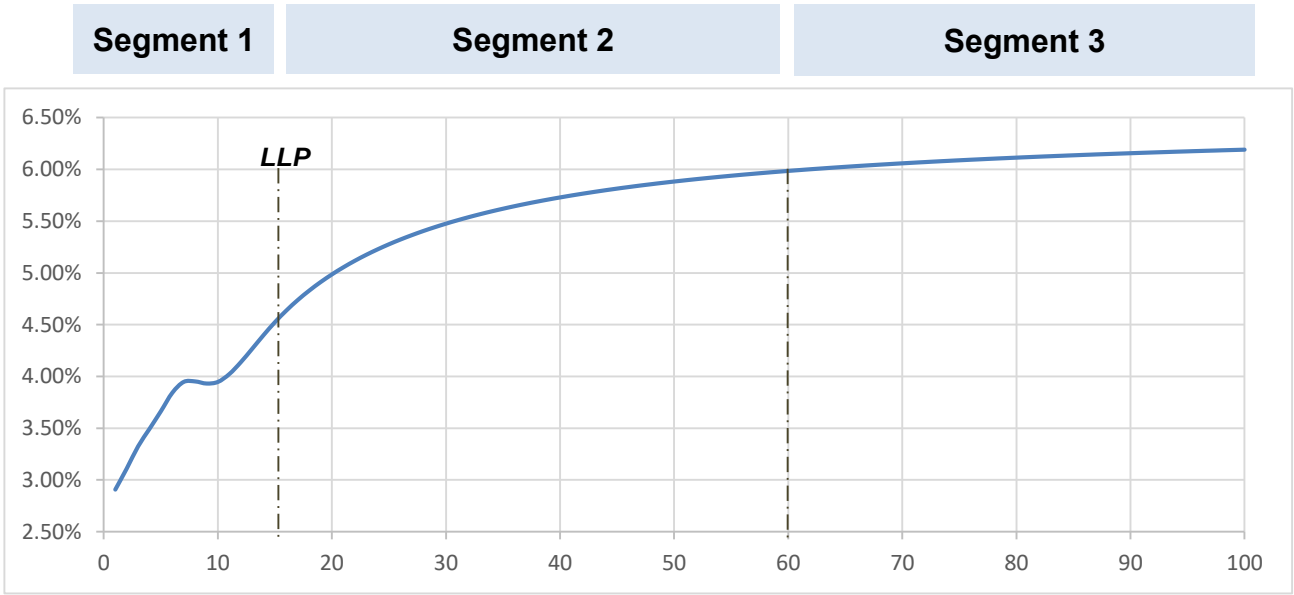
i. <u>Methodology for determining the base risk-free yield curve</u>

The Bank proposes that the base risk-free yield curve for discounting cash flows be derived based on the Smith-Wilson methodology, which generates a market consistent, continuous interest rate term structure.

The proposed yield curve consists of three segments, as follows:

Segment	Durations covered	Methodology for setting rates
1	Up to the duration of the last liquid point (LLP)	Rates set based on market information of government securities with matching duration, where available. Where market information is not available, the rates are to be interpolated using the Smith-Wilson method.
2	After the LLP but less than 60 years	Rates extrapolated from Segment 1 using the Smith-Wilson method.
3	60 years or more	Rates determined by applying the long-term forward rate (LTFR).

Figure 2: Illustration of the three segments of the base risk-free yield curve



ii. Parameterisation of the base risk-free yield curve

1. For Malaysian ringgit denominated cash flows, the following parameters are proposed:
   (a) for Segment 1, the market information up to the LLP of 15 years refers to the zero-coupon spot yield of Malaysian Government Securities (MGS) for insurance contracts, or Government Investment Issues (GII) for takaful contracts. The MGS or GII zero-coupon spot yields must be obtained from a recognised bond pricing agency in Malaysia, or any other source as may be specified by the Bank;
   (b) for Segment 2, the LLP is 15 years and the alpha parameter, which determines the speed of convergence between the LLP and the LTFR, is set at 0.156; and
   (c) for Segment 3, the LTFR is set at 5%.

   These parameters have been used to create the base risk-free yield curve which is to be used for quantitative testing. The rates are provided in Workbook B.

2. For non-ringgit denominated cash flows, the parameters will be currency-specific, as set out in **Appendix IV**.

Questions on the base risk-free yield curve

Methodology

D1. Please provide your views on the Smith-Wilson method, in particular:
   (a) For purposes of quantitative testing, the Bank has generated the base risk-free yield curves (as set out in the response templates). Given the parameters set out in this exposure draft, are you able to re-produce the base risk-free yield curve specified in the templates? If no, please provide details on the challenges faced and recommend possible solutions for the challenges.
   (b) In your view, are there alternative extrapolation models that would provide a better reflection of the cost of writing long-term products? If yes, please elaborate on the methodology, rationale of the proposed model and the differences between the proposed model and the Smith-Wilson model. In this regard, please consider,

amongst others, the market consistency of the model, smoothness of the modelled rates, and the technical and operational ease of calibrating the necessary parameters.

Parameters

D2. The LLP represents the last point obtained from market observations. One of the considerations in calibrating the LLP is the availability and transparency of market prices of the underlying financial instruments (e.g. the observable market yields may be less credible if the average daily number of trades is low).
   (a) Please provide your views on whether the proposed LLP of 15 years is appropriate for the MGS and GII markets.
   (b) If you would like to propose alternatives to be considered, please elaborate, with justifications.

D3. The LTFR is assumed to target a nominal long-term growth rate which consists of projected inflation based on historical average rates of inflation and forecasted real economic growth based on studies by the Organisation for Economic Cooperation and Development (OECD). This estimate is consistent with that adopted for the Insurance Capital Standards (ICS) developed by the International Association of Insurance Supervisors (IAIS).
   (a) Please provide your views on whether the LTFR of 5% is appropriate. If you would like to propose alternative parameters to be considered, please elaborate, with justifications.
   (b) Do you agree that the LTFR is applied to the yield curve at year 60 onwards? If you would like to propose for the LTFR to be applied at earlier or later durations, please elaborate with justifications.

D4. The speed of convergence between the LLP and the LTFR (as represented by the alpha parameter) highly determines the shape of Segment 2 of the yield curve. In selecting the alpha parameter, the difference between the extrapolated forward rate at duration 60 and the LTFR was considered. In this regard, the difference has been targeted to be no more than 1bps.
   (a) Please provide your views on appropriateness of the alpha parameter. If you would like to propose alternatives to be considered, please elaborate, with reasons.
   (b) The alpha is dependent on the extrapolated forward rate at year 60, which is related to market movements. Please provide your views on the circumstances which would warrant a review and/or a change in the alpha parameter.

D5. Does Appendix IV sufficiently cover your non-ringgit denominated cash flows? Please provide details on any currencies which have not been captured and your views on how the relevant information to determine the parameters can be obtained.

D6. If you have suggested alternative models to be used to derive the base risk-free yield curve under Question D1, please provide your proposal for the calibration of the parameters underlying the model, with justifications.

C. Adjustments to the base risk-free yield curve

i. Overview of adjustments

The adjustments described in this section would only be applicable to life insurance and family takaful contracts with contract boundary greater than one year at inception. With that said, not all contracts would qualify for an adjustment. A licensed person is only allowed to apply one of the two adjustments to the cash flows of a particular contract, and the choice of adjustment must be based on the outcome of the assessment against the prescribed criteria below. The application of adjustments is not compulsory, and a licensed person may choose not to apply the adjustments even if the contracts have been assessed to be eligible.

A licensed person must seek approval from the Bank prior to applying any adjustments. Once approval is obtained for the specified contracts, the licensed person must ensure continued compliance with the criteria. If the licensed person is no longer able to comply with the criteria, the licensed person must stop applying the adjustment and notify the Bank of this.

ii. Applicability of the adjustments

(a) Adjustments can only be considered for contracts with highly predictable cash flows. In line with this, the following contracts would not qualify for any adjustments:
   (i) contracts with non-ringgit denominated cash flows; and
   (ii) contracts with unitised or non-unitised accounts, including investment-linked contracts, universal life contracts, and takaful contracts with PIF from which charges flow to the PRF on a regular basis (e.g. regular-drip products).

   Cash flows underlying these contracts are not considered to be highly predictable as the insurance charges, tabarru', fund management charges, other fees and charges and the duration of the contract are linked to movements in the external market.

(b) In addition, there are specific criteria that must be adhered to in order to qualify for the application of the adjustments. These are detailed in the respective sections on the volatility adjustment and the matching adjustment below.

1. Volatility adjustment (VA)

i. Objective

The intention of the VA is to minimise the impact of short-term market volatility on the licensed person's solvency position. The proposed approach will pass through a proportion of the spreads observed in the market to the valuation of liabilities, thereby resulting in greater consistency between the valuation of assets and liabilities.

ii. Additional criteria for applicability of the adjustment

(a) The licensed person must ensure that the strategic asset allocation (SAA) for the contracts is designed to meet at least the guaranteed or fixed cash flows to a high degree of certainty, with a significant proportion of fixed income investments allocated to high quality fixed income assets; and
(b) The licensed person must be able to demonstrate that it is able to adhere to its SAA over a business cycle of at least three years.

iii. Considerations for approval

In assessing an application for approval, the Bank will consider relevant factors, including:

(a) the level of predictability of cash flows. In particular, whether the cash flows exhibit characteristics which are similar to contracts that do not qualify for adjustments;

(b) the licensed person's ability to demonstrate that it has in place a clear governance structure and robust internal policies and procedures to ensure continuous adherence to the criteria for applicability of the adjustment. In particular, poor governance resulting in divergence from the SAA, and excessive risk taking via large investments in poor quality assets are unlikely to result in eligibility for the adjustment; and

(c) the feasibility of the licensed person to realistically earn the spread amounting to the VA.

iv. Design

The VA is designed to recognise the proportion of corporate bond or sukuk spreads which is not required to cover credit risks (i.e. the illiquidity premium), derived based on a reference portfolio consisting of the aggregate asset holding of the insurance or takaful industry respectively. The adjustment is to be applied to the base risk-free yield curve up to the duration of the LLP.

The Bank proposes that the VA be determined as follows:

$$Volatility\ Adjustment = average\ factor * volatility\ proportion * min\ (AA\ spreads\ based\ on\ selected\ market\ input\ as\ at\ valuation\ date,\ limit\ on\ spreads\ for\ which\ credit\ can\ be\ taken)$$

v. Parameterisation

The proposed parameters are as follows:

(a) Average factor: 40% for licensed insurers and 50% for licensed takaful operators

(b) Volatility proportion: 60%

(c) Limit on spreads for which credit can be taken: 125bps

(d) Market input for AA spreads: Yield difference between an AA2 Financial class bond or Corporate class sukuk (as classified by Bond Pricing Agency Malaysia (BPAM)) of duration 7 years and MGS or GII of the same duration

vi. Basis for the design and parameterisation

(a) The proposed derivation is a simplification of the following formula:

$$Volatility\ Adjustment = \sum_i \left(x_i \times volatility\ proportion \times \min(market\ spread\ of\ rating\ i,\ maximum\ spread\ for\ rating\ i)\right)$$

where,

$i = eligible\ rating\ of\ corporate\ bond\ or\ sukuk\ i.e.\ AAA, AA\ and\ A$;

$x_i =$

$proportion\ of\ asset\ holdings\ in\ bond\ or\ sukuk\ rated\ i\ in\ the\ industry\ reference\ portfolio$;

$volatility\ proportion = percentage\ of\ spread\ attributed\ to\ illiquidity\ premium$

(b) Acknowledging the complexities in designing the VA, the following approach has been taken in deriving the parameters:

(i) the proportion of asset holdings in each corporate bond or sukuk rating category is based on the average actual proportion held in the last 3 years by life insurers and family takaful operators respectively;
(ii) the market input for spreads at duration 7 years is assumed to represent the market spread applicable for the respective rating category, as it is the median duration based on secondary trading volume data;
(iii) the volatility proportion is assumed to be 60%, based on empirical studies which suggest that approximately 20% to 40% of the credit spreads can be attributed to credit events; and
(iv) the average factor represents the industry's eligible corporate bond or sukuk investment as a proportion of total investments, based on an industry-wide reference portfolio.

(c) For simplicity, the Bank has used the AA corporate bond or sukuk as a basis for deriving the VA, as it is broadly representative of the industry's holdings of corporate bonds or sukuk. The average factor is derived by comparing the volatility-adjusted spread of an AA corporate bond or sukuk against the weighted volatility-adjusted spreads of AAA, AA and A corporate bonds or sukuk at the month-end data points for the last 3 years. The weights were determined based on the proportion of holdings of AAA, AA and A bonds or sukuk in the reference portfolio of the insurance and takaful industries respectively. BBB bonds or sukuk were excluded from the reference portfolio, as it was observed that such holdings were not significant (less than 0.5% of total assets).

vii. Data request [for input in Workbook B]

For contracts where the licensed person intends to apply the VA, the licensed person is required to provide the following data:
(a) liabilities calculated based on the risk-free yield curve; and
(b) liabilities calculated based on the risk-free yield curve plus VA.

The parameters described in this section have been used to create the 'base risk-free yield curve + VA' which is to be used for quantitative testing. The rates are provided in Workbook B.

Questions on the VA

Criteria for applicability

D7. Please provide your views on the criteria for applicability. If you would like to propose alternatives or other factors to be considered, please elaborate, with justifications.

D8. In your view, would contracts that are not fully unitised (e.g. universal life contracts and contracts with a PIF) have highly predictable cash flows, considering that the company has control on the investment decisions and/or growth rate of the account value of the contract? If yes, please provide justifications and recommend reasonable tests to be conducted to demonstrate the level of predictability of the cash flows.

D9. For licensed takaful operators, how do you propose to apply the above approach in the case where the PRF contains a mix of products which are not eligible for the VA and those which are?

Design and parameters

D10. For the purposes of this exposure draft, the market input for spreads of each rating category is based on the spot yield of a Financial class bond and Corporate class sukuk obtained from BPAM, as these classes were observed to have the highest secondary trading volume over the last 2 years. In your view, what would be an appropriate source and basis for the market input used? If you have alternative proposals to that specified in the exposure draft, please elaborate with details on the source, classification and rationale.

D11. Please provide your views on the appropriateness of the simplifications proposed (as explained under the basis of the design and parameters section). If you would like to propose alternatives or other factors to be considered, please elaborate, with justifications.

D12. In relation to the construction of an industry reference portfolio:
(a) Please provide your views on the appropriateness of the overall approach. In particular, do you foresee any complications or issues (for example, the mix being largely dependent on the asset allocations of larger companies)? If you would like to propose alternatives to be considered, please elaborate, with justifications.
(b) For licensed takaful operators, the industry reference portfolio is an aggregate of the PRF(s) and the shareholders' fund, recognising the cash flows for the identified contracts which reside in these funds. Is this approach to constructing an industry reference portfolio appropriate? What are your Shariah committee's views on the approach in relation to the differing asset ownership of PRF(s) and shareholders' fund? If you would like to propose alternatives to be considered, please elaborate, with justifications.

2. Matching adjustment (MA)

i. Objective

The MA serves the same purpose as the VA but allows a higher magnitude of adjustments for portfolios that have better matching of assets and liabilities.

ii. Additional criteria for applicability of the adjustment

A licensed person must evidence predictability and a high degree of matching between assets and liabilities. In this regard, the licensed person must ensure that:

(a) the matching portfolio consisting of assets covering the corresponding liabilities are explicitly identified, and managed separately from the rest of the fund. In this regard, the licensed person must demonstrate that it is able to secure the ring-fenced assets;
(b) the SAA for the ring-fenced assets is designed to meet the cash flows to a high degree of certainty, with a significant proportion of fixed income investments allocated to high quality fixed income assets. In addition, the licensed person must demonstrate that it is able to adhere to the SAA over a business cycle of at least three years;
(c) the value of liabilities is not materially sensitive to lapse, mortality, morbidity and expense stress. In this regard, the value of liabilities is deemed not to be materially sensitive if the application of the insurance or takaful risk charges under the Risk-Based Capital Framework for Insurers (RBC) or Risk-Based Capital Framework for Takaful Operators

(RBCT) does not shift the discounted cash flow of the matching portfolio's liabilities by more than 15%, in the situation where the cash flows are discounted using the base yield curve;

(d) shortfalls in future years can be met by asset cash flows that have not been allocated to meet liability cash flows in earlier years, subject to a reduction in the MA to account for the reinvestment of excess cash flows at the risk-free rate;

(e) contracts underlying the liabilities do not have future premiums or takaful contributions (e.g. fully paid up contracts, annuities); and

(f) contracts with surrender options do not have surrender values that exceed the value of the assets covering the liabilities at the valuation date.

iii. Considerations for approval

In assessing an application for approval, the Bank will consider relevant factors, including:

(a) the level of predictability of cash flows. In particular, whether the cash flows exhibit characteristics which are similar to contracts that do not qualify for adjustments; and

(b) the licensed person's ability to demonstrate that it has in place a clear governance structure and robust internal policies and procedures to ensure continuous adherence to the criteria for applicability of the adjustment. In relation to maintenance of the matching portfolio, the internal policies and procedures should cover at least the following:
   (i) identification of the matching portfolio;
   (ii) the transfer of assets in or out of the matching portfolio; and
   (iii) monitoring of the degree of matching between assets and liabilities, and steps to address any deviations.

iv. Design

The MA is equivalent to a positive fixed adjustment to be applied to the base risk-free yield curve up to the duration of the LLP.

The Bank proposes that the MA be determined as follows:

$$Matching\ Adjustment = y_{GRY} - y_{adjusted} - y_{CRA} - y_{liability}$$

where,

$y_{GRY} =$ Average gross redemption yield of the allocated assets in the matching portfolio;

$y_{adjusted} =$ Adjustment for the use of excess assets to meet future shortfall. Excess assets are assumed to earn returns in line with the base risk-free yield curve;

$y_{CRA} =$ Adjustment for credit risk based on allocated assets;

$y_{liability} =$ The average rate of return of the liability cash flows as referenced to the base risk-free yield curve.

The adjustment for credit risk is proposed to be determined as follows:

$$y_{CRA} = \sum_i \left(x_i \times RC_i \times \min(spread\ of\ selected\ market\ input\ for\ rating\ i, maximum\ spread\ for\ rating\ i)\right)$$

where,

$i = eligible\ rating\ of\ corporate\ bond\ or\ sukuk\ i.e.\ AAA, AA\ and\ A$;

$x_i =$
$proportion\ of\ asset\ holdings\ allocated\ to\ bond\ or\ sukuk\ rated\ i\ in\ the\ matching\ portfolio$;
$RC_i = percentage\ of\ spread\ attributed\ to\ risk\ correction$

v. Parameterisation

The proposed parameters are as follows:
(a) Percentage of spread attributed to risk correction: 40%
(b) Maximum spread that can be taken for credit rating AAA: 75bps
(c) Maximum spread that can be taken for credit rating AA: 125bps
(d) Maximum spread that can be taken for credit rating A: 225bps for licensed insurers and 300bps for licensed takaful operators
(e) Market input: Yield difference between a Financial class bond or Corporate class sukuk (as classified by BPAM) of duration 7 years and MGS or GII of the same duration

vi. Basis for the design and parameterisation

Acknowledging the complexities in designing the MA, the following approach has been taken:
(a) the market input for spreads at duration 7 years is assumed to represent the market spread applicable for the respective rating category, as it is the median duration based on secondary trading volume data;
(b) the volatility proportion is assumed to be 60%, based on empirical studies which suggest that approximately 20% to 40% of the credit spreads can be attributed to credit events; and
(c) BBB bonds or sukuk were excluded as it was observed that such holdings were not significant (less than 0.5% of total assets).

vii. Data request [for input in Workbook B]

A licensed person which intends to apply the MA must provide the information as requested in Workbook B.

Questions on the MA

Criteria for applicability

D13. Please provide your views on the criteria for applicability. If you would like to propose alternatives or other factors to be considered, please elaborate, with justifications.

D14. Based on the matching portfolios that you have proposed for your company, would the ring-fencing of assets be sufficient to ensure that the contracts in the portfolio are sustainable until the end of their terms? Please comment and elaborate on any additional safeguards, with justifications.

D15. In your view, are there any practical constraints to managing the matching portfolios (e.g. process required to set up a matching portfolio, monitoring)?

D16. Considering the criteria and requirements on maintaining a matching portfolio, please provide your views on the relative costs and benefits of applying the MA.

D17. Are there products in your portfolio which in your view should be eligible for the MA but do not meet the 15% sensitivity threshold set out in paragraph ii(c)? If yes, please provide details on the products, your rationale, and the impact of applying the insurance or takaful risk charges under the RBC or RBCT to the discounted cash flow of the liabilities.

Design and parameters

D18. For the purposes of this exposure draft, the market input for spreads of each rating category is based on the spot yield of a Financial class bond and Corporate class sukuk obtained from BPAM, as these classes were observed to have the highest secondary trading volume over the last 2 years. In your view, what would be an appropriate source and basis for the market input used? If you have alternative proposals to that specified in the exposure draft, please elaborate with details on the source, classification and rationale.

D19. Please provide your views on the appropriateness of the simplifications proposed (as explained under the basis of the design and parameters section). If you would like to propose alternatives or other factors to be considered, please elaborate, with justifications.

D20. It has been proposed that the MA be applied only up to the LLP. In your view, should the MA be applied beyond the LLP? If yes, please provide reasons and recommend, with justifications, a suitable methodology to taper the MA towards the risk-free yield curve after the LLP (e.g. straight line approach).

D21. For licensed takaful operators, please provide your views on whether the market observations are sufficient in volume to provide a credible basis for the observed spreads for each rating category. Should you have an alternative proposal, please elaborate, with justifications.

General questions on the overall design

D22. Do you agree with the proposed design in deriving discount rates for the purpose of valuing liabilities, as described above? If you would like to propose alternative methodologies to be considered, please elaborate, with justifications.

D23. Do you agree with the differentiation between the base yield curve and the additional adjustments? If you would like to propose alternatives to be considered, please elaborate, with justifications.

D24. The key principles underlying the criteria for the applicability of the adjustments are predictability of cash flows and for the MA, the degree of matching between assets and liabilities as well. In view of this, it has been proposed that the adjustments be considered only for life insurance and family takaful contracts, and not for general insurance and general takaful contracts. This is intended to reflect the relatively low predictability of cash flows underlying general insurance and general takaful contracts.

If you are of the view that there are general insurance or general takaful contracts with highly predictable cash flows, and which would meet the criteria set out for the adjustments, please provide:

- details on these contracts;
- justifications for the applicability of VA or MA to these contracts; and
- recommendations on reasonable tests to be conducted to demonstrate the level of predictability of the cash flows.

D25. For licensed takaful operators, what is your Shariah committee's views on the proposed design and approach taken to derive the applicable discount rates? In particular, are there any aspects of the design which may not be in line with Shariah principles and/or require specific Shariah considerations?

Suggested further reading:

- *'A Technical Note on the Smith-Wilson Method' by the Financial Supervisory Authority of Norway*
- *Public Consultation Document on Risk-based Global Insurance Capital Standard (ICS) Version 2.0 by the International Association of Insurance Supervisors*
- *IAIS Base Yield Curve Methodology for ICS Version 2.0 by the International Association of Insurance Supervisors*
- *Technical documentation of the methodology to derive EIOPA's risk-free interest rate term structures by the European Insurance and Occupational Pensions Authority*

20. Provision of risk margin for adverse deviation (PRAD)

S 20.1 In order to reflect the uncertainty in the amount and timing of future cash flows, a licensed person must apply a PRAD such that the valuation of cash flows relating to guaranteed benefits, or takaful benefits and expenses, secures a 75% level of sufficiency.

S 20.2 In determining the PRAD, a licensed person must account for the relationships between inter-dependent cash flows, in a manner that is consistent with that used for the central estimate liabilities.

G 20.3 In relation to paragraph 20.2, for example, the PRAD for takaful contracts should not be determined on a fund basis but from a takaful certificate perspective, taking into account the interactions between funds.

S 20.4 A licensed person must not apply PRAD to the discount rates or the projected investment returns.

S 20.5 In relation to PRAD applied to reinsurance or retakaful recoveries, a licensed person must determine this as the amount of risk transferred by the licensed person to the reinsurer or retakaful operator.

Diversification for general insurance and general takaful business

S 20.6 Where a licensed person accounts for the diversification of risk arising from correlations between the risks from different homogenous risk groups, it must do so only by way of reducing the levels of PRAD calculated at homogenous risk group level. In addition, it must ensure that:

(a) the valuation of liabilities has a 75% level of sufficiency at entity level;
(b) the amount of diversification benefit is determined using an appropriate methodology; and
(c) the diversification discount adopted is no more than 50% of the aggregate of the PRADs of all homogeneous risk groups.

S 20.7 In relation to paragraph 20.6(a), where a licensed person uses a triangle of combined data to determine the amount of diversification benefit, the licensed person must give due regard to the extent that underlying volatilities may be obscured.

S 20.8 A licensed person must clearly document in the valuation report the methodology used to determine the amount of diversification benefit, with the rationale for the chosen methodology and limitations, if any.

Questions

24. For life insurance and family takaful business, the PRAD should be determined in line with the basis described under paragraph 20.1 (i.e. without considering discretionary payments). The PRAD should then be held on top of the total central estimate liabilities, in line with the requirement of paragraph 10.1. Please provide your views on:
    (a) The approach in setting PRAD; and
    (b) Whether or not diversification should be taken into account in determining the PRAD, with reasons. If yes, please propose a suitable methodology, with sufficient details.

PART D REPORTING

21. Reporting to the Bank

S 21.1 A licensed person must submit the report on valuation of insurance or takaful liabilities, together with the annual audited financial statements, to the Bank within three months from the financial year end.

S 21.2 Notwithstanding the grouping of risks that a licensed person may use in determining the insurance or takaful liabilities in relation to paragraph 13.17, the licensed person must report the value of the liabilities based on the classifications specified in paragraphs 21.3 to 21.6.

S 21.3 A licensed person carrying on life insurance business must report the liabilities for its life insurance contracts separately for the following:
(a) ordinary life business or annuity business;
(b) individual life or group life;
(c) participating life business, non-participating life business, investment-linked business or universal life business; and
(d) cohorts for participating life business, as set out in the licensed person's policy for the management of its participating life business.

S 21.4 A licensed person carrying on family takaful business must report the liabilities for its family takaful contracts separately for the following:
(a) protection or annuity;
(b) ordinary family business or investment-linked business; and
(c) individual family or group family.

S 21.5 A licensed person carrying on general insurance or general takaful business must report the liabilities for its contracts separately for the following classes of business:
(a) Aviation;
(b) Bonds;
(c) Cargo;
(d) Contractors' All Risks & Engineering;
(e) Fire - separately for:
  (i) Long-Term Fire[4]; and
  (ii) Short-Term Fire;
(f) Liabilities - separately for:
  (i) Public Liability;
  (ii) Product Liability;
  (iii) Professional Indemnity;
  (iv) Directors & Officers Liability; and
  (v) Other Liabilities;
(g) Marine Hull & Liability;
(h) Medical & Health;
(i) Motor "Act";

[4] Fire insurance or fire takaful products with tenure or duration of cover that exceeds a continuous period of 12 months as per the Bank's specification letter dated 3 September 2018.

(j) Motor "Others";
(k) Offshore Oil & Gas Related;
(l) Personal Accident;
(m) Workmen's Compensation & Employer's Liability; and
(n) Others.

S 21.6 A licensed takaful operator or professional retakaful operator must also report the liabilities for its takaful contracts separately for the following:
(a) liabilities relating to the PRF(s) (i.e. takaful liabilities); and
(b) liabilities relating to the shareholders' fund (i.e. expense liabilities).

S 21.7 A licensed person must document the outcome of the comparative study of actual and expected experience required under paragraphs 13.25 and 13.26 in the valuation report. The documentation must include the appointed actuary's assessment and opinion on:
(a) the appropriateness of assumptions previously set;
(b) significant trends in experience over the past years, if any;
(c) deviations in actual experience from the previous assumptions;
(d) the underlying reasons for any material deviations of actual experience from the previous assumptions; and
(e) the rationale for the assumptions chosen for the current valuation period, with supporting qualitative and/or quantitative justifications.

Questions

25. For general insurance and general takaful business:
(a) Do you foresee any operational challenges in reporting liabilities according to the classifications in paragraph 21.5? Please elaborate on the challenges and propose alternative classifications, if any.
(b) Out of your 'Liabilities' line of business as per the current reporting, how significant is the business with duration of cover that is more than one year?
(i) Please state the magnitude in terms of monetary amount and percentage of gross written premiums or takaful contributions for the 'Liabilities' line of business.
(ii) Please list your 'Liabilities' sub-lines of business with duration of cover that is more than one year.
(c) Out of your 'Liabilities' line of business as per the current reporting, how significant is the claims experience which is long-tailed in nature?
(i) Please state the magnitude in terms of monetary amount and percentage of claims liabilities for the 'Liabilities' line of business.
(ii) Please list your 'Liabilities' sub-lines of business which have long-tailed claims experience.

APPENDICES

Appendix I Guidance on assessment of contract boundary for common contracts

1. For renewable insurance or takaful contracts:
   (a) a licensed person would not be considered to have the practical ability to reassess the risks at the policy or takaful certificate level if the renewability is guaranteed (i.e. the contract can be renewed without further underwriting). In such cases, with the exception of medical and health insurance and takaful contracts, the licensed person would then proceed to assess if it has the practical ability to reassess the risks at the portfolio level; and
   (b) a licensed person would be considered to have the practical ability to reassess the risks at the policy or takaful certificate level if the renewability is not guaranteed. In such cases, the licensed person would proceed to assess if it has the practical ability to set a price that fully reflects the risks of the contract, based on the criteria set out in paragraph 12.3 of this policy document. If there are constraints, the licensed person would then assess if it has the practical ability to reassess the risks at the portfolio level.

   Figure 3 illustrates the key decision points in the assessment of the practical ability to reassess the risks and set a price that fully reflects the risks for renewable contracts other than medical and health insurance and takaful contracts.

2. For insurance or takaful contracts (other than medical and health insurance and takaful contracts) with coverage period of more than one year but reviewable premiums or takaful contributions, the assessment of the contract boundary is similar to guaranteed renewable contracts as per paragraph 1(a) of this appendix.

3. For extension and conversion options, cash flows arising from such options are considered to be within the boundary of the original contract if:
   (a) the options are guaranteed; or
   (b) the pricing of premiums or takaful contributions up to the reassessment date takes into account the risks that relate to future periods, arising from the options.

4. For annuities, cash flows for the entire annuitisation period are considered to be within the boundary of the contract if the annuitisation phase is guaranteed, even if the annuitisation rate is not guaranteed.

Figure 3: Key decision points for assessment of renewable contracts (other than medical and health insurance and takaful contracts)

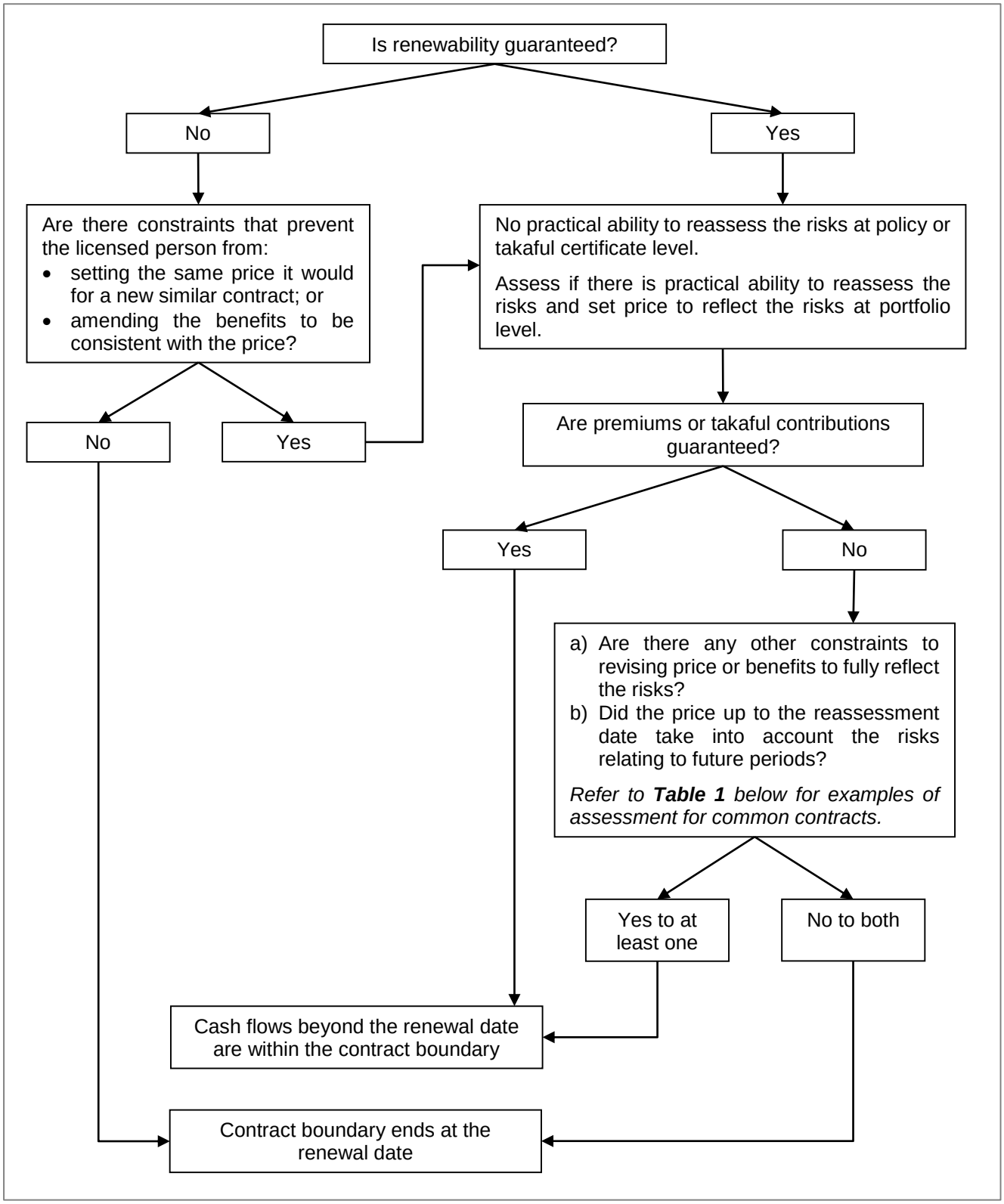


Table 1: Examples of assessment of practical ability to reassess risks at portfolio level, for contracts other than medical and health insurance and takaful contracts

Type of contract	At renewal date	
	Are there known practical constraints to revise price or benefits to fully reflect risks at the portfolio level?	**Did the pricing of premiums or takaful contributions up to the reassessment date take into account the risks that relate to future periods?**
Contracts with level premiums or takaful contributions	No	Yes The premiums or takaful contributions in earlier periods subsidise the premiums or takaful contributions in later periods
Contracts with step-rated premiums or takaful contributions (e.g. according to attained age)	No	No
Contracts with premiums or takaful contributions which are step-rated but level for specific periods of time (e.g. step-up every 3 years)	No	Yes The premiums or takaful contributions at the start of the step-up subsidise the premiums or takaful contributions until the next step-up
Contracts with coverage period of more than 1 year but reviewable premiums or takaful contributions (similar to guaranteed renewability)	Assess based on paragraph 12.4 of this policy document, considering factors which affect the practical ability to set a price that fully reflects the risks such as policy owners or takaful participants' reasonable expectations, feasibility of re-pricing, etc.	Refer to assessment for contracts with level or step-rated premiums or takaful contributions
Consortium products where assessment of price is not carried out at the company level	Yes	Not applicable

Appendix II Guidance on setting assumptions

1. *Mortality and morbidity*
   Mortality and morbidity assumptions should be determined taking into consideration the actual historical experience of the homogeneous risk group. Where it is determined that the licensed person's actual experience is inappropriate to be used in its entirety (for example, where the risk pool is not sufficiently large for data to be credible), industry or benchmark data may be used.

2. *Policy owners' or takaful participants' behaviour*
   Any assumptions made by the licensed person with respect to the likelihood that policy owners or takaful participants will exercise contractual options, including surrenders, lapses and withdrawals, should be based on an analysis of past behaviour and a prospective assessment of expected behaviour. In doing so, the licensed person should consider:
   (a) the influence of past and future economic conditions; and
   (b) the impact of past and future management actions.

3. *Expenses*
   The licensed person should consider the following bases in determining expense assumptions:
   (a) for distribution expenses (e.g. commissions), the actual costs incurred; and
   (b) for management expenses, the analysis of past expenses, with consideration for likely changes in the future, including due to inflation. The allocation of indirect expenses should also be carried out with regard to this analysis.

4. *Economic inflation*
   Examples of economic inflation factors are wage and price inflation. The licensed person should consider how these factors affect other assumptions (e.g. expenses, behaviour of medical claims). These factors may be determined based on the use of publicly available information on historical inflation and economists' forecasts.

5. *Claims behaviour*
   The licensed person should leverage on its own claims experience as well as industry analysis in order to better understand claims behaviour. In assessing claims behaviour, it should consider the following:
   (a) possible factors affecting claims behaviour including latency, legislative and environmental changes, trends in court awards, changes in consumer behaviour and technological improvements (including medical advances). These factors may impact not just the likelihood, frequency and severity of claims, but also the nature of the tail of the risk; and
   (b) where claims can be made by a third party or where there is a possibility of disputes or repudiation of claims, the licensed person should appropriately account for the likely outcomes.

6. *Counterparty default*
The adjustment for counterparty default should be based on an assessment of the probability of default of the counterparty, whether this arises from insolvency or dispute, and the average loss resulting from the default.

Appendix III Guidance on inwards reinsurance and inwards retakaful

1. Due to the more volatile nature of reinsurer or retakaful operator's claims experience and the lesser amount of data available to the reinsurers or retakaful operators as compared to direct insurers or direct takaful operators, the reinsurer or retakaful operator's own data may not be sufficient for the licensed person to reliably determine the central estimate liabilities. As such, the licensed person may have to utilise additional information obtained from external sources and exercise more judgement than in the case of direct insurance or direct takaful.

2. Data limitations may also have a significant impact on the licensed person's approach in calculating the PRAD. The licensed person may not be able to formulate PRAD assumptions based solely upon the reinsurer or retakaful operator's own data and hence, may need to consider how the levels of PRAD obtained for direct insurers or direct takaful operators could be adjusted to be applicable to reinsurance or retakaful.

3. The licensed person should also consider qualitative information to facilitate the determination of appropriate allowances to be made in the central estimate liabilities and PRAD. For example, the licensed person should seek to better understand the nature of the business written currently and in the past, the trends in reinsurance premium or retakaful contribution and exchange commission rates, and the types of reinsurance or retakaful programmes, limits and deductibles.

4. In determining the homogeneous risk groups, the licensed person should take into account the extent and reliability of the data. In addition, the licensed person may consider analysing the data by the following sub-groups:
   (a) type of reinsurance or retakaful (e.g. treaty proportional and non-proportional, facultative proportional and non-proportional);
   (b) geographical location of risk; and
   (c) line of business (e.g. property, marine, liability).

5. The licensed person should ensure that the measurement methodologies are appropriate based on the nature of the claims and exposure information available. For example, while the Incurred Chain Ladder, Expected Loss Ratio and Incurred Bornhuetter Ferguson methods are commonly used for contracts with boundary of one year or less, methods based on paid claims data are often not reliable due to the volatility of the available information.

6. The licensed person may find it more appropriate to carry out the valuation on an underwriting year basis, rather than on an accident year basis, as the reinsurance or retakaful data is usually presented in this manner. For this purpose, an approach that the licensed person may consider is as follows:
   (a) Determination of central estimate liabilities for expired portion of risk
      (i) The licensed person may conduct claims analysis by underwriting year and project the latest underwriting year's claims in full (ultimate claims cost), allowing for the estimated total written premiums or takaful contributions for each underwriting year (i.e. produce

triangulations of claims and written premiums or takaful contributions by underwriting year and develop all years to ultimate).

(ii) As the liabilities derived from such underwriting year analysis will include liabilities relating to both incurred outstanding claims and unexpired risks relating to unearned premiums or takaful contributions (particularly for the most recent underwriting year where most of the unearned premiums or takaful contributions lie), the licensed person should apportion the latest underwriting years' liabilities into earned and unearned components. The earned component may be determined by deducting the expected claims cost in respect of the unexpired portion of risk from the ultimate claims cost.

(b) Determination of central estimate liabilities for unexpired portion of risk

(i) The liabilities should be derived based on the expected claims cost in respect of the unexpired portion of risk plus allowance for the reinsurer or retakaful operator's expenses, including overheads and cost of reinsurance or retakaful, expected to be incurred during the unexpired period in administering these policies or takaful certificates and settling the relevant claims.

Appendix IV Parameters for non-ringgit denominated cash flows

The parameters to be used to derive the base risk-free yield curve for non-ringgit denominated cash flows are as set out in the table below.

Currency	Market information to be used as input to Segment 1	Last liquid point (LLP)	Long-term forward rate (LTFR)
AUD – Australian Dollar	Government Bonds	30	3.8%
EUR – Euro	Swaps	20	3.8%
GBP – Pound Sterling	Swaps	50	3.8%
HKD – Hong Kong Dollar	Swaps	15	4.4%
IDR – Rupiah	Swaps	10	8.0%
INR – Indian Rupee	Swaps	10	7.0%
JPY – Yen	Government Bonds	30	3.8%
PHP – Philippine Peso	Swaps	10	7.0%
SAR – Saudi Riyal	Swaps	15	6.0%
SGD – Singapore Dollar	Government Bonds	20	3.8%
THB – Baht	Government Bonds	10	5.0%
TRY – Turkish Lira	Government Bonds	10	7.0%
TWD – New Taiwan Dollar	Government Bonds	10	4.4%
USD – US Dollar	Government Bonds	30	3.8%

Source: Public 2019 IAIS Field Testing Technical Specifications (https://www.iaisweb.org/page/supervisory-material/insurance-capital-standard)

These parameters are subject to periodic review by the International Association of Insurance Supervisors (IAIS). The updated parameters will be published on the Insurance Capital Standards section of the IAIS website. A licensed person would be expected to ensure that the latest parameters are used when conducting the valuation of insurance or takaful liabilities.