



BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER
ECONOMIC BALANCE SHEET FRAMEWORK

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I. INTRODUCTION

1. This Consultation Paper outlines the economic balance sheet (“EBS”) framework proposed by the Bermuda Monetary Authority (the “Authority”), which is a principles-based approach accompanied by supporting guidelines. The proposals in this paper apply to Bermuda commercial¹ insurers², and also include insurance groups³ or Bermuda groups⁴ for which the Authority is the group supervisor⁵.

2. The Authority proposes embedding the EBS Framework as part of the Capital and Solvency Return (“C&SR”), and it would form the basis for the insurer’s Enhanced Capital Requirement (“ECR”). Insurers would still be required to provide the statutory financial statements as currently stated under Section 15 of the Insurance Act 1978 (the “Act”) until such time as the Authority revises the statutory basis of financial reporting.

3. The Authority will be making amendments to the prudential standards governing solvency requirements for the affected insurers and insurance groups. The C&SR will include a new EBS Schedule containing a balance sheet whose components would be valued using the EBS principles previously consulted upon. Many of the existing Schedules in the C&SR which refer to the present statutory balance sheet (Form 1A or Form 4) will be adjusted to refer to the EBS Schedule. The Authority believes that this method will facilitate changes should these be needed in future.

4. For the purposes of this paper, additional references are defined as follows:

“general business” as defined under section 1 the Act;

“insurance business” as defined under section 1 of the Act;

“insurance” includes “reinsurance”

¹ Commercial Insurers are Class C, Class D, Class E, Class 3A, Class 3B and Class 4 insurers.

² The term “insurer” also includes “reinsurer”.

³ Insurance group is defined under Section 1 of the Insurance Act 1978

⁴ “Bermuda group” is defined in the Authority’s *Guidance Note on Designated Insurer (May 2012)* and *Insurance Group Supervision Statement of Principles (May 2012)*.

⁵ Group Supervisor is defined under Section 27A of the Insurance Act 1978

“Long-Term business” as defined under section 1 of the Act; and

“principle of proportionality” or “proportionality” refers to flexibility under the supervisory framework depending on the nature, scale, and complexity of the insurer.

5. The insurance industry and other interested parties are invited to submit their views on the proposals set out in this paper, and also in the associated draft legislation. Comments should be sent to the Authority and addressed to policy@bma.bm no later than Friday, 30th January 2015.

II. BACKGROUND

6. In August 2010, the Authority issued a Discussion Paper (the “DP”), entitled “Economic Balance Sheet and Proposed Changes to Regulatory Reporting”, which considered the introduction of an EBS framework and proposed changes to regulatory reporting. The EBS framework is intended to provide a consistent and reliable valuation basis for regulatory reporting in line with proposed international standards. Revisions to the regulatory reporting framework are designed to facilitate the Authority’s review and understanding of Bermuda’s insurers, insurance groups and the insurance sector as a whole. The revisions will also enable the Authority to make valid comparisons between individual insurance entities. The DP set out the background to these proposed changes, elaborated on their rationale, and posed questions about the implementation of an EBS framework and revised regulatory reporting scheme.

7. In response to feedback on the DP, in August 2012 the Authority issued separate Consultation Papers (“CPs”) on the EBS framework for general business insurers and Long-Term insurers. A limited-scope trial run of the proposals was subsequently conducted with selected Class 3B and Class 4 insurers and the general insurance elements of Bermuda Groups.

8. During 2013, the Authority monitored the insurance accounting proposals put forward in Exposure Drafts issued by the International Accounting Standards Board (“IASB”) and Financial Accounting Standards Board (“FASB”). For many years, these organisations had been considering changes to insurance accounting frameworks. Such changes could have led to greater convergence in standards for insurance accounting than is currently the case, providing a sound basis on which the Authority could base its EBS proposals. It was expected that such an approach would minimise the extent to which insurers would effectively need to keep multiple sets of accounts. However, in the absence of a consensus internationally, the Authority is proceeding with its development of an EBS framework.

9. In May 2014, the Authority conducted a larger scale trial run of Class 3B, Class 4 and Bermuda Groups based on a slightly modified version of the August 2012 proposals. The results did not reveal any fundamental issues or problems.

10. A fundamental premise underlying the EBS framework for both general business and Long-Term insurers is the idea that assets and liabilities should be valued on a consistent economic basis. This common principle postulates the reduction or elimination, where possible, of accounting mismatches where no underlying economic mismatches exist. This would provide a more accurate picture of an insurer's or insurance group's solvency position and enhance overall protection for policyholders.

11. Other characteristics that guide the development of the EBS framework for insurers include:

- a. ***Consistency with International Regulatory and Accounting Standards:*** to ensure that Bermuda is consistent with international best practice, the EBS framework and reporting scheme should be aligned with the work of the International Association of Insurance Supervisors ("IAIS"). In order to reduce the burden on insurers and insurance groups, the EBS framework should also take into account existing Generally Accepted Accounting Principles and International Financial Reporting Standards (hereafter referred to collectively as "GAAP") such as those issued by the IASB and the FASB.
- b. ***Consistency with existing regulatory frameworks (or regulatory frameworks in development):*** to enhance regulatory cooperation and coordination with other regulators for the benefit of policyholders. The EBS framework should be established in a broadly consistent manner with other recognised regulatory frameworks, but where appropriate, reflect the unique characteristics of the Bermuda market.
- c. ***Proportionality:*** the EBS framework and reporting scheme adopted should be commensurate with the nature, scale, and complexity of the risks undertaken by the insurer. In particular, calculation methods, assumptions, modelling techniques, and data requirements should be adopted in a proportional manner.
- d. ***Governance and Review:*** a sound system of governance and review (undertaken by suitably qualified persons) should be in place to oversee and approve the processes involved in determining the economic values used to derive the EBS.

12. The Authority proposes to implement the EBS framework through the enactment of legislation as follows:

- a. Class 3B and Class 4 insurers – effective 1st January, 2016 with the first filing in 2017.
- b. Insurance Groups – effective 1st January, 2016 with the first filing in 2017.
- c. Class 3A insurers – effective 1st January, 2017 with the first filing in 2018.
- d. Class C, Class D and Class E insurers – effective 1st January, 2016 with the first filing in 2017. The filings for the year-end 2016 and 2017 would be on a partial EBS basis as the Authority intends to provide a two-year transition for insurance reserves to be calculated within the EBS framework. In the interim, Long-Term business insurers will continue to calculate their reserves (lines 20-27 of the statutory financial return) on the existing statutory basis of accounting. This transition period for Long-Term business is consistent with the approach being adopted in other jurisdictions implementing an EBS framework (e.g. Solvency II in the European Union).
- e. For Groups and those Long-Term insurers that also have a Class 3B or Class 4 licence (i.e. are Dual licence insurers) the full requirements for EBS, including valuation of Long-Term technical provisions (insurance reserves), would come into force on 1st January, 2016. For further details, please see section on timetable for EBS implementation.

III. FUNDAMENTAL COMPONENTS OF BERMUDA'S EBS FRAMEWORK

13. The EBS framework being proposed is based on the insurer's or insurance group's existing GAAP balance sheet as a starting point. Assets and other liabilities would mainly be valued using market values or the fair value option within the GAAP. Insurance technical provisions would be valued based on best-estimate cash flows, adjusted to reflect the time value of money using a risk-free discount rate term structure. In addition, there would be a risk margin to reflect the uncertainty inherent in the underlying cash flows. Certain intangible assets would be disallowed as they are considered too uncertain to form part of a solvency assessment.

14. The EBS should be produced on a consolidated basis for both commercial insurers and insurance groups following the consolidation method used for GAAP financial reporting. This approach is consistent with the Authority's stated aim, which will allow insurers to opt for a single audit to satisfy both statutory and public reporting requirements⁶ to limit audit costs and create reporting efficiencies.

15. Subject to prior approval of the Authority, insurers may elect to produce some or all of their EBS using principles of other EBS regulatory frameworks (like Solvency II, or other Authority-approved economic valuation principles).

16. The details are set out in the rest of this section.

A. Use of GAAP for Assets and Other Liabilities

17. Except where mentioned below, assets and liabilities (other than technical provisions) should be assessed and included on the EBS at fair value in line with the GAAP principles adopted by the insurer (as notified to and agreed by the Authority). In situations where the GAAP principles permit both a fair value and a non-economic valuation model for valuing an asset or liability, the insurer should apply the fair value model.

⁶ [Stakeholder Letter on Public Disclosures and other related matters](#)

18. For cases where the GAAP principles do not require an economic valuation, the insurer should value the asset or liability using the following hierarchy of high level principles governing valuation of assets and liabilities:

- a. insurers should use quoted market prices in active markets for the same or similar assets or liabilities;
- b. where the use of quoted market prices for the same assets or liabilities is not possible, quoted market prices in active markets for similar assets and liabilities with adjustments to reflect differences should be used;
- c. if there are no quoted market prices in active markets available, insurers should use mark-to-model techniques, which are alternative valuation techniques that have to be benchmarked, extrapolated or otherwise calculated as far as possible from a market input;
- d. insurers should make maximum use of relevant observable inputs and market inputs and rely as little as possible on undertaking-specific inputs, minimising the use of unobservable inputs;
- e. When valuing liabilities, no adjustments should be made to take account of the own credit standing of the Insurer.

i. Investments in and advances to affiliates

19. GAAP principles should be applied in determining whether an insurer has control or significant influence over other entities. Economic Balance Sheet valuation principles should be applied to those entities before deriving the values to be included for both consolidated and equity method accounted entities.

ii. Intangible Assets

20. Intangible assets should be recognised only if it is probable that the expected future economic benefits will flow to the insurer and that the cost of the assets can be measured reliably. The assets must be separable, and there should be evidence of exchange transactions for the same or similar assets indicating it is saleable in the market place. Intangible assets should be recognised at fair value. If a fair value measurement of an intangible asset is not possible, then such an asset should be valued at nil.

21. Goodwill should be valued at nil.

iii. Income Taxes

22. Current tax liabilities or assets for the current and prior periods should be measured at the amount expected to be paid to or recovered from the taxation authorities, using the tax rates that have been enacted or substantively enacted by the end of the reporting period.

23. Deferred tax assets and liabilities other than deferred tax assets arising from the carry-forward of unused tax credits and the carry-forward of unused tax losses, should be computed on the basis of the difference between the value ascribed to assets and liabilities recognised and valued in accordance the EBS principles, and the values ascribed to assets and liabilities as recognised and valued for tax purposes. Deferred tax assets should be recognised only to the extent they are more likely than not to be recoverable.

iv. Liabilities other than technical provisions

24. All contractual liabilities or contingent liabilities arising from off-balance sheet arrangements are to be recognised on the EBS. Contractual liabilities should be valued consistently with GAAP principles. Contingent liabilities shall be valued based on the expected present value of future cash-flows required to settle the contingent liability over the lifetime of that contingent liability, using the basic risk-free interest rate. Where the present value of contingent obligations cannot be determined, the liability should be valued at its undiscounted value.

25. Where the Authority has issued a Section 56 direction which effectively allows an insurer to treat a capital instrument as capital in its Statutory Financial Returns, rather than as a liability as GAAP would usually dictate, then a similar treatment should also be adopted for the EBS. In this situation, the insurer would need to apply to the Authority for an appropriate direction under Section 6C of the Act.

v. Other changes compared to GAAP

26. Existing GAAP deferred acquisition costs (“DAC”) are eliminated as an asset, but there will be corresponding adjustments to technical provisions.

27. Future expected instalments of premiums, for general business in particular, which may currently be recognised as an asset as part of receivables under GAAP, should not be included as an asset under EBS but should be reflected as part of technical provisions. Premiums which are due but have not been received should however continue to be recognised as part of receivables, with appropriate adjustments to reflect expected un-collectability.

B. Technical provisions – General Principles

28. Technical provisions comprise the sum of a best estimate and a risk margin. However, where cash flows associated with insurance obligations can be reliably replicated using financial instruments, then it may be possible to use the market values of those financial instruments as the technical provisions – see Section B(vi) - ‘Calculation of technical provisions as a whole’.

i. Calculation of the best estimate

29. The best estimate should be calculated using the following guidelines:

- a. The best estimate should reflect gross amounts, without deduction of amounts recoverable from reinsurance contracts or other risk transfer mechanisms.
- b. The best estimate of recoverable amounts should be calculated, and shown, separately.
- c. The calculation of the best estimate should take into account the time value of money, using the relevant risk-free interest rate term structure.
- d. The best estimate should not make any allowance for the insurer’s own credit standing.
- e. In line with actuarial best practices, insurers should segment their reinsurance obligations into homogeneous risk groups. The segmentation is a matter for individual insurers to determine, but insurers should be aware of the need to provide information on their best estimate technical provisions by statutory line of business for Bermuda Solvency Capital Requirement (“BSCR”) calculation purposes.

30. The best estimate should correspond to the probability-weighted average of future cash flows, discounted using the relevant risk-free interest rate term structure. It should therefore allow for uncertainty in future cash flows, and reflect the full potential range of possible outcomes, each weighted to reflect their respective probability of occurrence. However, this does not mean that additional margins should be held within the best estimate to reflect this uncertainty.

31. It is recognised that a ‘probability-weighted average of future cash flows’ is an aim, not a requirement, and that it may not be necessary to explicitly identify all such scenarios in the valuation. Traditional valuation methodologies common in Long-Term insurance and general insurance may be capable of adequately allowing for all possible scenarios. However, due regard would need to be paid to events that may not be adequately reflected in the data used for such traditional approaches (these events have been referred to in the recent past as ‘Binary Events’, but the scope is wider than remote but potentially severe events, and are now often referred to as ‘ENIDs’ (events not in data set)).

32. The valuation should use unbiased current assumptions, which should be based on a combination of relevant, credible experience as well as expert judgement as to potential future trends and developments. At each valuation date, the insurer should: consider whether the assumptions used are still appropriate; and be able to justify any changes (or non-changes).

ii. Cash Flows

33. The cash flow projections used in the calculation of the best estimate should take account of all future cash in- and out-flows required to settle the insurance obligations attributable to the lifetime of the policy. This is defined to continue up to the point at which:

- a. the insurer is no longer required to provide coverage;
- b. the insurer has the right or the practical ability to reassess the risk of the particular policyholder and, as a result, can set a price that fully reflects that risk;
- c. the insurer has the right or the practical ability to reassess the risk of the portfolio that contains the contract and, as a result, can set a price that fully reflects the risk of that portfolio.

34. The cash flows expected to be taken into account in the valuation should be based on unbiased current estimates and would include:

- a. future best-estimate premium payments;
- b. benefit payments to cedants, policyholders, and beneficiaries, including an allowance for any discretionary benefits, e.g. ex gratia payments, or if certain contracts are designed with the right to participate in the performance of a specified pool of assets;
- c. expenses, including any payments to intermediaries, claim costs, and servicing costs;
- d. investment costs, (as discounting is carried out with a yield curve with no adjustment for investment expenses);
- e. payments to and from reinsurers or other providers of risk mitigation, including reinstatement premiums; and
- f. other cash flow items which are expected to be charged to policyholders or required to settle the obligations.

35. The expenses referred to in point 34c. above include all costs incurred in servicing all recognised insurance obligations over their lifetime. This should include:

- a. Administrative expenses
- b. Claims management expenses
- c. Acquisition expenses
- d. Overhead expenses included in the expenses mentioned above. Overhead expenses include, for example, salaries to general managers, auditing costs and regular day-to-day costs for utility bills, rent and IT costs. These overhead expenses also include expenses related to the development of new insurance business, advertising and improvements of the internal processes such as IT systems and software.

36. Where an insurer has committed to write a policy with an inception date after the valuation date, and the terms of that policy cannot be changed unilaterally by the insurer, then

that policy should be included in the best estimate – this is often referred to as ‘bound but not incepted’ (“BBNI”) business.

37. The insurer should disclose the amount of the premium included as BBNI business, along with the technical provisions determined for this business, in a supplementary note to the EBS.

iii. Management actions / Policyholder behaviour

38. The best estimate should take into account potential management actions and potential changes in policyholder behaviour. The size of the best estimate could be influenced by the policyholder’s decision to exercise options open to him as well as management’s ability to exercise its discretion.

39. Management actions should be reflected in the valuation of the best estimate provided that the management actions:

- a. are clearly documented;
- b. have been approved by senior management;
- c. are consistent with representations made to policyholders;
- d. are realistic and consistent with the insurer’s current business practice and business strategy;
- e. reflect the time and cost required to implement; and
- f. are consistent with past evidence of similar actions in similar circumstances.

40. Policyholder behaviour should reflect:

- a. analysis of previous data on policyholder actions, if available;
- b. analysis of the degree to which it would be in the policyholder’s interest to exercise the available option;
- c. changes in the operating environment, e.g. if the level of guarantees is increasing in the market then policyholders are more likely to lapse and purchase a new product (and vice versa); and
- d. potential interaction with management actions.

41. The analysis of policyholder behaviour (which includes the possibility of recaptures for reinsurance transactions) should be prospective, thereby requiring some degree of expert judgment.

iv. Guarantees and contractual options

42. When calculating the best estimate, the insurer or insurance group should identify and take into account all material guarantees and contractual options included in the insurance policies.

- a. The value of options and guarantees would be influenced by the prevailing economic conditions and the likelihood of the policyholder to exercise the option.
- b. In order to properly value financial options, the insurer would typically need to examine a number of different scenarios.
- c. For the simpler and less material options, the analysis may be based on simplified methods, such as closed form solutions or the analysis of selected scenarios. However, for more complex and material options, a range of stochastic scenarios may be required.
- d. For valuation purposes, the stochastic scenarios used are typically calibrated to market prices.

v. Taxation

43. In determining the best estimate, insurers should take into account taxation payments which are, or are expected to be, charged to policyholders or are required to settle the insurance obligations. The following tax payments should be included in the best estimate: transaction-based taxes (such as premium taxes, stamp duties, value added taxes and goods and services taxes) and levies (such as fire service levies and guarantee fund assessments) that arise directly from recognised insurance contracts. Assessments which are already included in other expense assumptions (such as levies to industry protection schemes) should not be included. All other tax payments should be taken into account under other balance sheet items.

vi. Calculation of Technical Provisions as a Whole

44. Where future cash flows associated with insurance obligations can be replicated reliably using financial instruments for which a reliable market value is observable, the value of technical provisions associated with those future cash flows should be determined on the basis of the market price of those financial instruments. In this case, separate calculations of the best estimate and the risk margin should not be required.

45. For the purpose of determining the circumstances where some or all future cash flows associated with insurance obligations can be replicated reliably using financial instruments for which a reliable market value is observable, insurers should assess whether all the criteria set out in both the following two paragraphs are met. In this case, the value of technical provisions associated with those future cash flows should be equal to the market price of the financial instruments used in the replication. It may be necessary to separate a policy into two or more components ('unbundling') to be able to satisfactorily identify liabilities for this purpose, with some parts valued 'as a whole' and others where a best estimate is calculated.

46. The cash flows of the financial instruments should replicate the uncertainty, in amount and timing, of the cash flows associated with the insurance obligations, in relation to the risks underlying the cash flows associated with the insurance obligations in all plausible scenarios. The cash flows of the financial instruments must provide not only the same expected amount as the cash flows associated with the insurance obligations, but also the same pattern of variability. The following cash flows associated with insurance obligations cannot be reliably replicated:

- a. Cash flows associated with insurance obligations that depend on the likelihood that policyholders will exercise contractual options, including lapses and surrenders;
- b. Cash flows associated with insurance obligations that depend on the level, trend, or volatility of mortality, disability, sickness and morbidity rates;
- c. All expenses that will be incurred in servicing insurance obligations.

47. To be used in the replications, the financial instruments should be traded in active markets, and satisfy the following criteria:

- a. A large number of assets can be transacted without significantly affecting the price of the financial instruments used in the replications.
 - b. Assets can be easily bought and sold without causing a significant movement in the price;
 - c. Current trade and price information are readily available to the public and in particular to the insurer.
48. The Authority expects to provide further guidance on when calculation of technical provisions as a whole may be acceptable.

vi. Reinsurance recoveries

49. The best estimate of reinsurance recoveries should be based on principles similar to, and consistent with, those underlying the gross best estimate. Relevant cash flows to be considered for the best estimate may extend to include reinstatement premiums required to be paid to the reinsurer, and will include expenses in relation to the management and administration of reinsurance claims.

50. Where recoveries from reinsurers are not dependent directly on gross claims payments, e.g. they are dependent on some type of index or other trigger, then the insurer will need to take into account any structural mismatch between gross claims payments and amounts recoverable (basis risk) in determining their best estimate.

51. Insurers should consider the potential impact of timing differences between payment of gross claims and receiving related recoveries from reinsurers.

52. The best estimate of reinsurance recoveries should be adjusted to reflect expected losses due to counterparty default (for whatever reason, including reinsurer insolvency and contractual disputes). The adjustment should be shown separately as part of supplementary notes to the EBS. It should be based on an assessment of the probability of default by the counterparty and the average expected loss should the default occur. Where the insurer is holding collateral against potential recoveries, then this can be taken into account to reduce the adjustment that would otherwise be needed. Where specific assets / investments form part of the collateral, then

the ratings for those instruments should be taken into account rather than the rating for the reinsurer. Where a letter of credit is involved, then the rating of the letter of credit issuer should replace that of the reinsurer in the assessment.

53. The insurer should disclose the amount of the discount adjustment applied to the outstanding claims best estimate in a supplementary note to the EBS.

vii. Risk free discount rates and adjustments

54. The risk-free yield curve is based on swap rates that are adjusted down by 10bp to reflect credit risk and that are extended to a duration of 100 years to a specified ultimate forward rate (UFR). It is proposed that this curve be provided annually by the BMA for eight major currencies (USD, CAD, GBP, CHF, EUR, JPY, AUD, and NZD). The precise method will also be published so that companies will be able to generate the curve on interim dates (such as quarterly) for internal purposes. The method has been selected to be fully automated (with all parameters disclosed) to facilitate this. Refer to the Appendix for further details.

55. It is further proposed to permit insurers to use one of two options to adjust the risk-free yield curve; a 'Standard approach' and a 'Scenario-based approach'. The Standard approach would be available to all insurers, and aims to allow some recognition of the illiquidity premium as well as preventing pro-cyclical investment behaviour by mitigating the effect of exaggerations of bond spreads. The Scenario-based approach is designed to allow insurers that have assets that are closely matched to their technical provisions to reflect the yields available on their assets, with suitable adjustments for credit spreads. In order to avoid changes in asset spreads from impacting on the amount of available eligible capital, insurers should be allowed to adjust the risk-free rate in line with the spread movements of their assets that are not related to changes in expected default/migration costs. The approach has been designed to be flexible in operation, and also to give partial credit when full asset liability matching has not been achieved. Further details can be found in the Appendix.

viii. General business insurance technical provisions

56. The best estimate shall be shown separately for outstanding claims provisions (in respect of claims incurred whether reported or not) and premium provisions (in respect of expected future claims events). The best estimate of reinsurance recoveries shall also be shown separately for outstanding claims and premium provisions.

57. Although segmentation of the business for the purposes of calculating best estimates is left to the insurer's discretion, insurers will need to produce best estimate outstanding claims for calculating the BSCR.

ix. Outstanding claims

58. For outstanding claims, the best estimate should reflect cash flows related to claim events that have already occurred, whether these have been reported to the insurer or not. They should also include allocated and unallocated loss adjustment expenses, and related investment expenses.

59. Where an insurer has settled a claim and is making a series of payments over the lifetime of a claimant (e.g. as part of a periodic payment settlement of an injury claim), and the insurer is managing the claim using techniques similar to those usually employed by Long-Term insurers for pay-out annuity business, then the insurer may elect to establish best estimate provisions for the outstanding claims for this business in a similar manner to a Long-Term insurer, including use of the 'Scenario-based approach' to determine the appropriate adjusted risk-free discount curve, if appropriate.

60. The Authority recognises that certain GAAPs already have a requirement that technical provisions be stated at (undiscounted) best estimate levels. Although the definition of 'best estimate' may not be precisely the same as the definition stated in the Authority's EBS framework, it may still be acceptable to set the EBS best estimate by discounting the existing GAAP technical provision, providing that there are no margins for prudence included, and additional appropriate allowance is made for investment related expenses.

61. The insurer should disclose the amount of the discount adjustment applied to the outstanding claims best estimate in a supplementary note to the EBS.

x. Premium provisions

62. For premium provisions, the best estimate should reflect the following cash flows:

- a. Cash flows from future premiums falling within the contract boundary;
- b. Cash flows resulting from future claims events (taking into account the potential for claims that have very high severity but with a low probability of occurrence);
- c. Cash flows arising from allocated and unallocated loss adjustment expenses;
- d. Cash flows arising from ongoing administration of the in-force policies, including any commission payments and investment related expenses.

63. It is noted that the present value of cash in-flows may exceed the expected present value of cash outflows for premium provisions, particularly at the early stages of a policy that is expected to be profitable. This would result in a negative amount for premium provisions – this is an acceptable situation, and there is no need to eliminate such negative amounts.

64. It may be appropriate for the premium provision to be derived using approximations based on the existing GAAP unearned premium reserve (“UPR”), allowing for a premium deficiency reserve where appropriate:

- a. One approximation might be to apply expected future loss ratios and expense ratios to the UPR to derive some of the components of the premium reserve, and then to apply appropriate claims pay-out patterns to derive cash flows for discounting. Care would be needed over the choice of relevant future loss and claims ratios. Relevant ratios forming part of next year’s business plan may well also cover future business written after the valuation date on different premium rating strength and terms and conditions, and so will need further adjustment for use for premium provision calculations.
- b. An alternative simplification might be to take the existing UPR (together with any premium deficiency reserve) and deduct the existing GAAP deferred acquisition costs (DAC). The discounted value of expected future premiums would also be

deducted. There would be no further discounting of claims payments, or addition of investment expenses, as these are implicitly included in the UPR amount. It should be noted that this approximation may well result in an over-estimation of the true premium provision, which could be material for some lines of business.

65. Where approximations have been used for outstanding claims or premium provisions, there should be an appropriate supplementary note disclosure, and the Loss Reserve Specialist / Approved Actuary / Group Actuary Opinion would need to explain why the approach adopted is considered reasonable / appropriate.

xi. Long-Term insurance technical provisions

66. The cash-flow projections used in the calculation of best estimates for Long-Term insurance obligations shall be made separately for each policy. Where the separate calculation for each policy would be a burden on the insurer, it may carry out the projection by grouping policies, provided that:

- a. There are no significant differences in the nature and complexity of the risks underlying the policies in the same group
- b. The grouping of policies does not misrepresent the risk underlying the policies and does not misrepresent their expenses
- c. The grouping of policies is likely to give approximately the same results for the best estimate calculation as a calculation on a per policy basis, in particular in relation to financial guarantees and contractual options included in the policies.

67. In certain circumstances the best estimate element of technical provisions may be negative (e.g. for some individual contracts). This is acceptable and insurers should not set to zero the value of the best estimate with respect to those contracts.

68. No implicit or explicit surrender value floor should be assumed for the amount of the market consistent value of liabilities for a contract. (e. g. if the sum of a best estimate and a risk margin of a contract is lower than the surrender value of that contract, there is no need to increase the technical provision to the surrender value of the contract).

xii. Risk Margin

69. Technical provisions include a risk margin, in addition to the best estimate, to reflect the uncertainty associated with the probability-weighted cash flows. Whilst in principle, the best estimate reflects the amount required on average to meet policyholder obligations, the insurer will also need to hold additional funds to meet those situations where cash flows exceed those expected. The risk margin should reflect the compensation that the insurer needs to bear this risk.

70. The risk margin should meet the following characteristics:

- a. The greater the uncertainty associated with the cash flows, the larger the risk margin;
- b. Risks which are more material, all else being equal, will result in a larger risk margin;
- c. Risks which persist for longer, all else being equal, will result in a larger risk margin;
- d. Similar risks should give rise to similar risk margins.

71. The risk margin may be calculated at an aggregate level for general business and for Long-Term business. It should be calculated net of reinsurance. For general business, the risk margin should not be calculated separately for premium and outstanding claims provisions.

72. The Authority is proposing that the Cost of Capital approach should be used.

- a. The cost of capital rate to be used is 6%;
- b. The calculation should reflect Bermuda regulatory capital requirements; i.e. the enhanced capital requirement (ECR) – which may be calculated using the BSCR or an approved internal model;
- c. The assessment should cover the full period needed to run-off the insurance liabilities, and be discounted using the risk-free discount curve;
- d. The risks to be taken into account are insurance risk, credit risk, operational risks and market risk in respect of assets, sufficient to cover the best estimate, that are

classified as ‘held to maturity’ or are otherwise held to qualify for adjustments to the risk free discount rate;

- e. The insurer may take credit for diversification between lines of business and risk types consistent with the assumptions underlying the BSCR model (or their approved internal model) when calculating the risk margin;

73. To assist with the earlier trial runs, the Association of Bermuda Insurers and Reinsurers (ABIR) had produced a template to assist insurers with the calculation of the Risk Margin for Property & Casualty business using certain approximations. It is anticipated that such templates, which insurers may find helpful in calculating the Risk Margin, will continue to be made available to insurers, and would also be extended to include Long-Term business.

C. Implications for BSCR

74. The BSCR calculations will, in future, be based on the EBS and the capital requirements calculated will be compared against available eligible capital (based on the EBS). This means that there will be some consequential changes to the statutory rules to ensure that references to assets, premiums, reserves and available capital in the BSCR refer to the EBS. As the EBS will be prepared on a consolidated basis, in order to ensure that the Authority will continue to be aware of activity within Bermuda operations, there will be some additional disclosures needed on a non-consolidated basis related to premiums, elements of technical provisions, and assets.. This approach is consistent with requirements currently imposed on insurers that file a consolidated BSCR with the Authority. These proposed changes are reflected in the draft legislation.

75. Since the technical provisions under EBS may be different in magnitude to current insurance reserves, it may be necessary to consider a recalibration of elements of the BSCR relating to reserves. Preliminary outcomes from earlier trial runs have not indicated a very significant reduction in technical provisions in most cases. Therefore, the Authority will defer any adjustment to reserve factors until a more substantive recalibration exercise can take place. As there has not been a trial run exercise for Long-Term business to date, the Authority has no information on the potential impact on reserves, and thus whether it will be necessary to adjust

factors to properly reflect the revised position. The need for such changes will be considered following the forthcoming trial run.

76. In addition, consistent with prior representations, the Authority proposes to proceed with other changes to the BSCR to address concerns over: the lack of a Currency risk and Concentration risk module; allowing credit for geographical diversification for General Business; and to increase the granularity and risk sensitivity of the charge on 'cash' assets. These will be the subject of a separate consultation exercise in Q1 2015.

D. Governance arrangements

77. The EBS is proposed to be included as part of the C&SR, which is not subject to an audit requirement. It is not currently proposed to change this approach. In order to obtain the necessary assurances that the submission is reliable, the Authority will need to place enhanced reliance on the insurer's governance arrangements for producing the EBS.. Parts of the EBS will be based on the GAAP balance sheet, which is subject to audit. It is also proposed that technical provisions will be subject to an approved actuarial opinion, which will replace the existing Opinion given as part of the current Statutory Financial Return (SFR). However, it is recognised that the amounts included in the EBS are the responsibility of management.

78. Insurers and insurance groups shall have effective systems and controls to ensure that valuation estimates of their assets, liabilities and technical provisions are appropriate and reliable.

79. The data used to support the production of the EBS should be relevant, complete and reliable. This includes policyholder data used in actuarial models and other data used to set the assumptions and parameters for the valuation (e.g. experience analyses and market information).

80. The insurer and insurance group should ensure that:

- a. Relevant data is not excluded from the valuation process without due justification;
- b. The data used is free from material errors;
- c. Data used from different time periods for the same estimation are consistent;

- d. Data used is up-to-date and consistent with the assumptions underlying the actuarial and statistical techniques that are applied to them in the valuation process;
- e. Data is available at a sufficient level of granularity and includes sufficient historical information to identify trends and assess the characteristics of the underlying risk;
- f. Data is credible for its intended use, e.g. in setting assumptions, and the insurer the sources and any limitations to the use of the data;
- g. The data appropriately reflects the risks to which the insurer is exposed;
- h. Where external data is used, the insurer understands the sources and any limitations of the data, and can justify why external data is considered more suitable than internal data.

81. Documentation sufficient to demonstrate that the above data quality standards are met should be maintained for supervisory review. A directory of all data used in the calculations of the technical provisions should be maintained and specify the source, characteristics and usage of data used in the calculations.

82. Insurers and insurance groups shall establish, implement and maintain clearly defined policies and procedures for the process of valuation of the EBS, including:

- a. The description and definition of roles and responsibilities of the personnel involved with the valuation;
- b. A validation between the extract data (e.g. policyholder or asset extracts) and the results of the valuation process. For example, confirmation that the premiums, face amounts and fund values from the policy extracts are consistent with the output of the actuarial models and other sources of information such as GAAP accounts;
- c. The actuarial and statistical methodologies for the calculation of the technical provisions;
- d. Determination of the assumptions, including the derivation of the various risk-free discount curves used;

- e. Parameterising and running the models underlying the valuation;
- f. Quality controls;
- g. The use of expert judgement;
- h. Documentation.

83. Certain aspects of the valuation processes will depend on the expertise of persons with relevant knowledge, experience and understanding of the risks inherent in the insurer's business. This may involve the use of expert judgement. In such cases, the insurer should document the use of expert judgement, and indicate steps it has used to validate the conclusions based on such judgements.

84. Insurers should validate the calculation of technical provisions at least once every financial year, or whenever there are indications that the data, assumptions or methods used in the calculation of the technical provisions are no longer appropriate.

85. Insurers should ensure that the persons overseeing the validation process are sufficiently qualified with regard to their knowledge and experience of the insurer's business, experience of carrying out validation processes and independent from the reserving process.

86. Given the absence of a specific audit requirement, in order to provide greater certainty for the Authority and its reliance on the EBS, it is proposed to make the EBS' technical provisions, including the Risk Margin, the subject of an actuarial Opinion (Loss Reserve Specialist, Approved Actuary or Group Actuary as appropriate). Based on the current SFR, this would replace rather than be in addition to, the existing Opinion. The full details of the Opinion's content will be the subject of a separate consultation process in 2015, but is likely to be similar in nature to the recently introduced Group Actuary's Opinion.

IV. TIMETABLE FOR EBS IMPLEMENTATION

87. Following the close of this consultation period, the Authority will review the responses provided and make adaptations to the EBS proposals as appropriate. The Authority then proposes to continue a series of trial runs during Q2 to test the proposals. After an assessment of the findings, including both financial implications and practical considerations, final rules will be made and are intended to come into force on 1st January 2016 for insurance groups and all commercial classes, except Class 3A insurers for which the rules will come into force on 1st January 2017.

88. It is intended that Class 3B and Class 4 general business insurers and insurance groups will submit EBS results, on a best efforts basis, for reporting periods ending 31st December 2015. This will take place, along with their usual statutory reporting, in 2016 as part of a more extensive trial run to ensure that insurers are making satisfactory progress implementing EBS. Class 3A insurers will be strongly encouraged to submit an EBS, along with their usual statutory reporting, in 2016 and will be expected to submit a best efforts EBS for reporting periods ending 31st December 2016, along with their usual statutory reporting, in 2017.

89. It is intended that Class C, Class D and Class E insurers will also submit EBS results for reporting periods ending 31st December 2015, along with their usual statutory reporting, in 2016. This should include insurance technical provisions on current valuation principles. Additionally, valuations for insurance technical provisions on EBS principles should be submitted as supplementary information in 2016 on a voluntary basis, but this supplementary reporting should be included in 2017 and 2018 filings.

90. As previously noted, the full final rules for insurance groups with Long-Term insurance business and those Long-Term business insurers that also have a Class 3B or Class 4 licence (i.e. certain dual licensed entities) will come into force on 1st January 2016, including Long-Term technical provisions on a full EBS basis. These insurers and insurance groups will be expected to submit full EBS results, including Long-Term technical provisions on an EBS basis, for reporting periods ending 31st December 2015, along with their usual statutory reporting, in 2016.

91. Pre-implementation reporting would be on a “best-efforts” basis. It would not require management or board attestation/certification and serves as a “dry run” of the new EBS reporting framework. Prior to the implementation of formal regulatory reporting, this “parallel reporting” will provide both insurers and the Authority with experience and comfort with the new reporting standards.

92. Using the same implementation strategy, the framework will be extended to Class 3A insurers one year later than Class 3B and Class 4 insurers. At their earliest opportunity, Class 3A insurers are invited to discuss with the Authority any proposals for applying proportionality in the adoption of the EBS framework (e.g. outlined in paragraph 11c. of this paper).

93. During the trial run and dry run phases of implementation, insurers will be expected to aim for an economic valuation on a best-efforts basis. The Authority recognises that some reliance will need to be placed on approximations. When formally introduced to statutory reporting, a full economic valuation should be the goal of insurers, but this will of course be subject to the principle of proportionality. The Authority will retain the power to modify reporting requirements in exceptional cases.

94. The Authority realises that for some insurers, the move to the EBS may involve additional effort and is likely to iteratively develop over time. Insurers are encouraged to discuss their plans for the development of the EBS with their assigned supervisory contact at the Authority.

95. As part of the transitional arrangements in preparing the EBS, insurers would be permitted to leverage existing systems, processes, and capabilities to meet current reporting requirements to the extent reasonable and practicable.

96. It is proposed that the Authority provide a standard risk-free rate curve, at each year-end, of adequate duration for the discounting of cash flows. If circumstances necessitate, the scope of currency coverage may be widened or rates produced at different dates. The Authority will also

provide adjusted risk-free rate curves incorporating the ‘Standard approach’ adjustments – see paragraph 55 and section B of the Appendix. Insurers may use alternative rates, as long as the insurer can provide a rationale for such an approach and evidence that this is consistent with the principles as set out in the Appendix. Situations where approval will normally be granted will include permission to use risk free curves produced by other regulatory bodies (e.g. EIOPA for use in Solvency II) and for currencies where the Authority has not provided a standard curve. Permission to use other rates should be sought in advance.

**TABLE 1: GENERAL BUSINESS AND INSURANCE GROUPS ECONOMIC
BALANCE SHEET TIMETABLE**

TASK	DATES	COMMENTARY
Publish Consultation Papers (“CPs”) and Draft Prudential Rules for Class 3A, Class 3B, Class 4 insurers and Insurance Groups	31/12/14	The CP will describe the EBS Framework, which will be embedded in the Capital and Solvency Return. The EBS Schedules will contain the appropriate instructions and explanatory notes which will guide general business insurers and insurance groups from converting the GAAP financial statements into an economic balance sheet.
Consultation Period & Industry and Stakeholder Meetings	01/01/15-30/01/15	The Authority will conduct meetings with industry during the consultation period to explain its approach, explain the draft prudential rules.
Review Stakeholder comments	01/02/15-31/03/15	The Authority will review stakeholders’ comments (if any) and address any material concerns (if any). This process will entail publishing a stakeholder feedback letter and a formal advice of the EBS framework.
Quantitative Impact Assessment	01/04/15-29/05/15	The Authority will launch its final assessment based on the draft prudential rules to test the EBS requirements, assess insurers’ state of readiness to implement the EBS framework and address possible implementation/systems issues.
Analysis of Quantitative Impact Assessment submissions	01/06/15-30/06/15	The Authority will analyse the results to ensure: the market complies with the requirements; the results demonstrate that the industry can meet the regulatory capital requirements; finalisation of any legislative drafting items.
Publish Prudential Rules for Class 3A, Class 3B & Class 4 insurers and Insurance Groups	01/07/15	The Authority will publish the prudential rules in their final form which will come into operation not less than 180 days from the date of publication. These rules will come into effect on 1 st January 2016.

Implementation Date for Class 3B & Class 4 insurers and insurance groups	01/01/16	
Implementation Date for Class 3A insurers	01/01/17	The Authority will encourage Class 3A insurers to adopt EBS earlier than 1 st January 2017.
Proposed submissions by licensed insurers		
	April 2016	Dry run submissions of EBS by Class 3B / 4 (and Dual Licensees)
	May 2016	Dry run submission of EBS by Groups
	April 2017	Full 'live' submission by Class 3B / 4 (and Dual Licensees) plus dry run submission by Class 3A
	May 2017	Full 'live' submission by Groups
	April 2018	Full 'live' submission by Class 3A

TABLE 2: LONG-TERM BUSINESS INSURERS ECONOMIC BALANCE SHEET TIMETABLE

TASK	DATES	COMMENTARY
Publish Consultation Paper (“CP”) and Draft Prudential Rules for Class C, Class D and Class E insurers	31/12/14	The CP will describe the EBS Schedules, which will be embedded in the Capital and Solvency Return, and reflected in the prudential rules. The EBS Schedules will contain the appropriate instructions and explanatory notes which will guide the Long-Term business insurers from converting the GAAP/IFRS financial statements into an economic balance sheet.
Consultation Period & Industry and Stakeholder Meetings	01/01/15-30/01/15	The Authority will conduct meetings with industry during the consultation period to explain its approach and the draft prudential rules.
Review Stakeholder comments	01/02/15-31/03/15	The Authority will review stakeholders’ comments and address their concerns. This process will entail publishing a stakeholder feedback letter and refining the draft prudential rules.
First Quantitative Impact Assessment	01/05/15-30/06/15	The Authority will launch its assessment based on the draft prudential rules to test the EBS requirements and address implementation issues insurers may have.
Analysis of Quantitative Impact Assessment submissions	01/07/15-31/08/15	The Authority will analyse the results to ensure: the market complies with the requirements; the results demonstrate that the industry can meet the regulatory capital requirements; finalisation of any legislative drafting items.
Publish Prudential Rules for Class C, Class D and Class E insurers	30/09/15	The Authority will publish the prudential rules in their final form which will come into operation not less than 180 days from the date of publication of the draft prudential rules. These rules will come into effect on 1st January 2016 with transitional provisions (see exception below) .
Implementation Date for Class C, Class D and Class E insurers with transitional	01/01/16	Long-Term insurers will report on an EBS basis except for the technical provisions, which will be

provisions		implemented on 1 st January 2018. The technical provisions will be reported on the current valuation basis and the Authority will conduct field tests to facilitate the phasing in of the technical provisions being reported on an EBS basis.
Implementation Date for Class C, Class D and Class E insurers with a Class 3B or Class 4 insurer's licence (dual-licence insurers)	01/01/16	The prudential rules including Long-Term technical provisions will be fully effected on 1 st January 2016. Transitional provisions will not apply to these dual licence insurers.
Second Quantitative Impact Assessment	16/05/16 – 15/07/16	The Authority will launch the second assessment testing of the EBS requirements using 2015 year-end financials. Insurers will be allowed two months to complete and submit the assessment which will be due on 15 th July 2016. During this time, the Authority anticipates further market meetings and discussions with insurers as they work through the assessment.
Analysis of Quantitative Impact Assessment submissions	18/07/16 – 31/08/16	Similar to the first assessment, the Authority will analyse the results to ensure: the market complies with the requirements; the results demonstrate that the industry can meet the regulatory capital requirements; and to ascertain insurer's readiness to implement the EBS framework.
Third Quantitative Impact Assessment	01/04/17 – 31/05/17	The Authority will launch the third assessment testing the EBS requirements using 2016 year-end financials. Insurers will be allowed two months to complete and submit the assessment which will be due on 31 st May 2017.
Analysis of Quantitative Impact Assessment submissions and finalisation of prudential rules	01/06/17 – 30/06/17	Similar to the objectives of the second assessment, the Authority will analyse the results to ensure: the market complies with the requirements; the results demonstrate that the industry can meet the regulatory capital requirements; and to address any implementation/system issues.
Full implementation of EBS for Class C, Class D and Class E insurers	01/01/18	The EBS framework for Long-Term insurers (except for dual licence holders as noted above) will be fully

		implemented on <i>1st January 2018</i> .
Proposed submissions by licensed insurers		
	April 2016	Dry run submissions of EBS (current technical provisions) by Class C / D / E plus best efforts EBS technical provisions
	April 2017	Full 'live' submission of EBS (current technical provisions) by Class C / D / E plus dry run / best efforts EBS technical provisions
	April 2018	Full 'live' submission of EBS (current technical provisions) by Class C / D / E plus dry run / best efforts EBS technical provisions
	April 2019	Full 'live' submission of EBS (EBS technical provisions) by Class C / D / E

V. TRANSITIONAL MEASURES

97. In order to support the industry's transition to an EBS, the Authority is considering a range of possible arrangements to help insurers leverage existing systems, processes, and capabilities. These are intended to support insurers in the early stages of the transition to an EBS, although it is clearly acceptable if insurers wish to move forward faster in their efforts to comply with the stated principles and guidance.

98. The Authority requested assistance from the Association of Bermuda Insurers and Reinsurers' ("ABIR") Economic Balance Sheet Working Group ("Working Group") to draft recommendations on an EBS framework that would be consistent with IAIS standards and be appropriate for the nature of the Bermuda insurance market. The Working Group produced a paper that was submitted to the Authority, entitled *Proposed Template Economic Balance Sheet – Liabilities*, dated 31st May 2012. Many aspects of this paper remain consistent with the principles set out in the Consultation Paper.

99. The Authority explored transitional arrangements for the technical provisions and the risk margin with the Working Group. This consisted of a simplified approach for determining outstanding claims provisions based on applying discounting techniques to current undiscounted reserves (adjusted to remove any prudential margins as needed).

100. For premium provisions, the approach would be based on taking the existing unearned premium reserve (plus any premium deficiency reserve), and adjusting for existing deferred acquisition costs (DAC), as well as allowing for expected future premium (and reinstatement premium) payments. At the present time, this work does not extend to consideration of the allowance needed in premium provisions for bound but not incepted (BBNI) business. Note that this approach for premium provisions will result in an overestimation, which could be material for certain types of business. The transitional arrangements also include a simplification for the risk margin calculation.

101. While the Authority would encourage insurers to produce technical provision assessments that are as accurate and robust as possible, for the purposes of the transitional arrangements, the Authority is content for insurers to adopt simplified approaches.

102. At this stage, similar templates have not been created to cover Long-Term business, and the Authority intends to work with the Bermuda International Long-Term Insurers and Reinsurers group (BILTIR) to assist with the development of such templates.

103. In line with the Solvency II transitional measures that allow for certain technical provisions to be transitioned from current valuation approaches to the proposed EBS approach, the Authority will provide a similar option for certain types of business to allow for a 20-year transitional period. The use and amount of the transitional measures will be subject to prior supervisory approval.

104. At the level of homogeneous risk groups, insurers may apply a transitional deduction to technical provisions. A homogeneous risk group encompasses a collection of policies with similar risk characteristics. The transitional deduction shall correspond to a portion of the difference between the technical provisions as determined on the EBS basis and technical provisions determined on the basis in effect before EBS. The maximum percentage deductible shall decrease linearly at the end of each year, from 100% during the first year following its application, to 0% as of 20 years after that date. Such technical provisions shall be determined after deduction of amounts recoverable from reinsurance contracts and special purpose vehicles.

VI. APPENDIX

A. Risk Free rate

105. The risk-free yield curve is based on swap rates that are adjusted down by 10bp to reflect credit risk and that are extended to a duration of 100 years to a specified ultimate forward rate (UFR). It is proposed that this curve be provided annually by the BMA for eight major currencies (USD, CAD, GBP, CHF, EUR, JPY, AUD, and NZD). The precise method will also be published so that companies will be able to generate the curve on interim dates (such as quarterly) for internal purposes. The method has been selected to be fully automated (with all parameters disclosed) to facilitate this.

106. It is proposed that the UFR be set at a single rate across all currencies in recognition of the difficulty of projecting national differences over such a long time span.

- a. The UFR will be set at 4.8%, however, this may be reconsidered once testing is complete and we are able to determine its impact on Bermuda's particular mix of business;

107. It is anticipated that the UFR may be recalibrated from time to time if there is a material change in Long-Term expectations (such as occurred between the 1970's and the present date).

108. Interest rate swaps that cover a period no longer than a specified duration (the last liquidity point (LLP)) are used to develop the yield curve, however, in recognition of the fact that the swap market is thin in certain jurisdictions, sovereign bonds are first used to establish the smooth shape of the curve before it is adjusted using the swap spreads.

109. It is proposed to set the LLP equal to 30 years for all currencies except for the Euro (where 20 years will be used to provide consistency for companies that operate in Europe). Once testing is complete, we may consider other durations for different currencies.

110. The steps for producing each yield curve are as follows:

- a. Sovereign bond prices as of the specified date (31st December) are input to a Nelson-Siegel-Svensson process with a pre-specified beta parameter (the UFR). This results in a preliminary yield curve of spot rates extending to 100 years where the corresponding year 100 forward rate is equal to beta.
- b. Spreads of the selected swaps over the preliminary yield curve are calculated and smoothed using a linear regression (selected for its simplicity).
- c. The resulting spreads at duration 1, and LLP are combined with a zero spread at duration 100 and then smoothed and interpolated using cubic splines.
 - This method seems to provide reasonable results while matching first and second derivatives at the LLP. A minor disadvantage is that it can create a small bias in the spreads.
- d. The smoothed and interpolated spreads are adjusted down to reflect a 10bp credit spread and added to the yield curve from the first step.
- e. A final linear adjustment is applied to the spot rates between the LLP and year 100 to ensure that the final UFR is equal to the pre-specified value.

B. Standard approach

111. In recognition of the fact that a significant number of insurers have the kinds of liabilities that are heavily correlated with interest rate movements, and that in practice these liabilities are often not fully liquid, it is proposed that companies be permitted to include an adjustment to the risk-free rate to partially reflect the illiquidity premium implicit in the underlying assets held and to avoid artificial volatility on their balance sheets. This also has the aim of preventing pro-cyclical investment behaviour by mitigating the effect of exaggerations of bond spreads.

112. Discount rates for this approach will be provided by the Authority for the same currencies as the risk-free rate. They will be determined as follows:

- a. The starting point will be the risk-free yield curve as already described.
- b. A liquidity adjustment will be added to these rates to reflect the fact that insurance liabilities are in practice not entirely liquid. This liquidity adjustment will be based on a hypothetical asset portfolio and will be reduced to reflect the cost of defaults and multiplied by an uncertainty margin.

- c. For simplicity, the hypothetical asset portfolio will be based solely on corporate bonds. It is proposed to use published bond indices where they are readily available. For currencies where liabilities are much smaller and such indices not as common, approximations may be used. The Authority is planning to use Barclays (formerly Lehman) bond indices for US bonds and iBoxx for Euros.
- d. The adjustment for cost of defaults and transitions will also be market-based where feasible.
- e. The uncertainty margin will likely be in the range of 60% - 70% and will be finalized during testing.

C. Scenario-based approach

113. Bermuda has a number of Long-Term insurers with a significant amount of highly bespoke reinsurance structures and asset portfolios. For these companies, the proposed standard approach may be too blunt an instrument to properly capture the market sensitivity of their business.

114. As a result, in many cases these insurers are not exposed to the risk of changing spreads on the assets that they hold, even if strict cash flow matching requirements have not been fully achieved. In order to avoid changes in asset spreads from impacting on the amount of capital, they should be allowed to adjust the risk-free rate in line with the spread movements of their assets that are not related to changes in expected default/migration costs. Therefore, the Authority proposes to permit the use of an alternative scenario-based approach that is designed to capture both the sensitivity to interest rates and the degree to which the assets and liabilities are cash-flow matched:

- a. The scenario-based approach uses the actual portfolio of assets assigned to the block of business (as well as any projected reinvestments) to determine market yields net of default costs.
- b. A set of interest rate stresses are then applied to determine the amount by which the market yields must be reduced to reflect interest rate risk and asset-liability mismatching. The resulting interest rate curve is used to calculate the reserves.

- c. Where the assets and liabilities are perfectly matched with no reinvestment required, the stress scenarios would have no impact and this approach in effect defaults to something similar to the Solvency II Matching Adjustment.
- d. Specifics of the method (including proposed calculation details) are provided below.

115. The Authority will provide a set of interest rate stresses that have been calibrated to produce economic reserves at a specified level (such as CTE70).

- a. These stress scenarios will cover a number of different interest patterns (such as increasing, decreasing, increasing and decreasing, twists where the long and short term rates behave differently, etc.)
- b. The specific stress scenarios will be finalised once testing has been completed.

116. The reinvestment assumption will reflect the company's investment guidelines and will be considered as part of the Approved Actuary Opinion and also be disclosed in an actuarial memorandum to accompany the submission. It is anticipated that the actuarial memorandum will incorporate a number of other pieces of information, including an assessment of the extent of asset liability matching in the portfolio.

117. The calculation steps would be as follows:

- a. The insurer selects assets from its investment portfolio and determines the internal rate of return (IRR), derived from the market value of those assets and the cash flows from them, adjusted for expected defaults / migration and the margin for defaults / migration. The quantum of assets selected should have a market value equal to the discounted value of the liability (and expense) cash flows discounted at the IRR. The IRR should be determined as a flat adjustment to the risk free curve at all durations.
- b. The insurer then tests the portfolio of assets and liabilities under each of the specified stress scenarios, and determines which scenario is the most adverse.

This testing is done by using the accumulated surplus approach. This approach requires determining the net cash flow each period, and rolling them up at the risk free rate – the net cash flow at any duration is the asset cash flow as adjusted for both expected defaults / migration and the margin for defaults / migration, less the best estimate liability cash flow for that duration. Under those scenarios where there is a net deficit by the time the last liability cash flow has occurred, then more of the insurer's own assets need to be added to the initial pool of assets in order to eliminate the deficit. The selected scenario is the scenario that requires assets with the highest market value. The market value of the assets is then effectively the final liability valuation.

c. Using the adjusted asset cash flows in step a. above, the insurer solves for the adjusted IRR that gives the market value of assets as derived in step b (again, as a flat adjustment to the risk free curve at all durations). This will be a lower percentage than the IRR determined in step a. The difference from the IRR derived in step a. is the 'mismatch adjustment'.

d. The final liability value is then derived as the present value of the best estimate liability cash flows, discounted at the IRR determined in step c.

118. The Authority anticipates that different blocks of business will be evaluated separately for the purposes of determining the appropriate discount rate to be used.

119. The scenario-based method would not be available for blocks of business that fall below a certain level of matching, and the Standard approach would need to be adopted. An appropriate measure and threshold will be developed during field testing.