



BERMUDA MONETARY AUTHORITY

CONSULTATION PAPER

Proposed Enhancements to the Regulatory Regime and
Fees for Commercial Insurers

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The liquidity contingency plan should be regularly tested and enhanced through dry-run simulation exercises. The results of such testing should be reported to the relevant committee(s), subjected to appropriate challenge and integrated into decision-making.

Monitoring and Reporting

Reporting should be of the appropriate detail while capturing the key liquidity risk areas. It should be proportionate, forward-looking (e.g., through early warning indicators) and able to facilitate informed decision-making. An insurer should put in place appropriate infrastructure and systems to access relevant data and, thus, assess and monitor its liquidity exposures.

2.4. Lapse Risk³

The SBA is a dynamic approach that requires the modelling to be as close as possible to what happens in practice. For instance, actual asset sales and purchases need to be explicitly modelled and projected, dynamic lapses should be captured, and cashflows should respond to the particular interest rate scenario just as they would in practice. This feature allows the SBA to incorporate some of the asset and liability dynamics (e.g., those related to lapse risk and reinvestment) within the scenarios in a way that would not be possible under a static approach.

A major premise of the SBA is that when illiquid liabilities are matched with suitable fixed-income assets producing predictable and stable cash flows, it is appropriate to reflect the illiquidity premium embedded in the insurer's own asset yields in the discounting of those liabilities. The illiquidity premium in the wide sense (i.e., including complexity premium) corresponds to the part of the total asset spread that is not attributable to actual credit risk. Nevertheless, this also means that liabilities subject to convexity risk, despite having been historically illiquid, can quickly turn liquid (and hence payable) under rising interest rate environments.

³ Lapse risk charges for capital requirements are discussed separately under the BSCR's Computation section. Section 3.4 is only focused on the treatment of lapse risk within the SBA.

Lapse risk is one key contributor and has the potential to cause a breakdown of the matching assumed by an insurer, for example, by forcing the insurer to sell assets at unfavourable prices to meet increased liability outflows and/or cause losses if the cash surrender value is higher than the technical provisions held. While unexpected deviations in lapse risk should be and are handled as part of the capital requirements and the SBA is an approach to determine the best estimate value of liabilities, it is the Authority's view that more conservatism and guardrails should be in place on how this is applied in practice.

As a guiding principle of the proposed changes on lapse risk, within the SBA, the scope and impact of potential unexpected lapse deviations that would result in uncertainty in cashflows cannot be significant (i.e., liabilities subject to lapse risk shall be allowed only to the extent that the lapse risk arising from such is appropriately and prudently managed in the context of a robust ALM programme). The Authority does note that some insurers may have various mitigants in place to limit the extent and impact of lapse risk. The impact of such mitigants shall be considered only to the extent that it can be demonstrated to be satisfactorily effective, both quantitatively and qualitatively, as part of the insurer's overall ALM programme and liquidity risk management framework.

The Authority aims to ensure that the lapse assumption used in the BEL calculation is prudent where products subject to lapse risk are included. This implies that to qualify to use the SBA, insurers would need to demonstrate, both quantitatively and qualitatively, that the base lapse assumption is robust and gives prudent best estimates. In addition, it is vital that the dynamic nature of the SBA is reflected in the modelling of dynamic lapses and that their impact is separately identified and reported. Moreover, the Authority proposes introducing an adjustment to the base lapse assumption. The magnitude of this adjustment shall be a maximum of one standard deviation of the base lapse assumption. In more detail, the proposed changes are as follows:

For eligibility to use the SBA, insurers would need to satisfy one of the two conditions below:

1. The contracts underlying the insurance or reinsurance obligations include no options for the policyholder; or
2. Where policyholder options exist, the residual risk arising from asset/liability portfolios with such options is demonstrated to be not significant in the context of the risk management in place.

Demonstrating the residual risk arising from asset/liability portfolios with policyholder lapse options is ‘not significant’ in the context of the risk management in place:

The BMA recognises the complexity and very tailored nature of the Bermuda market and the variety of risk management approaches/techniques used by insurers to manage balance sheet risks. To demonstrate compliance, every affected insurer shall submit a detailed analysis to the Authority (i) to obtain initial approval to use the SBA and (ii) on an ongoing annual basis thereafter (e.g., as part of the annual report requirements). The analysis to be submitted as part of the enhanced SBA reporting shall include but not be limited to the following:

1. Details on results of stress tests:
 - a. A 40% lapse-up or lapse-down stress test representing a permanent increase or decrease in base lapse rates. The most conservative of the two stress tests shall be reported. An insurer should pass a 100% Enhanced Capital Requirement (ECR) ratio, and all excess cash outflows should be fully met by High-Quality Liquid Assets (HQLA) to be defined by the Authority;
 - b. Insurer-specific lapse stress tests shall also be considered for approval by the Authority if the insurer wishes to use a calibration specific to its business. Supporting details on why this is considered more appropriate, including an impact assessment on the liquidity position and ECR ratio, should be required. Insurers that are approved to use their own stress tests should still complete the BMA-specified stress tests;
 - c. A combination of a 20% mass lapse stress and stressed market values—reflected through BMA-specified haircuts (i.e., assess the impact on the liquidity position of the insurer being forced to sell assets under stressed market conditions to meet elevated liquidity demands due to a 20% mass lapse shock).

The combined mass lapse and asset stress should involve detailed and granular liquidity analysis of the key liquidity sources and needs and demonstrate that the insurer can withstand this scenario using available liquidity resources. All excess cash outflows under this stress test should be fully met using HQLA alone. Haircuts shall be applied to the HQLA. After the stress, an insurer should remain with enough assets to meet at least all the remaining policyholder liabilities in addition to meeting the liquidity requirements; and

- d. Cross-subsidisation of lapses between (homogeneous groups of) policies is not allowed in the calculation of the impact of the stress tests.
2. Demonstration that the liquidity risk management programme meets the minimum BMA specifications as described in section 2.3 above;
3. Details of the product design (e.g., lapse charges, market value adjustment, including assessment of the qualitative and quantitative impact of these on lapses);
4. Qualitative and quantitative details on how the lapse basis is set and the controls around this to manage the risk of loss on surrender. This could include:
 - a. Availability and credibility of data;
 - b. Specific measures of prudence adopted when data on surrender experience is limited or cannot be relied upon for whatever reason;
 - c. Experience analysis and assumptions update process;
5. Details on ALM (with specific details on lapse risk mitigation [e.g., liability convexity hedging]), including explicit quantification of relevant risk metrics under different insurer-specific scenarios.

The BMA will consider these results and information in determining an insurer's initial and ongoing eligibility to use the SBA.

Optionality assumptions in BEL calculation

Optionality assumptions such as lapses and all other rate-sensitive assumptions shall be appropriately modelled under all the SBA scenarios (e.g., through the use of dynamic formulas for lapses).

Base Lapse Adjustment (BLA) within the SBA calculation.

The Authority proposes to include an adjustment to the policyholder behaviour assumptions within the SBA calculation, in addition to the dynamic lapse assumptions captured through the existing SBA scenarios. The tentative proposal is that insurers follow the following process in calculating the BLA:

1. Calculate the BEL under the base and eight scenarios;
2. Identify binding scenario and binding scenario BEL;
3. Calculate the BEL using the binding scenario but with the base lapse assumption adjusted up/down (max one-standard-deviation range) such that there is no less than zero change in the BEL. Impact offsets between (homogeneous groups of) policies are not allowed. That is, when the lapse adjustment is applied, the BEL increases due to increased lapses should not be offset or reduced by the BEL decreases due to increased lapses, and a BEL increase due to reduced lapses should not be offset or reduced by a BEL decrease due to reduced lapses;
4. The BEL in 3 above is taken as the ultimate BEL number for reporting, clearly highlighting:
 - a. Impact on the BEL attributable to lapse change due to dynamic lapses under the binding scenario; and
 - b. Impact on the BEL attributable to one-standard-deviation change in base lapse under the binding scenario.

2.5. Assets with Optionalities or Behavioural Components

In general, assets used in the SBA should provide highly predictable and stable cash flows with no or extremely limited optionality. The existence of material options or behavioural sensitivities may render assets ineligible for the SBA, particularly where the effect of these cannot be prudently accounted for, as far as these result in asset cash flows being deemed not predictable or stable enough, as per the existing SBA instructions and guidance. In cases where, in the normal course of prudent investment, some optionality or behavioural components may reasonably exist (e.g., call options for corporate bonds or prepayments for certain mortgage-backed securities), all such features must be explicitly modelled. The resulting asset cash flows should differ between the SBA scenarios as appropriate. The

foregoing does not constitute a change (i.e., it is already a requirement). Nevertheless, additional disclosure will be mandated to make the assumptions more transparent and to enable the Authority to undertake better benchmarking, including the identification of potential outliers. The BMA is currently considering possible ways the disclosure could be implemented.

All the relevant assumptions (e.g., call, prepayment or other) should be explained and justified and will be subject to enhanced disclosure and sensitivity testing. The justification should include an appropriate comparison of prior experience to that reflected in the current (forward-looking) assumptions. Where material uncertainty exists, whether concerning (a lack of) historical data or uncertainty around the forward-looking behaviour, the assumptions should be set to reflect this uncertainty prudently. The sensitivity testing will look at the impact of changes in relevant assumptions (e.g., prepayment assumptions).

2.6. Restrictions on Assumed Asset Sales – Unsellable Assets

The concept of the SBA relies on insurers being able to collect the illiquidity premium embedded in asset yields by holding those assets to maturity. If a sale of the assets intended to be held to maturity was required, this would happen at an uncertain price dependent upon the market circumstances at the time. This uncertainty is magnified for less liquid and/or relatively more volatile/risky assets.

The Authority intends to clarify and set restrictions on what can be assumed regarding asset sales within the SBA projections. Specifically, no 258E assets should be assumed to be sold within the SBA projections ('unsellable assets'). It may be noted that insurers generally assume holding these assets to maturity in reality (i.e., this is an integral part of the business models), and this should be already reflected in the SBA modelling, assuming the modelling has been done appropriately. Therefore, the nature of this change is more to codify the appropriate practice rather than to introduce a new restriction per se.

The following is envisaged to apply:

1. No ‘unsellable asset’ should be sold to meet cashflow shortfalls. Where this is the case, the insurer should increase its holding of sellable 258C assets. Otherwise, a material mismatch exists, and the reserve should increase accordingly;
2. The SBA projections should end with zero surplus (zero assets and zero liabilities), meaning there should be no assets left. In terms of unsellable assets, this requires appropriate management of the investment portfolio: 258E assets (e.g., BB-rated bonds) reaching maturity should eventually be reinvested in sellable assets (rather than reinvesting in the same unsellable asset) in such a way to ensure that no sales of the unsellable assets are required within the projections;
3. In general, almost all the assets eligible for the SBA should have a fixed contractual maturity date. For the unsellable assets in this category, avoiding sales comes down to the appropriate management of reinvestments, as per the point above. In the exceedingly rare case of approved alternative assets with no fixed maturity date, an asset that is due to be sold would need to be replaced by a 258C eligible asset sitting under the surplus bucket; otherwise, the alternative asset will be assigned a ‘zero value’ on sale: In practice, this will require tracking and modelling the value of 258C eligible surplus assets within the SBA projections. Any required sale of a 258E asset due to run-off would then be deducted from the remaining value of eligible surplus assets (on the premise that the 258E is swapped into surplus, and the eligible surplus asset is sold instead). This could be done until no 258C eligible surplus remains in the projection. At this point further disposals of 258E assets would be assigned zero value.

2.7. Default and Downgrade Costs

The SBA is based on the premise that when illiquid liabilities are matched with suitable fixed-income assets producing predictable and stable cash flows, it is appropriate to reflect the illiquidity premium embedded in the insurer’s own asset yields in the discounting of those liabilities. The illiquidity premium in the wide sense (i.e., including complexity premium, etc.) corresponds to the part of the total asset spread that is not attributable to actual credit risk. Accordingly, this latter part of the spread must be excluded from the asset spreads used in the SBA. Nevertheless, the Authority recognises there are potentially

various approaches to determine the spread component attributable to credit risk (and hence the remaining illiquidity premium).

The BMA intends to clarify and standardise the calculation of ‘default and downgrade costs’ within the SBA. This is to ensure the appropriateness of the calculation and consistent application in light of divergent practices and magnitudes of spread reductions observed across the market. The BMA proposes to publish the default and downgrade costs for some asset types where data is publicly available and provide guiding principles for those assets where BMA approval will be required.

The default and downgrade costs will be reflected through a negative adjustment to the investment spread. Like the default costs, the downgrade costs would be based on long-term historical data and are, therefore, not expected to fluctuate significantly from one year to the next. The ultimate calibration for default and downgrade costs will need to be based on credible evidence (both quantitative data and qualitative information), which the Authority seeks to collect further and enhance through the consultation process. As such, the proposed approaches for default and downgrade costs at this point are tentative and will continue to be refined.

Assets for which the BMA publishes the default and downgrade costs

One potential approach the BMA is considering for assets with publicly available data is as follows:

1. Realised default losses from past data shall be used as a baseline for default costs; and
2. An uncertainty margin, calibrated to be no more than the one-standard-deviation range of the baseline default cost, shall be used as a downgrade cost estimate.

Assets for which the BMA has not published default and downgrade costs

Insurers seeking to use assets for which the BMA has not published the default and downgrade costs should, at a minimum, follow the approach being considered by the BMA as described above with the necessary adjustments. BMA approval shall be required for these assets.

Where default data is limited, the insurer shall consider taking an even more prudent approach, including but not limited to the following:

1. Ensuring the ultimate default estimate assumption proposed for use in the SBA is more prudent than that used for similar publicly quoted assets of comparable credit quality;
2. The ultimate default estimate assumption proposed for use in the SBA is no less prudent than that obtained using the approach proposed by the BMA as described above;
3. Conducting benchmarking analysis where applicable; and
4. For assets acceptable on a limited basis in line with paragraph 258E of the Guidance Note, the BMA shall consider if further measures of prudence are required. The BMA expects the uncertainty adjustment for the default cost on 258E assets to be not less than a 1.5 standard deviation of the baseline default costs. Other measures the BMA shall consider include but are not limited to:
 - a. Assessing a higher uncertainty adjustment than proposed by an insurer; and
 - b. Spread caps applied on a case-by-case basis.

Additionally, insurers may be required to demonstrate that only the spread premium that can be earned over the tenor of the asset is reflected in the BEL.

The chief actuary and chief investment officer shall attest to the prudence and appropriateness of the default assumptions submitted for approval to the Authority, including confirming compliance with regulatory requirements as outlined above.

2.8. Transaction Costs

Realistic transaction costs must be applied to all assets sold and bought within the SBA projections. Where historical transaction costs for an asset type may not be representative of expected future transaction costs, the assumptions should be adjusted accordingly, where that adjustment would lead to an increase in the transaction costs. Where there is a lack of credible data for a specific asset type or other uncertainty around the level of the assumptions, the assumptions should be set prudently.

For liquid publicly traded assets, a minimum requirement is to reflect observed bid-ask spreads, where it can be demonstrated that this adequately captures (and does not understate) the price impact. If current bid-ask spreads are lower than long-term average bid-ask spreads, a grading-in from current market to long-term average bid-ask spreads should be applied; the same shall apply if current bid-ask spreads are wider than long-term average bid-ask spreads, except that the grade-in period shall be set to be more prudent. This applies to both existing assets and potential reinvestments. The bid-ask spreads should be the effective bid-ask spreads that consider the size of the company's positions and the volumes traded in relation to the liquidity and depth of the market for the relevant asset; marginal bid-ask spreads (e.g., the bid-ask spread involved in buying/selling an incremental unit of quantity at market) should not be used.

Generally, for all assets, the full expected price impact of selling (or buying) the asset should be reflected within the SBA projections. This applies to liquid assets in case the market bid-ask spreads do not provide a full reflection of the price impact, but in particular, it applies to all less liquid assets. The impact is expected to vary by degree of (il)liquidity and between asset classes. For less liquid assets, the magnitude of the impact is expected to be higher than the bid-ask spreads based on advertised or displayed prices/quotes (including broker quotes or other non-binding prices). The transaction cost assumptions incorporating full price impacts should also not be lower for any asset type than the implied bid-ask spreads or discounts/premiums observed based on past actual trades for that asset type. The price impacts and bid-ask spreads for illiquid or less liquid assets should be no less than those for similar liquid publicly quoted assets of equivalent credit quality/rating.

In addition to the price impacts of trading, any applicable fees, commissions and expenses required to purchase or sell assets—whether implicit or explicit—should be included within the transaction cost assumptions.

Like all other assumptions in the SBA, these assumptions shall be subjected to internal challenge within the insurer, independently assessed by the approved actuary and reported to the Authority as part of the enhanced SBA reporting.

2.9. Affiliated Investments

Insurers generally fund long-term liabilities using investments in unaffiliated counterparties. The Authority proposes to require prior approval of all assets having counterparty credit exposure to an affiliate, related or connected party. In practice, such investments falling under Paragraph 258C of the Guidance Note will require prior regulatory approval on a going-forward basis.

2.10. Reinvestment and Disinvestment Strategies

While the principles for reinvestment and disinvestment listed below are reflected as proposed changes, the nature of this change is more to codify the appropriate practice and the Authority's expectations regarding reinvestment and disinvestment rather than to introduce a new change per se.

Reinvestment Strategy

In the SBA model, excess net cash flow can be reinvested. Reinvestment should reflect the key underlying SBA principle that the SBA is only to be used on asset-liability portfolios with a high degree of matching. Reinvestment assets can be purchased only in line with the insurer's existing and board-approved ALM and investment policies.

The following principles shall be observed in building and modelling the reinvestment assumptions:

1. Assumed asset purchases shall be made from a set of clearly defined asset classes in line with the insurer's current asset allocation and compliance with its ALM policy and investment policy asset allocation targets. The Authority does not envisage an insurer having an existing asset allocation that is not in line with its approved investment policy. Where such is the case, the most prudent approach shall be taken by default after discussion with the Authority;
2. While simplifications can be made to categorise some different non-standard assets into one bucket for reinvestment purposes, this should only be done as an exception, and

- even then, it should be clearly demonstrated that such simplification results in a more prudent BEL output than if no simplification had been made;
3. At a minimum, the list of assets from which purchases can be made should vary by rating and tenor within each asset class. The ratings should be at the appropriate level of granularity. While the tenor may be simplified into buckets, there should be no less than three buckets (i.e., short-term, medium-term and long-term maturities, each defined depending on the company's liability and asset cash flow profile). Exceptions should be discussed with the Authority before implementation;
 4. The asset purchase prices should be in line with the market values as projected under each scenario at a given time step for different asset classes for each combination of rating and tenor;
 5. While the reinvestment strategy and, hence, asset purchases, should be in line with the insurer's investment policy, these should not materially depart from the insurer's current asset allocation. Over the projection period, long-term historical market averages may be used; this, however, should be done prudently in the context of the performance of the insurer's existing asset portfolio. The grade-in period for moving from short-term spreads to long-term spreads should be set prudently, such that it is longer when short-term spreads are lower than long-term spreads and shorter when short-term spreads are higher than long-term spreads. Superior performance on the current portfolio cannot be assumed to continue over the projection period at variance with long-term historical market averages. All such assumptions shall be set robustly and critically, subjected to independent challenge and clearly documented as part of the internal governance process;
 6. To remove any doubt, asset types cannot be assumed to be purchased in the SBA model that the company does not already currently hold in its approved SBA asset portfolio;
 7. It should be demonstrated that the choice and implementation of the reinvestment strategy, and any simplifications thereof, result in a more prudent BEL output than would have been produced had the existing asset allocation been used for reinvestment purposes, with or without similar simplifications. This reflects the fact that spreads arising from the reinvestment strategy are not locked in, as with those from the existing asset allocation. A key underlying principle of the SBA is a high degree of cashflow

- matching. An insurer meeting this and other key principles would have a limited need for reinvestment. Where an insurer assesses that its reinvestment strategy does not fully meet this principle, a more prudent approach should be taken by default. Otherwise, the Authority's approval would be required; and
8. The Authority recognises that an insurer's reinvestment strategy can change from time to time in response to several internal and external factors. It is not the Authority's expectation that such changes should result in a material impact on the BEL. Where this is projected to be the case, the above principles should still be observed, including discussing the same with the Authority.

Disinvestment Strategy

An insurer should have a clearly defined disinvestment strategy aligned with its investment and other relevant policies. Within the SBA, assets shall only be sold for purposes of meeting excess liability cashflows otherwise not met through cash flows from asset maturities and coupon payments. A limited amount of selling related to portfolio rebalancing to maintain the existing asset allocation within existing duration limits over time is noted to be in the spirit of the underlying SBA principles. To remove any doubt, negative cashflows cannot be rolled forward in the SBA model.

An insurer's disinvestment strategy should, at a minimum, take the following into account:

1. The insurer's investment management practice regarding the order or sequential steps to follow when selling assets;
2. The insurer's investment management practice regarding the sale of assets before maturity;
3. The insurer's investment management practice regarding the sale of assets with unrealised losses;
4. The insurer's investment management practice regarding selling assets to cover liabilities denominated in currencies different from the asset sold;
5. The insurer's investment management practice regarding the selling of long-duration versus short-duration assets;

6. The assets classified as ‘unsellable’. To be clear, illiquid assets cannot be assumed to be sold in the model for the purposes of meeting liability cashflows;
7. Existing constraints for each block of business that govern whether its supporting assets can be used to settle cash flow shortfalls arising in other blocks of business;
8. That the assets to be sold must be compliant with regulatory guidance. For example, 258E assets cannot be assumed to be sold in the model. Even in the case where assets assumed to be sold are not explicitly disallowed, the insurer should be able to demonstrate that the associated price impacts and transaction costs are reflective of the liquidity (or lack thereof) of the asset; and
9. That the asset sale prices must be in line with the market values as projected under each scenario at a given time step for different asset classes for each combination of rating and tenor.

The chief investment officer (or another suitable and appropriate executive officer as agreed with the Authority) shall attest to both the reinvestment and divestment strategy modelled in the SBA model, confirming alignment with the insurer’s practices and declaring compliance with the insurer’s policies and the above principles.

2.11. Ring-Fencing Assets Backing the SBA BEL

The Authority proposes separate identification and reporting of assets backing the SBA BEL and a requirement that such assets shall not be used or pledged for any purpose other than meeting policyholder liabilities.

2.12. Model Documentation Requirements

The Authority proposes to update the Guidance Note by introducing model documentation requirements for the application of the SBA, with the details as follows:

1. Model documentation should allow a knowledgeable third party to understand the design and details of the model and form a sound judgment as to its compliance with regulatory requirements;
2. The documentation should provide a detailed description of the structure, scope, theory, data, assumptions, expert judgment, parameterisation, results, validation, model

- changes, model governance and model policies. Furthermore, the documentation should detail all the key software, external models (including their customisation), data and the reasons for their use;
3. The documentation should be appropriately structured, detailed, complete and kept up to date. Outputs of the model should be capable of being reproduced using the model documentation and all the inputs into the model;
 4. Insurers should have a model documentation standard (e.g., as part of supporting standards to the model risk management policy) that defines the approach to document various aspects of the model, such as roles, development, sign-off, update and review processes, and sets out mechanisms that ensure that the standard is adequately implemented;
 5. The documentation should be appropriately structured and may include an inventory of all the documents forming the model documentation;
 6. The documentation should identify the main limitations, simplifications and weaknesses of the model and conditions under which the model may not adequately determine the insurer's best-estimate liability and technical provisions;
 7. Thorough documentation applies to all model risk management activities, including but not limited to model development, implementation, testing, ongoing monitoring, review, validation and management deliberation on model risk reports with escalation to board committees, as necessary; and
 8. Model documentation should clearly show how the model for the BEL and technical provisions calculation interacts with other models (upstream and downstream models). This should help the insurer appreciate the scope of the individual risks connected to an insurer's model and the aggregate risks emerging from interactions or interdependencies among models, processes and data across the firm. Being able to map and understand the end-to-end processes may help spot places where risk management is weak or controls are lacking.

2.13. Data Requirements

The Authority proposes to update the Guidance Note by introducing data requirements for the application of the SBA, details as follows:

Insurers shall ensure that they have an approved data policy in place supported by documented internal processes and procedures to ensure data used in the calculation of technical provisions is complete, accurate and appropriate. This applies to all SBA data, including liability and asset data. More specifically, insurers should align their policy with the following:

1. Data used in the calculation of technical provisions should, at minimum, meet the following conditions to satisfy the completeness requirement:
 - a. The data includes sufficient historical information to assess the characteristics of the underlying risks and to identify trends in the risks; and
 - b. The data is available for each of the relevant homogeneous risk groups used in the calculation of the technical provisions, and no relevant data is excluded from being used in the calculation of the technical provisions without justification.
2. Data used in the calculation of technical provisions should, at minimum, meet the following conditions to satisfy the accuracy requirement:
 - a. The data is free from material errors;
 - b. Data from different time periods used for the same estimation is consistent;
 - c. The data is recorded in a timely manner and consistently over time; and
 - d. Data extensions, capping or modification should be documented and justified. The process for dealing with outliers and data-smoothing should be performed prudently such that there is no material underestimation of the technical provisions.
3. Data used in the calculation of technical provisions should, at a minimum, meet the following conditions to satisfy the appropriateness requirement:
 - a. The data should be consistent with the purposes for which it will be used;
 - b. The amount and nature of the data ensure that the estimations made in the calculation of the technical provisions based on the data do not include a material estimation error;
 - c. The data is consistent with the assumptions underlying the actuarial and statistical techniques that are applied to them in the calculation of the technical provisions;
 - d. The data appropriately reflects the risks to which the insurer is exposed as relevant to the technical provisions calculation;

- e. The data is used consistently over time in calculating the technical provisions. Where data is not used consistently over time, a description of the inconsistent use and its justification should be documented and disclosed in the SBA memorandum and approved actuary's opinion and report; and
 - f. The data is collected, processed and applied in a transparent and structured manner, based on a documented process that comprises all of the following:
 - i. The definition of criteria for the quality of data and an assessment of the quality of data, including specific qualitative and quantitative standards for different data sets;
 - ii. The use of and setting of assumptions made in the collection, processing and application of data; and
 - iii. The process for carrying out data updates, including the frequency and circumstances triggering additional updates.
4. Insurers may use data from external sources provided that, in addition to fulfilling the requirements set out above in paragraphs 1 to 3, all the following requirements are met:
- a. Insurers can demonstrate that the use of that data is more suitable than the use of data that is exclusively available from an internal source;
 - b. Insurers know the origin of that data and the assumptions or methodologies used to process the data;
 - c. Insurers identify any trends in that data and the variation, over time or across data, of the assumptions or methodologies in the use of that data;
 - d. Insurers can demonstrate that the assumptions and methodologies referred to in points (b) and (c) reflect the characteristics of the insurer's portfolio of insurance and reinsurance obligations; and
 - e. Insurers can demonstrate what other data could have been used, its impact and why it was not chosen. This also includes choices within the same data where a different choice could have been made.

Insurers should formally document the data controls in place and checks carried out on data used to calculate technical provisions and include an assessment of why the checks are considered adequate and appropriate.

2.14. Governance and Internal Control Requirements

The Authority proposes to update the Guidance Note by introducing governance and internal control requirements on the use of the SBA with the following details:

1. The board shall approve the initial use of the SBA and any major changes thereafter. Major changes should be defined in advance, or where not defined, a second-line opinion should be sought at the time of the change on whether the change requires board or board committee approval;
2. The board and management shall be responsible for ensuring the ongoing appropriateness of the design and operations of the SBA model and that the SBA model continues to be appropriate for the insurer;
3. There shall be an appropriate and suitably constituted committee(s) to effectively challenge new and ongoing model use, model and assumption change approval, and use and reporting of model output. Model validation reports should also be discussed at the committees' level;
4. The insurer shall implement policies to guide its model risk management activities as part of the overall risk management framework. At a minimum, an insurer shall have a model risk management policy and a data quality policy. The policies should cover all model risk management and data aspects, including but not limited to data storage and quality, model development, model testing, model use, model change, validation, documentation, model outsourcing, reporting and governance. Other documentation, such as standards, processes and procedures, could be considered, if appropriate and proportionate, to support the implementation of the policies;
5. Roles of the control functions shall be clearly defined concerning the development, use, ongoing maintenance, monitoring and review, validation and reporting of results and risks of the SBA model;
6. A mechanism to identify and prevent conflicts of interest shall be in place and addressed in the model's governance framework, including clear guidance on reporting lines, allocation of responsibilities and escalation paths within the insurer and to the Authority, as necessary;
7. Insurers shall ensure the systems, infrastructure and resources in place are adequate;

8. There shall be adequate and effective controls in place regarding the SBA model's operation and maintenance; and
9. Outsourcing of the process for running, maintaining and managing the SBA model is not encouraged. Nevertheless, where outsourcing is used either externally to third parties or internally to other affiliated entities, the insurer should have demonstrable oversight and clear accountability for all outsourced activities as if these were performed internally and subject to the insurer's own standards on governance and internal controls. Such outsourcing should be discussed with the Authority before implementation.

2.15. Model Risk Management

The Authority proposes to update the Guidance Note by introducing model risk management requirements on the use of the SBA. Model risk management activities shall be guided by the insurer's model risk management policy and supporting standards. The insurer should have a materiality definition specific to the use of the SBA model, which shall be developed in consultation with the control functions. The insurer's definition of materiality should determine whether model and assumption changes, enhancements, findings and other relevant considerations are material. The first and second-line functions should collaborate and ensure a clear definition and ownership for model risk management activities. This should be performed by considering the need for independence for some activities (e.g., validation). An attestation of the adequacy of the model risk management practices employed by the insurer, including compliance with the regulatory requirements in the areas below, shall be obtained from the chief risk officer and the chief executive officer.

Model Inventory

Insurers should maintain a comprehensive set of information as part of the model inventory in line with best-practice model risk management. This applies to the SBA models implemented for use, under development or recently retired and any associated downstream and upstream models (e.g., liability models, asset models or stress testing models).

Model Development, Testing, Implementation and Use

The model development and implementation processes should be structured and executed in a manner that is in keeping with the spirit and letter of regulatory guidance.

Software, computer code, algorithms, mathematical formulas and other information technology systems used to implement the model should undergo rigorous quality control and change control procedures even though they may not be considered models. This ensures that the code and its implementation are correct. It can only be edited by authorised parties and that all changes are recorded and auditable.

Testing is a crucial component of model development and should be conducted as part of the SBA model's lifecycle. Here, the many aspects of a model and its overall functionality are assessed to see if it is functioning as intended. This comprises determining the model's accuracy, proving its stability and robustness, identifying potential flaws, and analysing how the model responds to various inputs and scenarios.

Testing activities should include the goal, design, and execution of test plans and the summary results with commentary and evaluation, including a detailed analysis of samples. The documentation of test activities should be fit for purpose.

Model users can provide insight into whether the SBA models are functioning as intended, including assessing model performance as models are in use. Feedback should be sought on both the SBA model and the associated upstream and downstream models, as these are connected in their impact. Insurers should ensure adequate processes are in place to address user feedback and that the mechanism for assessing model use over time is functional and effectual.

Model Limitations and Uncertainty

All models, by definition, have limitations and create uncertainties in their use. The insurer should demonstrate that it understands the limitations and uncertainties of the SBA model

and its feeder models, including how these are accounted for. To the extent possible, the impact of such uncertainties should be quantified. The quantification should avoid spurious accuracy (e.g., using ranges instead of single-point estimates).

Where only a qualitative assessment is possible, insurers should have processes to deal with such, including considerations on whether this should be discussed with the Authority. This is an explicit assessment of the impact of model limitations and inaccuracies that is separate from the risk margin.

The quantitative and qualitative assessment results should be reported on as part of the model risk reporting and a determination should be made on whether adjustments to the BEL are required.

Pre-Model Adjustments, In-Model Adjustments and Post-Model Adjustments

Pre-model adjustments refer to cases where an insurer overrides a data input or assumption to a model. In-model adjustments refer to cases where an insurer overrides (e.g., through a cap or floor) a calculated value in a model. Post-model adjustments refer to cases where the insurer overrides a model's output by applying a model overlay. The insurer's model risk management policy and standards should detail the circumstances under which such adjustments may or may not be used, including outlining processes regarding review, approval, continued use, removal and back-testing of such adjustments.

Such adjustments and overlays should not be viewed as permanent solutions that dissuade the insurer from making necessary improvements to the model. Processes to monitor and analyse such adjustments and overlays should be in place to address underlying limitations and issues through data enhancements, model recalibration or redevelopment.

All model adjustments and overlays should be well-documented in line with the insurer's documentation standards and subject to a transparent process that links appropriate justification to specific model issues and limitations. As part of the process, model adjustments should be clearly outlined, and model results should be reported through the

insurer's internal governance processes with and without adjustments to enable decision-makers to understand the extent and impact of such adjustments.

Model Validation

Model validation is the set of processes and activities intended to verify that models perform as expected, in line with their design objectives, regulation and business uses. Effective model validation helps reduce model risk by identifying and assessing the impact of model limitations and errors, corrective actions and appropriate use. It also assesses the reliability of a given model based on its underlying assumptions, theory and methods. This way, model validation provides information about the source and extent of model risk. Validation can also reveal deterioration in model performance over time and set thresholds for acceptable levels of error through analysis of the distribution of outcomes around expected or predicted values. Effective validation helps ensure that models are sound.

Model validation shall be performed by staff with appropriate incentives, competence, influence and authority so that there is an effective challenge mechanism. Insurers shall demonstrate that the model has been validated independently (externally or internally) by those who develop, change, update, run and use the model. Independence shall be demonstrated not just by the separation of lines but also by process, actions and outcomes. Overall, the quality of the validation process shall be judged by the degree and way in which models are subject to critical examination.

All SBA models shall be validated before use and at fixed intervals of at least three years thereafter or such other higher frequency considered appropriate by the insurer in line with its model risk management policy requirements. The range and rigour of validation activities conducted before the first use of a model should be in line with the potential risk presented by the use of the model.

The model validation process shall, at a minimum, specify the following:

1. Scope of validation:
 - a. Data and other input:

- b. Assumptions;
 - c. Processing;
 - d. Methodologies;
 - e. Controls and governance;
 - f. Model review process;
 - g. Output and use; and
 - h. Documentation.
2. Processes, methods and tools to be used;
 3. Frequency of validation;
 4. Model changes;
 5. Persons involved, roles, reporting lines and escalation paths; and
 6. Output and reporting.

The model validation process shall apply to all SBA model components and cover all requirements. It shall also equally apply to models developed in-house and those purchased from or developed by vendors or consultants. Material model changes, for example—in terms of scope, structure, methodologies, assumptions and governance, and all model redevelopment—should be subject to validation activities of appropriate range and rigour before implementation.

It is important to ensure that upstream and downstream models are also taken into consideration as part of the model validation processes. If a model is used as a feeder model (a model which produces outputs that are used as inputs for another model(s)) in the SBA model that is undergoing validation, an effective validation programme ensures that those models are also evaluated for soundness and acceptable performance. The same applies to downstream models where the SBA model undergoing validation is used within other existing models. Validators should consider the extent to which downstream models should be included. Where there is limited access to such models (e.g., code, formulas), the requirements specified under ‘Use of and Reliance on Third Party Models’ shall apply.

Model validation should go beyond reviewing or replicating model developers' work/code. As part of the validation process, insurers could consider a number of items, including but not limited to the following:

1. Review of conceptual soundness elements, including developmental evidence;
2. Sensitivity, stress and scenario testing;
3. Dynamic and static validation;
4. Roll-forward analysis;
5. Unit/cell testing;
6. Reconciliation against the input source or ledger;
7. Outcome analysis including back-testing;
8. Trend analysis and stability testing;
9. Profit and loss attribution;
10. Independent full model replications, sample recalculations and formula inspection, as appropriate;
11. Process and controls verification;
12. Benchmarking or alternative design methods/models; and
13. Other validation tools as determined to relevant and appropriate.

The above items are not expected to be limited to independent validation work. Many of them could be considered part of the first-line actuarial activities such as a model review.

The SBA model validation shall require insurers to produce detailed model validation reports. The reports should document the validation process and conclude on the adequacy of the model component or model being validated and the appropriateness of the resulting technical provisions for regulatory reporting purposes.

There shall be a clearly defined reporting structure to senior management and the board, remediation and follow-up process for model validation findings, an action plan and implementation monitoring.

If significant deficiencies are noted as an outcome of the validation process, the model's use shall not be allowed or shall only be permitted under very tight constraints, including

escalation to, and approval by, the Authority. The reference to ‘significant’, in this case, does not refer to every material finding. The Authority notes that it may be challenging to define what significant means in this context and shall allow insurers to determine this internally in consultation with the model validators and the internal control functions.

Validation activities should continue on an ongoing basis after a model goes into use to track known model limitations and identify any new ones.

Model Review, Ongoing Development and Monitoring

Insurers shall establish a requirement for periodic review of the SBA models as part of the model risk management programme. A model review does not need to be done by an independent party. It may be done by model developers, implementers or users. The purpose of a model review shall be to highlight potential changes since the last validation or reporting cycle, determine the sufficiency of the latest validation activities, highlight areas needing a deeper dive, model performance monitoring and reverify the technical aspects of the model. A model review shall be carried out regularly but no less frequently than annually. The insurer should consider whether feeder models, such as asset and liability models, should be considered in the model review process and what reliance is placed on work already done on those models. The model review shall not be as detailed as model validation, but the level and scope of review should be assessed to be proportionate and fit for purpose in line with the model tier, frequency of review and depth of the most recent review.

The model’s performance shall be regularly monitored, and key metrics observed and reported. As part of the monitoring process, an assessment should be carried out to determine if the model’s performance in production is in line with model development and testing stage expectations/results. Insights could be gathered by applying key controls, such as the BEL and/or spread movement analysis, where the current-period BEL and/or spread is reconciled with that from the prior period.

The work carried out by first-line actuarial teams as part of ongoing reporting (e.g., regular model and control updates as part of quarterly or half-yearly reporting) does qualify as a model review to the extent that such work also covers a proportionate review of the technical aspects of the model, including model performance. To avoid doubt, the Authority does not expect insurers to set up a separate model review team but would expect a model review to be embedded in the work by first-line actuarial teams. A log should be kept listing all model and control updates and changes. Updates considered material should be subject to testing, and the testing results also captured in the log. The decision and rationale to include or exclude feeder models from the model review process should also be logged. Material changes and the decision to include or exclude feeder models shall also be subject to the challenge of an appropriate management committee. Testing is not required for changes considered immaterial. Nevertheless, the insurer should have mechanisms to monitor the aggregate impact of a combination of such changes to the extent they become material. No further documentation of the model review process is expected besides maintaining the model review log. The model review log shall be subject to annual review by the approved actuary.

Model Risk Reporting and Deliberation

Insurers should ensure model risk is captured promptly and reported to a management committee regularly. This could take the form of standalone model risk management reports or dedicated sections within the existing wider risk and actuarial functions reporting. An insurer's risk, investment and actuarial functions should collaborate and ensure there is clarity within the firm on ownership for model risk reporting for both the SBA and its feeder models to avoid leakages in reporting. Management should be able to demonstrate (e.g., through management committee minutes, report improvements and ultimate decisions taken) that the level of deliberation on model risk reports offers appropriate challenge and is adequate. While no explicit deliberation by the board on model risk reports is mandated, it is important that the board recognises it is the ultimate owner of the use of the SBA model and is, therefore, expected to have, and be able to demonstrate, an overall understanding of the application of the SBA and its importance for the insurer's business.

Model risk management reports should be of the appropriate detail, covering all relevant key information proportionately. Information submitted to management committees on the use and application of the SBA shall include at least a reasoned analysis of the reliability and adequacy of the calculation and the sources and degree of uncertainty of the output. The reasoned analysis should be supported by a sensitivity analysis that includes an investigation of the sensitivity of the output to each of the major risks underlying the obligations covered in the technical provisions, including an assessment of the impact of identified limitations. The risk and/or actuarial function should clearly state and explain any concerns they may have regarding the adequacy of the BEL and technical provisions.

Tolerance levels should be in place and reviewed periodically to ensure they are not set too low or too high in line with the insurer's definition of materiality. Other items to be considered for reporting including how they measure against tolerances may include but shall not be limited to:

1. The volume of models considered high-risk;
2. Models with temporary exemptions or provisional approvals;
3. Status of model issues (e.g., past due, work in progress, partially completed);
4. Summary of model performance metrics, including a list of underperforming models and actions being taken;
5. Lists and trends by the tier of the number of models:
 - a. With past-due validations;
 - b. In use without validation;
 - c. Used outside of approved purpose; and
 - d. Used despite rejection outcome from review/validation.
6. Model risk events/incidents reported for the period;
7. Quantification and treatment of material and/or aggregate model uncertainties;
8. Model development and enhancement efforts in progress and allocated resources;
9. Resource-related indicators (e.g., budget, people, infrastructure) and an assessment of the impact on other areas (e.g., impact on model testing, documentation, ongoing monitoring); and

10. Summary of key model outputs plus the outputs of key model risk management activities for the period under review.

Use of and Reliance on Third-Party Models and Outside Experts

Vendor models should be included in the insurer's broader model risk management framework following the same principles as applied to in-house models with any modifications appropriately justified and documented. Insurers should, for both SBA and SBA feeder models, obtain the following:

1. Developmental evidence explaining the model's components, design and intended use to determine whether the model is appropriate for the insurer's products and risk exposures;
2. Information regarding the data used to develop the model, including the use and effect of alternative data;
3. Sufficiently detailed testing results that show the third party's model works as expected;
4. Documentation of the model's limitations and assumptions about when the model's use may be unsuitable or problematic;
5. Clear instructions for model implementation, including any decisions that should be made regarding parameters or thresholds;
6. Insurers should require vendors to conduct ongoing performance monitoring and outcomes analysis, with disclosure to their clients, and to make appropriate modifications and updates over time;
7. Insurers are expected to validate their use of vendor products;
8. Insurers should obtain information regarding the data used to develop the model and assess the extent to which that data is representative of their circumstances;
9. The insurer should conduct ongoing monitoring and an outcomes analysis of vendor model performance using the insurer's outcomes;
10. Additionally, where third-party/vendor models do not provide complete access to development codes, the insurer should be able to demonstrate how they obtain confidence from using third-party models (e.g., through using in-house models for benchmarking and or building challenger models); and

11. Insurers should have contingency plans for instances when the vendor model is no longer available or cannot be supported by the vendor.

Where reliance was placed on outside experts and third-party models (e.g., on asset assumptions) in developing the SBA models, systems and processes should be in place to determine the appropriate level of reliance. The following should be considered at a minimum:

1. Whether the individual or individuals upon whom reliance has been placed are experts in the applicable field;
2. The extent to which the model has been reviewed or validated by experts in the applicable field, including known material differences of opinion among experts concerning aspects of the model that could be material to the actuary's use of the model;
3. Whether there are industry or regulatory standards that apply to the model or the testing or validation of the model, and whether the model has been certified as having met such standards; and
4. Whether the science underlying the expertise is likely to produce useful models for the intended purpose.

Model Risk Management Audit

Internal audit shall review model risk management to ensure there is an effective challenge provided by second-line and model validators to the model owner, developers, users and implementers and that the model risk management policy and procedures are kept current, in keeping with regulatory requirements and best practices. Internal audit should provide assurance on the level of critical review and challenge provided by the validation and model review activities, adequacy and frequency of model risk reporting and the manner of challenge (and decisions thereof) by management and board to such reporting. Overall, internal audit should form its own independent opinion and provide assurance or otherwise on the adequacy of the model risk management activities performed by both the first-line and second-line functions given these proposed changes to the Guidance Note.

2.16. Enhanced Reporting

The Authority proposes to enhance the data and information provided as part of the memorandum of supplementary actuarial information as required under paragraph 261 of the Guidance Note. The enhancements shall cover a broad range of areas, including but not limited to:

1. Asset and liability selection;
2. Asset assumptions;
3. Liability assumptions;
4. Cashflow analysis and matching;
5. Analysis of change;
6. Liquidity risk analysis;
7. Modelling;
8. Sensitivity analysis of asset and liability assumptions;
9. Stress testing;
10. Governance; and
11. Model risk management.

A detailed reporting template will be shared for field testing and shall consider the need to avoid duplication with Group Solvency Self-Assessment or Commercial Insurers Solvency Self-Assessment reporting.

2.17. Accountability

While the approved actuary is responsible for providing independent assurance to the Authority that the technical provisions have been assessed to be reasonable, it should be noted that this does not take away responsibility from both the insurer's management and board. Accountability cannot be outsourced and officers, including but not limited to the chief executive officer, chief investment officer, chief finance officer, chief actuary and other appropriate members of senior management, shall be accountable for the accuracy of the BEL. The BMA shall obtain attestations from:

1. The chief risk officer, regarding the adequacy and independence of their challenge and oversight on how the insurer applies the SBA

2. The chief internal auditor, confirming that the activities by both the first-line and second-line functions provide adequate assurance that the principles and requirements of the Guidance Note regarding the application of the SBA are fully met

The insurer's officers have a fiduciary duty to ensure the BEL and technical provisions are calculated responsibly and transparently, enhancing the protection of policyholder interests. The Authority shall, at any time, require the approved actuary and officers of the company to evidence their satisfactory fulfilment of this fiduciary duty.

2.18. Clarifications

The Authority has identified a need to clarify its position on the areas of the SBA's application discussed below. These are not changes to the regulatory regime, and as such, no grandfathering or transition will be applied. Insurers that may have used any of the practices below should notify the Authority and stop forthwith.

1. Repositioning is not allowed in the SBA. Paragraph 256 a. of the Guidance Note states "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." The Authority's expectations regarding repositioning are stated in section 2.10 above;
2. Fungibility of asset cashflows between blocks of business is not allowed in the SBA except to the extent that it is practical and allowed by the relevant law. Even where this can be demonstrated to be the case, it should be documented, tested, taken through the appropriate governance challenge and limited to the legal-entity level. No fungibility can be assumed to occur between legal entities in an insurance group;
3. Borrowing of any form to meet cashflow shortfall is not allowed in the SBA;
4. Using leverage to enhance investment returns is not allowed in the SBA. Insurers should reach out to the Authority if they need further clarity;
5. Implementation of the SBA methodology shall be in line with the Guidance Note. This requires explicitly projecting all asset and liability cash flows at a very granular level for the base scenario and under each of the eight scenarios. Methodology approximations are not allowed;

6. No credit for active portfolio management is allowed (e.g., in terms of assumed yield pickup);
7. Active trading (frequent purchases/sales of assets) within the SBA is not allowed. Reinvestment in the SBA is intended to cover reinvesting proceeds from asset maturities and any positive net cash flows for the period. Similarly, disinvestment is intended to cover the selling of assets to settle any negative net cash flows at the given time step, not to transition from one asset class to another for purposes other than maintaining the existing asset allocation;
8. The Authority recognises that derivatives can serve as an important risk management tool if used appropriately within a mature and robust governance and risk management framework. However, use of derivatives in the SBA is allowed for hedging purposes only upon approval by the Authority. In making its determination, the Authority will review several factors including but not limited to the insurer's hedging strategy, governance, risk management, stress testing, associated costs and risks and demonstrations on how these are reflected in the mechanics of the SBA calculation. Derivatives that are an inherent part of product design as is the case with fixed index annuities, do not need an explicit approval from the Authority. However, the same considerations noted above would apply and will be subject to review as part of the SBA model approval and the subsequent supervisory processes; and
9. Realistic transaction costs should be reflected in projected sales or purchases of assets.

3. STANDARD APPROACH

The Authority has been considering adjusting the Euro-denominated (EUR) discount curves for the Standard Approach. The change would eliminate differences between EUR rate curves provided by EIOPA and those provided by the BMA. The Authority has however noted that Bermuda insurers with EUR-denominated liabilities often carry out internal calculations using the EIOPA EUR-curve. Having observed that the two curves produce results that are not materially different, the Authority proposes to allow insurers to use the EIOPA EUR curve for EUR liabilities by default without seeking separate approval from the BMA. Depending on the feedback to this consultation paper, the

Authority will as part of the subsequent consultation paper, consider whether it should continue publishing a separate EUR-curve.

Consultation Questions – Technical Provisions:

Q.1 Do you see any practical issues that the proposals on the technical provisions may introduce?

Q.2 Do you have proposals on the definition to be adopted for HQLA and the haircuts that should be applied under stress?

Q.3 On default and downgrade costs:

- a. Do you have any proposals on the treatment of assets where no public data is available?
- b. Do you have any different proposals for treating unrated assets where public default loss data is available?
- c. Do you have any proposals on additional principles to consider when looking at rated and unrated assets where public default loss data is not available or available but too limited to be credible?

Q.4 Are there other areas in the Guidance Note covering the use of the SBA that, in your view, the Authority should further clarify?

B. BSCR COMPUTATION

4. LONG-TERM LAPSE AND EXPENSE RISK

4.1. Separate Identification of Lapse and Expense Risks

Currently, lapse and expense risks are covered by the long-term ‘other insurance risk’ charge, with no explicit identification of the risk components. To better reflect these risks and enhance the BSCR standard formula’s transparency, and to aid the Authority in its supervision, it is proposed that the other insurance risk charge be broken down into separate lapse and expense risk components, with explicit diversification incorporated. This change will be done in the context of changing the risk charge itself, as described in the following subsections.

In terms of the concrete BSCR standard formula structure, the proposal is to replace the current long-term ‘other insurance risk’ charge with new lapse and expense risk submodules. The correlation matrix for aggregating the long-term insurance risk components into the overall long-term ‘insurance risk’ charge would be modified (expanded) accordingly.

The proposed correlations would be as follows:

	Mortality	Stop loss	Riders	Morbidity and disability	Long	VA Guarantee	Lapse	Expense
Mortality	1							
Stop loss	0.75	1						
Riders	0.75	0.75	1					
Morbidity and disability	0.25	0	0	1				
Longevity	-0.5	-0.5	-0.5	0	1			
Variable annuity guarantee	0	0	0	0	0	1		
Lapse	0	0	0	0	0.25	0	1	
Expense	0.25	0.5	0.5	0.5	0.25	0.5	0.5	1

4.2. Lapse Risk

The current long-term ‘other insurance risk’ charges, meant to capture lapse and expense risks, are simple in nature, as they are factors applied to the regulatory reserves (i.e., BEL). There are a number of issues identified with the charges that require addressing. The current charges have the potential to result in capital held that is too low for certain types of liabilities and too high for some others. They also could lead to the same charge for any two policies/products with the same reserve amount, regardless of the characteristics of the products/policies, and are not readily applicable to products with negative reserves. The BEL is also generally not the most appropriate risk driver, as the extent of lapse risk on the

Economic Balance Sheet (EBS) valuation basis is closely tied to the difference between the EBS BEL and the surrender value of a policy rather than to the BEL alone.

The changes aim to make the capital requirements more risk-sensitive within the constraints of the BSCR standard formula framework. The Authority proposes to achieve this by introducing lapse (and expense) shocks to replace the factor-based calculation. Applying principles-based shocks from first principles will ‘automatically’ enable capturing all policy/product features and characteristics in a granular and realistic manner. The determination of the charges will follow the same conceptual and general principles as all the other existing shock-based calculations in the BSCR.

The Authority expects insurers to quantify and manage lapse risk appropriately within their portfolios and, as part of that, to be able to run lapse shocks. It is also noted that Schedule V(e) of the BSCR already requests relevant underwriting shocks; for any liabilities with material lapse risk, this would have included lapse shocks. Given the above, no extraordinary operational or infrastructure challenges would be expected to arise from the changes. Nevertheless, the introduction of certain simplifications or approximations could be considered for products with no material lapse risk, where appropriate.

Details of the proposal are as follows:

BSCR – Lapse Risk Capital Requirement

1. Determined by applying specified shocks, and (re)calculating the net asset value (capital and surplus) under the shocks:
 - a. Capital requirement will be equal to the change in the net asset value (assets – liabilities) resulting from the shocks; and
 - b. In practice, it involves calculating the post-shock BEL (by re-projecting liability cash flows) and comparing it to the before-shock BEL to determine the change resulting from the shock. Further implementation details will be confirmed.
2. Three shocks would be applied, with the most adverse determining the capital requirement:

- a. Lapse-up - Relative change to base lapse rates (i.e., option take-up rates); permanent (i.e., applied in all future years);⁴
 - b. Lapse-down - Relative change to base lapse rates (i.e., option take-up rates); permanent (i.e., applied in all future years); and
 - c. Mass-lapse - Instantaneous discontinuance of a large number of policies.
3. Additional details on the approach:
- a. Each of the shocks would be applied only to those policies, or homogeneous groups of policies, for which the shock results in an adverse outcome (i.e., to an increase in liabilities);⁵
 - b. No offset between (homogeneous groups of) policies or products would be assumed within the lapse-up and lapse-down scenarios (e.g., while policyholders are not completely rational, it is in general not appropriate to assume material increases /decreases in lapses where lapsing/not lapsing is disadvantageous for the policyholder);
 - c. For the mass-lapse shock, two options will be field-tested: 1) no offset (as per the above bullet); 2) full offset; and
 - d. Certain diversification would, however, be included in the construction. Taking the maximum of the three shocks means that some liabilities may not attract a charge under the capital calculation (e.g., if lapse-up is the biting scenario, then policies exposed to lapse-down would effectively not get charged). This contrasts with the current charges, where all policies get a charge.

The lapse shocks must align with international best practices and be adequate, considering the one-year 99% Tail Value at Risk (TVaR) calibration target. The Authority is considering regulatory benchmarks in relevant jurisdictions and regimes, particularly Solvency II and the Insurance Capital Standard (ICS). Nevertheless, at the same time, the Authority recognises the judgmental component inherent in the mass-lapse calibrations due to the nature of the risk. The Authority also notes the wide variety and complexity of

⁴ All options that can affect the amount of insurance coverage, including options that allow for partial or full termination or increase in the insurance cover, are affected by the lapse shocks.

⁵ ‘Homogenous groups’ are defined in the Guidance Notes.

products within the Bermuda market and acknowledges that there are important differences between product types (e.g., protection versus annuity), geographical differences in product features (e.g., surrender charges, market value adjustments), and legal and fiscal rules (e.g., tax (dis)incentives), which are likely to necessitate differentiated mass-lapse shock calibrations. For example, there is evidence of higher persistency and lower volatility for protection-type products, for which the (in)ability to obtain new coverage (or the same amount of coverage under similar economic terms) is a further important consideration influencing policyholder behaviour. There is also less incentive to surrender the policy (even in the conditions of a mass-lapse scenario) where there is no savings component, or the cash surrender value payable is of small importance relative to the protection provided.

A differentiated calibration will need to be based on credible evidence (both quantitative data and qualitative information), which the Authority seeks to collect further and enhance through the consultation process. As such, the mass-lapse shocks at this point are tentative and will continue to be refined. For the field testing, the shocks are as follows:

1. Lapse-up - A 40% permanent increase in lapse rates (option take-up rates);
2. Lapse-down - A 40% permanent decrease in lapse rates (option take-up rates); and
3. Mass-lapse - An immediate mass surrender of policies, where the mass-lapse shock magnitude is equal to three times (3x) the base lapse rates, subject to the absolute floors shown in the table below.⁶
 - a. The base lapse rates used for the purposes of deriving the mass-lapse shock magnitudes refer to the lapse assumptions used to determine the BEL;
 - b. Both options 1 and 2 should be tested and reported as part of the field testing. Given the judgmental component involved in the tentative calibrations, the options are intended to assess the impact of different floor levels; and
 - c. For field testing purposes, ‘protection products’ are defined as protection-type products with either no savings component or a cash surrender value that is of small importance relative to the protection provided. The protection element should be

⁶ For example, if the annual base lapse rate was 15%, then the instantaneous mass lapse shock to be applied would involve an immediate surrender of $3 \times 15\% = 45\%$ of the policies. If the base lapse rate was 10%, the instantaneous mass lapse shock would be 30% (before the application of the floors, where applicable).

the key factor to the policyholder’s decision to take out and continue maintaining the policy. ‘Other protection-type products’ mean products that provide both a protection element and a savings component, and each components is material to the product. The protection element should be a material factor in the policyholder’s decision to take out and maintain the policy. For the avoidance of doubt, policies typically taken predominantly for savings/investment purposes should not be classified in the ‘other protection-type products’ category only because they may include a death benefit or other risk covers/riders (i.e., materiality still needs to be considered). Products not fitting into the ‘protection products’ or the ‘other protection-type products’ categories should be classified into the investment category by default. The Authority expects that these definitions will continue to be refined for the second version of the consultation paper.

Absolute floors for mass lapse	Option 1		Option 2	
Product category	Retail	Non-retail	Retail	Non-retail
Financial/investment products	[20.0%]	[30.0%]	[40.0%]	[60.0%]
Protection products	[10.0%]	[15.0%]	[20.0%]	[25.0%]
Other protection-type products	[15.0%]	[20.0%]	[25.0%]	[30.0%]

The lapse risk charge is part of the BSCR standard formula; therefore, the calibration is not company-specific; this is no different from any of the other BSCR charges. To remove all doubt, no Section 6D adjustments will be available on lapse risks. Nonetheless, the partial internal model route always remains open. The Authority would expect increased interest in partial internal models because of the changes, particularly where there may be specificities not captured by the standard shocks. The Authority would consider requests for partial internal models for lapse risk where appropriate, subject to internal model approval requirements, including justification of the scope and ‘no cherry-picking’.

The Authority recognises that, for insurers using the SBA, the interaction between the lapse risk stresses and SBA may create some special considerations regarding asset-side impacts. While it is not the Authority’s intent to incorporate additional market risk within the BSCR

lapse-risk charges, the application of the stresses should reflect the actual impact of lapse stresses on the EBS BEL if such stresses were to materialise. The Authority expects to issue further guidance on the implementation details for SBA users. The Authority also notes that the risk margin is not intended to capture market risk, and an adjustment for SBA users to carve out potential market risk-related elements from the lapse risk component of the risk margin may be warranted.⁷

The Authority proposes to apply a ten-year transitional period to the new lapse risk charges.

4.3. Expense Risk

Breaking down and replacing the long-term other insurance risk charge necessitates a new, dedicated charge for expense risk. Like lapse risk, the aim is to increase risk sensitivity and transparency of the charges. This would be done by applying specific expense shocks.

Details of the proposal are as follows:

BSCR – Expense Risk Capital Requirement

1. The capital requirement will be determined by applying specified shocks, and (re)calculating the net asset value (capital and surplus) under the shocks. In particular, this involves recalculating the BEL under the shocks. The difference between pre-shock and post-shock values will be the capital requirement.
2. A combination of the following two shocks will be used:
 - a. A relative increase in all (unit) expense assumptions; and
 - b. An absolute (basis points (bps)) increase in expense inflation rates per annum.
3. Additional details on the approach:
 - a. The shocks are to be applied simultaneously; and

⁷ A potential approach could be to determine the capital component as the difference in the expected present values of 'base case' and stressed liability cash flows, while keeping the discount rates unchanged between the base and the stress.

- b. The application will be principles-based. For example, contractually fixed expenses would not be affected by the shock (i.e., would not change as a result of the shock).

The Authority proposes to take the ICS expense shocks as a starting point. The following shocks are considered:

1. x% increase in all unit expenses; *plus*
2. y bps increase in expense inflation rate per annum;

where the parameters depend on the region as follows:

Region	x% (unit expense)	y (expense inflation), bps
United States (US), Canada, European Economic Area, Switzerland, Japan	6%	100 bps
Other developed markets	8%	Year one – ten: 200 bps Year 11 onwards: 100 bps
China, other emerging markets	8%	Year one – ten: 300 bps Year 11 – 20: 200 bps Year 21 onwards: 100 bps

To avoid doubt, no Section 6D adjustments will apply to expense risks. Nevertheless, for this specific risk, the Authority does not expect that there would be any need for adjustments due to the general nature of the expense shocks and the fact that the shock-based approach should already adequately reflect the nature of different parts of expenses (e.g., the degree to which they are or are not contractually fixed).

The Authority proposes to apply a ten-year transitional period to the new expense risk charges.

5. PROPERTY & CASUALTY CATASTROPHE RISK

Currently, the insurers' catastrophe risk requirement allows for natural catastrophe perils and terrorism catastrophe risk on an ad hoc basis when deemed material. It is proposed that

the BSCR Catastrophe Risk module be enhanced to include a dedicated man-made catastrophe risk submodule. This offers several benefits, such as:

1. The BSCR adopts the trend followed by other internationally recognised insurance capital models by explicitly modelling man-made catastrophe risk perils;
2. A dedicated man-made catastrophe module offers the industry certainty as it reduces the need for ad hoc capital adjustments for non-modelled catastrophe perils; and
3. It promotes good risk management as the scenarios are risk-sensitive.

The dedicated man-made catastrophe risk submodule will be comprised of catastrophe scenarios for the following perils:

1. Terrorism
2. Credit and Surety
3. Marine
4. Aviation

The man-made catastrophe risk submodule must be in line with international best practices, credible, and adequate considering the one-year 99% TVaR calibration target. The Authority is considering regulatory benchmarks in relevant jurisdictions and regimes, particularly Solvency II and ICS. The specification of each scenario is as follows:

5.1. Terrorism Catastrophe Scenario

The risk charge is calculated as the sum of the losses from the following two components:

1. Total loss of property (including building, content and motor vehicles) from insurance contracts and the impact on other insurance contracts resulting directly from the loss of property; and
2. The losses from health coverage and workers' compensation.

The scenario is a five-tonne bomb blast for the largest geographical risk concentration partly or fully located within a radius of 500 metres. To determine this concentration, all buildings (including properties for the insurers use) are considered.

For property damage, including insured properties and related covers, the following assumptions are made:

1. 100% damage ratio within a circular zone of a 200-metre radius;
2. 25% damage ratio for the next circular zone up to a 400-metre radius; and
3. 10% damage ratio between 400 and 500 metres.

For fatalities, the following assumptions are made:

1. 15% fatality rate within a circular zone of a 200-metre radius; and
2. 1.5% fatality rate between 200 and 500 metres.

For disabilities, the following assumptions are made:

1. 20% disability rate within a circular zone of a 200-metre radius; and
2. 10% disability rate between 200 and 500 metres.

Fatalities and disabilities should only consider liabilities from insurance contracts (e.g., health insurance policies). In particular, liabilities to the insurer's own staff that do not originate from insurance contracts (e.g., through benefits or other forms of exposure) should not be included.

5.2. Credit and Surety Catastrophe Scenario

The risk charge is calculated as the aggregation of the losses from the following three components:

1. Mortgage insurance;
2. Trade credit; and
3. Surety.

A 75% correlation factor is assumed between the three components.

Mortgage insurance

The scenario is calculated as an aggregate loss amount resulting from an increase in the frequency and severity due to the specified decline in home prices. A 25% decline in home prices is assumed to persist for the entire one-year time period. The total loss amount

includes the impact of both an increase in the frequency of delinquency and defaults and an increased loss severity that results from the decline in home prices; and

In implementing the stress scenario and to account for differences in risk profiles across various exposures and activities, portfolios and business activities are segmented into categories based on common or related risk characteristics. Appropriate models should be used to translate the relevant risk factor (home price decline) into the financial impact (increased losses). Where applicable, those models that the (re)insurer already uses to calculate stress losses, premium deficiency reserves or other loss measures should be used.

Trade Credit

The credit stress scenario for trade credit is defined as the total loss amount due to the inability of the policyholder’s customers to pay for goods delivered and/or services provided. The trade credit coverage indemnifies the policyholder for bad debt losses incurred due to a customer’s inability to pay. A policyholder’s customer’s inability to pay is indicated by an increase in the probability of default and the loss given default of that customer. The total loss amount is adjusted for any existing loss mitigation, including reimbursements from the policyholder, retention etc.; and

To help approximate these total loss amounts, (re)insurers should first calculate their aggregate net earned premium for trade credit by an external credit rating category: investment grade versus non-investment grade. Then the following factors are applied to net premiums earned over the next 12 months’ rating category. Considering that the scenario does not require the identification of specific defaulting customers, the factors should be applied to the net premium earned to reflect the impact of reinsurance. No further adjustment for reinsurance protection (e.g., non-proportional reinsurance) is required to calculate the loss amount.

Credit stress factors for trade credit	
Rating category	Factor
Investment grade	80%

Non-investment grade	200%
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Surety

The credit stress scenario for surety is defined as the total net potential loss amount based on the penal sum of the surety bond. A surety bond indemnifies the policyholder from the principal’s inability to perform its contractual obligation. The penal sum represents the maximum amount that the (re)insurer must pay to the beneficiary. The re(insurer) calculates the largest net potential losses for its ten largest exposures to surety counterparties (principals) using the methodology described below. The total net potential loss amount assumes that the two largest net losses have occurred and is, therefore, equal to the sum of the two largest net losses;

The net potential loss amount for a principal is calculated using the gross exposure of the principal (after any contractual amortisation that has occurred). The loss severity model 95% Probable Maximum Loss (PML) factor is applied to the gross exposure. For US exposures, the loss severity model 90% PML for each principal can be calculated using the most current construction loss severity model developed by the Surety & Fidelity Association of America. For non-US exposures, a loss severity model 95% PML worst-gross-loss-to-exposure ratio for the past ten years in that country or for that exposure type is used, whichever is the most granular. The loss amount is then adjusted for any co-surety arrangements, acceptable cash collateral (currently in the (re)insurer’s custody) and reinsurance arrangements;

The co-surety amount and the adjustment for reinsurance are calculated using existing terms of the surety exposure. Adjustments can only be made for cash collateral already in custody with the (re)insurer or in a trust for which the (re)insurer is a beneficiary; and

Example of credit stress for surety:

	Loss calculation	Surety exposure (US\$)
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1	Gross exposure for principal	\$10,000,000
2	Loss severity model 95% PML factor	0.4
3	Loss severity model 95% PML amount = (1) * (2)	\$4,000,000
4	Adjustment for co-surety (co-surety % * (3))	\$400,000
5	Net PML amount after co-surety = (3) - (4)	\$3,600,000
6	Acceptable cash collateral	\$100,000
7	Net PML amount = (5) - (6)	\$3,500,000
8	Adjustment for reinsurance	\$50,000
9	Net potential loss amount	\$3,450,000

5.3. Marine Catastrophe Scenario

The scenario for marine risk combines the results from a vessel collision and a platform explosion where the two events are assumed to be independent;

The capital requirement for the vessel collision is based on the maximum sum insured for a single vessel across the hull, liability and pollution exposures; and

The capital requirement for the platform explosion is the maximum sum insured for a single (oil or gas) platform. This should cover the sum insured for compensation for property damage, wreckage removal, loss of production, capping/securing the well and liability losses arising from the explosion.

5.4. Aviation Catastrophe Scenario

The aviation scenario requires the single largest aircraft sum insured across the hull and liability perils.

5.5. Other Considerations

Aggregation Assumptions

Independence is assumed between:

1. The man-made catastrophe risk scenarios; and

2. The (existing) natural catastrophe submodule and the (new) man-made catastrophe submodule.

Risk-Mitigating Effect of Inwards Reinsurance

Allowance for the risk-mitigating effect of inwards reinsurance should be made where applicable. This should consider all contractual cashflows, both inflows (e.g., recoverables) and outflows (e.g., reinstatement premiums); and

When insurers allow for any reinsurance credit, they should ensure that there is no double counting (e.g., the total recoveries credited from a reinsurance contract across all the BSCR catastrophe scenarios should not exceed the total available protection from that contract).

Transitional Arrangements

The charges for the new catastrophe scenarios will be phased in over a period of three years.

Consultation Questions – BSCR Computation:

Q.1 Do you see any practical issues that the proposals on the BSCR computation may introduce?

C. SECTION 6D

6. SECTION 6D ENHANCEMENTS

The section 6D framework, in its current format, could benefit from more clarity on the types of adjustments that are allowable or the standards an application is expected to meet. The BMA aims to revise its section 6D framework to be more defined, standardised and transparent in terms of the scope and requirements. Among other things, it will help insurers understand the areas where and circumstances under which they may elect to apply for an adjustment to the standard BSCR framework. The BMA aims for the revised section 6D regime to allow for a certain pre-defined set of adjustments that fall under one of three different routes:

6.1. Route 1 – Simple Adjustments

Scope – Simplest adjustments, namely:

1. Treatment of material (re)insurance limits/risk mitigation techniques (e.g., consideration of material adverse development covers, stop loss, long-term excess of loss insurance or simple longevity swaps bought for protection);
2. Removal of Loss Portfolio Transfer (LTP) premiums to avoid double-charging LTP transactions;
3. Early adoption of the new BSCR rules (in their totality only);
4. Application to use issuer external rating from an approved credit rating agency:
 - a. When no directly applicable (issue-level) credit rating exists; and
 - b. If the exposure in question ranks equally or senior to (other) senior unsecured exposures of that issuer.
5. Application to use ratings from a credit rating agency approved for regulatory capital purposes under other recognised regulatory regimes/jurisdictions (subject to limits on exposures/asset types/etc.)

Requirements

1. Support of application - Insurers should provide reasoning and supporting analysis as to why and how the arrangement results in the insurer's risk profile being materially different from the standard BSCR calculation;
2. BSCR consistency - The assumptions underlying the modified capital calculation should be consistent, or more prudent, than the assumptions underlying the BSCR calculation. Among other things, this would apply to the following aspects of the BSCR calculation: stress factors, correlation assumptions, statistical and methodological consistency and calibration; and
3. Data - The data used in the analysis should be demonstrated to be complete, accurate and appropriate.

6.2. Route 2 – Simple-Complex Adjustments

Scope – More complex than route 1, namely:

1. Modification of premium or reserve risk factors; and
2. Consideration of risk mitigation techniques not addressed under route 1 (typically relating to the use of derivatives used in non-shock-based approaches or more complex longevity swaps bought for protection).

Requirements

Route 1 requirements (as relevant) and additionally;

1. ECR ratio - The insurer operates at an ECR ratio of equal to or greater than 120%;
2. Support - Insurers should provide reasoning and supporting analysis as to why and how the proposed revision is a more accurate reflection of the insurer's risk profile than the BSCR;
3. BSCR consistency - The proposed adjustment should not produce material inconsistencies to the BSCR calculation;
4. Cherry picking – The applicant should confirm that there are no other areas of risk where, based on their internal view of risk and capital, the BSCR is considered to be materially understating the insurer's risk exposure;
5. Calibration – Applicants should use the 1-in-100 TVaR over a one-year view. An alternative metric may also be used if it can be demonstrated to be at least as prudent in determining the ECR;
6. Statistical test:
 - a. The methodologies used should be based on rigorous actuarial and statistical techniques;
 - b. The modelling techniques used should be appropriate to the nature, scale and complexity of the risks to which the insurer is exposed;
 - c. All material assumptions/expert judgement have been assessed for veracity and suitability;
 - d. The areas that rely on expert judgement are known, and sufficient challenges have been applied to these areas; and
 - e. The proposed capital modification should not introduce material statistical or methodological inconsistencies.

7. Validation - Key aspects of the exercise should undergo validation annually; and
8. Documentation - Documentation should be kept for the following:
 - a. Internal sign-off process for the proposed modification;
 - b. Governance of the data underlying the analysis;
 - c. Process of estimating the modification and its governance;
 - d. Material assumptions/expert judgement used and their governance; and
 - e. Validation results.

6.3. Route 3 – Complex Adjustments

Scope – Most complex cases, namely:

1. Use of internal credit ratings when ratings from BMA-approved institutions are not available; and
2. Applications not covered elsewhere in the section 6D framework, if:
 - a. Application is within the spirit of the framework; and
 - b. Insurer's adjusted BSCR (after allowing for the benefit of any adjustments from any of the three routes) is no less than 10% lower than the standard BSCR.

Requirements

Route 2 requirements and additionally:

1. Governance - A dedicated governance framework should be in place that ensures the ongoing appropriateness of the design and operations of the modelling that supports the capital modification and continues to reflect the insurer's risk profile appropriately. Among others, this would require the following:
 - a. A model change policy that distinguishes between minor and major changes;
 - b. Key stakeholders (risk management, users of modelling output, heads of affected business units, senior management) should understand the modelling, which is commensurate to their direct or indirect use;
 - c. Ensuring there are adequate, independent review procedures in place; and
 - d. Documentation of the modelling process (i.e., data, assumptions/expert judgement, parameterisation, modelling and output) and any changes to it.

2. Use test - The modelling underlying the capital modification should be used in the insurer's risk management system and decision-making processes;
3. Validation - The data, assumptions/expert judgement, parameterisation, modelling and output should undergo independent validation annually. Among others, this would require the following:
 - a. A validation policy; and
 - b. The monitoring of performance, review of the ongoing appropriateness of modelling specifications, and testing of results against experience.
4. Documentation - there should be documentation to provide a detailed description of the structure, design, theory, operational details, input assumptions, parameters, governance process and controls of the modelling underlying the capital modification.

The following additional requirements apply for the use of internal credit ratings:

1. Identification of risks - The internal credit assessment should consider all relevant factors and sources of risk—qualitative, quantitative, systemic, and idiosyncratic—which could influence the credit risk associated with the exposure being rated, including:
 - a. The financial position (including liquidity) and financial policies of the issuer;
 - b. the issuer's financial track record and trends in the issuer's financial performance;
 - c. the complexity of the issuer's business model;
 - d. the issuer's size, growth and the level of diversity in its activities;
 - e. the quality of the issuer's management;
 - f. competitive position of the issuer;
 - g. external market factors, including past and expected sector and industry dynamics and economic outlook;
 - h. impact of economic stresses;
 - i. terms and conditions of the instrument/loan agreement (including seniority, security and any covenants in place);
 - j. cash flow predictability;
 - k. any collateral and volatility of its value;
 - l. the impact on issuer's risk profile and financials of issuing the debt being rated;

- m. refinancing risk;
 - n. the issuer's ownership structure;
 - o. risks arising from third parties (e.g., sponsors, parties involved in the servicing and managing of the debt, if applicable);
 - p. legal, political and regulatory risks;
 - q. country risk; and
 - r. potential future and emerging risks (e.g., impact of climate risks).
2. Internal credit assessment methodology and criteria - The internal credit assessment methodology and criteria should:
- a. Set out the overall credit assessment philosophy and the ratings process;
 - b. Set out the scope of the types of exposures and entities that the methodology applies to;
 - c. Set out the scope of risks covered and define the credit and other relevant risks being measured;
 - d. Where an accepted credit rating agency has published a credit rating methodology for an asset class, consider at least the same range of risks, qualitative and quantitative factors and risk mitigating aspects (or justify differences in the scope);⁸
 - e. Consider the characteristics of comparable assets for which a credit assessment by an accepted credit rating agency is available;
 - f. Describe how different asset features, risks and other relevant factors are assessed;
 - g. Set out the key assumptions and judgements underlying the assessment, including the treatment of any assumed risk-mitigating actions that rely on the firm's own or outsourced processes involved in managing assets through their lifecycles;
 - h. Define whether the credit assessment is calibrated to a through-the-cycle or point-in-time view, and comment on the appropriateness;
 - i. Use both qualitative and quantitative factors;
 - j. Explain the limitations of the internal credit assessment (e.g., risks which are not covered), and when it would not be appropriate to allow for these limitations by overriding judgements.

⁸ 'Accepted' (credit) rating agency means external credit rating agencies accepted for BSCR purposes, as laid out in the instructions in force.

3. Internal credit assessment methodology and criteria – i.e., where the insurer has decided that its internal credit assessment methodology for a particular asset class should be based on an accepted rating agency’s published credit rating methodology applicable for that asset class, the insurer should apply that methodology in full in the manner applied by the rating agency.
4. Data and expert judgments:
 - a. Insurers should consider the availability, appropriateness and quality of the data over the credit cycle on which their internal risk assessments and calibrations are based;
 - b. Insurers should clearly document how any incomplete or missing data has been allowed for in the internal credit assessment;
 - c. Expert judgements made in the determination of the internal credit assessment and BSCR mapping should be transparent, justified and documented, and consideration should be given to the circumstances in which judgements on the rating would be considered false. The key judgements should be subject to an appropriate level of governance within the overall credit assessment process;
 - d. The history of judgements applied to deviate from the results of the internal credit rating methodology should be well documented, as should any other end-of-process overriding adjustments to the internal credit ratings themselves.
5. Expertise and potential conflicts of interest:
 - a. The credit rating methodology and criteria development and approval, credit assessment, and BSCR mapping should be performed by individuals with relevant asset-specific credit risk expertise and competency, who are independent and with minimal conflicts of interest. This applies to both internal resources internal and those potentially external to the insurer;
 - b. Insurers should demonstrate the independence of the internal credit assessment function and demonstrate that effective controls are in place to manage any potential conflicts of interest between different stakeholders involved in the overall management of the assets;
 - c. The internal credit assessment should be procedurally independent from the decision to underwrite;

- d. Individuals deciding or approving the internal ratings (e.g., voting members of the credit committee) should be without conflicts of interest and independent of both the investment decisions and management of the assets; and
 - e. The rating approval process should be organised and structured in a way that ensures independence of the decisions and does not cause incentives or put pressure on the individuals to decide in a certain way.
6. On-going review and assessment:
- a. Insurers should perform validation of the internal credit assessment methodology and criteria, including how it has identified and allowed for all relevant sources of credit risk (whether quantitatively or qualitatively);
 - b. Insurers should have a robust process for the ongoing review of the credit assessments, including demonstrating how the insurer has satisfied itself that the assessments will remain appropriate over the lifetime of the assets and operate robustly under a range of different market conditions and operating experiences;
 - c. The credit assessments should be reviewed and the assets re-rated at regular intervals, as well as in response to changes in relevant external market conditions or other factors that are expected to impact the rating; and
 - d. Insurers should ensure and monitor that the internal credit assessment criteria are applied consistently both within and across asset categories and over time.
7. Limits and restrictions:
- a. Where, for an internally rated asset, external ratings exist from any one or several accepted credit rating agencies, the final rating used for BSCR purposes is capped to be no higher than the lowest of such external ratings;
 - b. Internal credit ratings cannot be used for affiliated assets for Section 6D applications⁹, they may however be allowed with an approved internal model;
 - c. The amount of assets for which internal credit ratings can be used in the BSCR is subject to limits and will be no more than 20% of total investments; and
 - d. The Authority may, based on a holistic evaluation of all aspects of an insurer's internal credit assessment framework and process, as a condition for approval,

⁹ For the purposes of this section, 'affiliated assets' include (credit) exposures to affiliated entities and (otherwise unaffiliated) assets originated by affiliated entities.

require a downwards adjustment (notching down) on the insurer's internal credit ratings for BSCR purposes. The size of such adjustment will be determined on a case-by-case basis. The adjustment will be permanent, but its continued appropriateness may be reviewed periodically if circumstances warrant.

6.4. Other Considerations

Application Process for New Section 6D Adjustments

Insurers who wish to make adjustments under any of the section 6D routes should submit a formal application pack that, at a minimum, provides evidence that the requirements under the relevant route are met along with any additional material requested. Following its review, the BMA will reach out to communicate its conclusions. For more complex cases (typically under route 3), insurers are encouraged to contact the BMA for preliminary discussions.

Annual Review of Section 6D Adjustments

BMA approvals under section 6D will continue to be subject to annual regulatory review. Insurers would need to submit an application pack that demonstrates ongoing compliance with the standards set out under the respective route.

Transitional Arrangements

Transitional arrangements will be offered for any adjustments already granted but that fall outside the revised section 6D regime, so long as there are no material changes that affect the adjustment. The following transitionals will be used:

1. For insurers with liability duration of <5 years, a five-year transition will apply; and
2. For insurers with liability duration of ≥ 5 years, a transition period equal to their liability duration will apply but be subject to a cap of ten years.

Consultation Questions – Section 6D Enhancements:

Q.1 Do you see any practical issues that the proposals on 6D enhancements may introduce?

III. PROPOSED AMENDMENTS TO LONG-TERM ENTITY FEES

The life/long-term insurance sector in Bermuda has grown significantly over the last number of years, driven by new entrants in the market with diverse business models as well as an increase in the size and complexity of existing entities.

Maintaining high-quality and effective supervision by the BMA is an important foundation to ensure adequate policyholder protection and continued financial stability.

While highly effective supervision presents significant benefits, it also comes at a cost that must be borne by insurers. Given the increased volume and complexity of long-term insurers in the jurisdiction, the Authority needs to revamp its fees to meet the cost of supervision that would enable it to have the appropriate level of resources, tools and processes to effectively supervise the entities. As such, the Authority is proposing various fee enhancements as outlined below. Comparative analysis to peer jurisdictions and the effective cost of supervision were taken into consideration in the design of the proposals.

Annual Business Fees (ABF) and registration fees

The long-term entities ABF and registration fees have historically been significantly lower than that of the general business entities, which reflected long-term insurance's lag in maturity and its smaller size in the past. Nevertheless, Bermuda's long-term insurance industry has now come of age, driven by a significant amount of growth in size and complexity. As such, an upward revision in ABF and registration fees is warranted to bring the amounts charged into the range of similar general business commercial entities. In addition, the BMA proposes a variable element to the fees in the top asset tier to ensure appropriate scaling with larger entities paying a proportionately larger amount of fees.

Category	Proposed fees
Class C insurer where total assets are expected to:	
not exceed \$50 million	\$50,000
exceed \$50 million but not exceed \$150 million	\$75,000

Category	Proposed fees
exceed \$150 million but not exceed \$350 million	\$150,000
exceed \$350 million but not exceed \$1 billion	\$210,000
exceed \$1 billion but not exceed \$3 billion	\$270,000
exceed \$3 billion but not exceed \$5 billion	\$380,000
exceed \$5 billion	\$430,000 + 0.001% for assets above \$5 billion
Class D and E insurer where total assets are expected to:	
not exceed \$500 million	\$270,000
exceed \$500 million but not exceed \$1 billion	\$300,000
exceed \$1 billion but not exceed \$3 billion	\$350,000
exceed \$3 billion but not exceed \$5 billion	\$380,000
exceed \$5 billion	\$430,000 + 0.001% for assets above \$5 billion

Note: These enhancements would exclude domestic insurers whose fees would be retained at the current level per the 2022 fees schedule.

Direct insurers (in addition to ABF)

Direct insurers who write retail business tend to have additional operational complexities (compared to reinsurers) and have some increased risks such as anti-money laundering risk and market conduct risk. All of these pose heightened risk to policyholders that warrant additional oversight from the BMA. The BMA proposes additional fees (in addition to the ABF) be charged to entities that write direct business as below:

Category	Proposed ABF
Class C, D and E insurers where total assets are expected to:	
not exceed \$100 million	\$30,000
exceed \$100 million but not exceed \$500 million	\$50,000
exceed \$500 million but not exceed \$5 billion	\$75,000
exceed \$5 billion	\$100,000

Proposed fees for insurers using the SBA

The use of the SBA in the computation of technical provisions provides entities with a principles-based framework that is reflective of the broad range of assets and liabilities that entities possess. The SBA is computationally complex; this, coupled with the fact that it is principle-based means that a significant amount of effort and technical expertise are required in the supervision of entities that use the SBA. To cover these costs, we are proposing introducing SBA-specific fees as follows:

SBA activity	Proposed fee
<p>Review and approval of an SBA model [Note: applications made hereunder shall be subject to a sliding scale fee payment as determined by the Authority, having regard to (1) the structural complexity of the SBA model, (2) the scale and complexity of assets/liabilities covered by the SBA model, (3) other items as deemed relevant by the Authority]</p>	<p>This is a one-time fee assessed on a case-by-case basis per the following formula:</p> <p>Min [Max [\$120,000, <i>0.0005</i>*(BEL using Standard Approach – BEL using SBA)] , \$1,500,000]</p>

SBA activity	Proposed fee
<p>SBA supervision annual fees</p> <p>The activities included under the fixed annual fee are:</p> <ul style="list-style-type: none"> • SBA-related on-site reviews • SBA-related prudential meetings conducted by the Authority • SBA off-site review and analysis conducted by the Authority on annual filings • Ad hoc SBA reviews as needed by registrants (e.g., on new transactions/deals) • To support all regulatory activities to be performed by the Authority in protecting the integrity of the BMA regulatory framework (e.g., in discussions with other regulators and policymakers) 	<p><u>Fixed annual fee:</u></p> <p>\$250,000</p>
<p>Approval to use 258E assets in BEL calculation</p>	<p>Initial approval: max [\$10,000, 0.0005 *(Vanilla SBA BEL – SBA BEL with 258E)]</p> <p>Renewal Annual Approval - \$10,000</p> <p><i>Vanilla SBA BEL = BEL without 258E/F</i></p>
<p>Approval to use 258F assets in BEL calculation</p>	<p>Initial approval: max [\$10,000, 0.0005 *(Vanilla SBA BEL – SBA BEL with 258F)]</p> <p>Renewal Annual Approval - \$10,000</p> <p><i>Vanilla SBA BEL = BEL without 258E/F</i></p>
<p>Approval for use of insurer-specific default cost assumptions (e.g., for private assets)</p> <p>Other SBA applications</p>	<p>Fixed application fee: \$15,000</p> <p>Renewal fee: \$10,000 every two years</p> <p>Fixed application fee: \$20,000</p>

Section 6D annual renewal fees

In the current fees structure first-time applications under section 6D are charged \$10,000 with a sliding scale to a maximum of \$200,000. Renewals, in turn, are charged \$1,000. Many of these applications are complex and material with renewals requiring close supervisory review and scrutiny, especially when an entity’s risk profile has evolved, or new elements have been introduced to the application. As such, the BMA proposes revising the annual renewal fees in line with the new section 6D framework as follows:

Section 6D route	Proposed fees – annual renewal
Route 1	\$10,000
Route 2	\$10,000
Route 3	<p>Renewal applications made hereunder shall be subject to a sliding scale fee payment as determined by the Authority, having regard to the scope and complexity of the review and the expected solvency impact of the application.</p> <p>Min [Max [\$10,000, 0.0005*(Capital requirement without the 6D approval – capital requirement with the 6D approval)] , \$100,000]</p>

IAIG

The global financial crisis and continued evolution and interconnectedness of the global economies emphasised the need to promote the efficient and effective supervision of IAIGs. In this regard, the IAIS launched several supervisory reforms geared toward strengthening collaboration among regulators, including the Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame), the ICS, and the Holistic Framework

for Systematic Risks (Holistic Framework). The ComFrame is a set of international standards focusing on the effective group-wide supervision of IAIGs.

In response to the above, the Authority has introduced several regulatory and supervisory changes over the last two years designed to ensure Bermuda’s IAIG regime is aligned with international standards and expectations while remaining fit for purpose for the Bermuda insurance market. These changes include amendments to the Insurance Act of 1978 related to the designation of an IAIG (Section 27H), designation of the head of IAIG (Section 27I) and recovery plan requirements (Section 6G). The Authority is also currently enhancing its Group supervisory framework with the introduction of IAIG supervision rules expected in 2023.

The efficient and effective supervision of IAIGs will have significant resource implications for the Authority. There is a need to develop additional tools and processes, including having dedicated resources with the right level of technical skills, knowledge and experience to execute additional supervisory tasks. As such, the BMA proposes the following fees for IAIGs that conduct long-term business:

Category	Proposed fees
Payable by the head of the IAIG on behalf of the IAIG where total assets at the preceding year-end to the year of assessment:	
i. Did not exceed \$50 billion	\$1,000,000
ii. Exceeded \$50 billion	\$1,000,000+ 0.0015% for assets above \$50 billion