



AMERICAN ACADEMY *of* ACTUARIES

Proposed Revisions to VM-20, PBR Requirements for Life Products

**Presented by
the American Academy of Actuaries' Life Reserves Work Group**

**To the National Association of Insurance Commissioners'
Life and Health Actuarial Task Force**

PBR Life Subgroup

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Proposed Revisions to the September Exposure Draft of VM-20

1) Change all references of “Subsection” to “Section”.

2) Add a new Section 4D(6)(c), which defines the test for dependence on the economic scenario (previously called the Material Tail Risk Test)

D. The Stochastic Reserve

(6). Stochastic testing exclusion

(c) The test for dependence of the reserve on the economic scenario requires calculating a scenario asset amount on 12 scenarios and using the results to calculate a ratio.

(i) The scenario asset amount is defined as the net present value of projected future cash flows following the method defined in Section 4D(3)(b). For purposes of this test, grouping of policies is permitted. The path of discount rates specific to each scenario is equal to the corresponding path of Net Asset Earned Rates, and is specific to each scenario.

(ii) The 12 scenarios shall be based on specified patterns of random shocks to the economic conditions on the projection start date.

I. The scenarios will be generated by a process approved by the NAIC or the commissioner.

II. If the specified scenarios are not available on the projection start date, the company shall use the specified scenarios from the most recent date prior to the projection start date.

III. One of the scenarios is referred to as the baseline economic scenario, and it is based on random shocks of zero.

(iii) The experience assumptions used within each scenario shall be Prudent Estimate Assumptions. Experience assumptions should be dynamically adjusted as appropriate to be consistent with each tested scenario.

(iv) The test ratio is equal to $(b-a)/c$ where a, b, and c are defined as follows:

a = The scenario asset amount in the baseline economic scenario.

b = The largest scenario asset amount in any of the other 11 scenarios.

c = An amount, calculated from the baseline economic scenario, that represents the present value of benefits and expenses for the policies, adjusted for reinsurance as appropriate to achieve consistency between the

numerator and denominator. For this purpose, the company shall generally use the present value of cash flows defined in Section 4C(3)(b) for the policies, excluding the gross premium payments as defined in paragraph (v) and excluding as appropriate the corresponding portion of such gross premium payments reflected in reinsurance cash flows in paragraphs (viii) and (ix).

Drafting Note: As an example of the portion of gross premium payment excluded from reinsurance cash flows, for policies reinsured through a modified coinsurance arrangement where the policy premium is substantially returned to the ceding company through a reserve transfer, the ceding company would not need to reduce this amount for the gross premiums reflected in the reinsurance cash flows.

(v) To pass the test, the ratio must be less than X%

Drafting Note: The value of X will be determined by the NAIC. The LRWG is developing a report that will assist the NAIC in this determination.

(vi) The test shall be carried out annually to continue to qualify for the stochastic testing exclusion, and shall be done within the 12-month period prior to the valuation date.

(vii) Contract types with significantly different risk profiles should not be grouped together for purposes of this test.

3. Add a new Section 9C, which defines the prescribed gross spread for reinvestment assets. Note that the September draft made reference to prescribing NET spreads on reinvestment assets. This approach prescribes the GROSS spread, and requires Prudent Estimate assumptions for default costs and investment expenses.

C. Prescribed Gross Spreads on Reinvestment Assets over Treasuries for reinvested assets shall be determined as follows:

(1) Linearly grade the current gross spread on Reinvestment Assets as of the projection start date to the ultimate prescribed gross spread over three (3) years for the following four (4) asset types:

- | | |
|---|----------------|
| a. 10-year AAA public non-callable corporate bond | W basis points |
| b. 10-year AA public non-callable corporate bond | X basis points |
| c. 10-year A public non-callable corporate bond | Y basis points |
| d. 10-year BBB public callable corporate bond | Z basis points |

Drafting Note: The values of W, X, Y and Z shall be determined by the NAIC based on a study of historical averages. One possibility is to define W, X, Y and Z in terms of a constant plus a component that varies with the level of Treasury rates in the projection interval. This would allow spreads to change over time as interest rates change.

2) The source of the gross spreads as of the projection start date for the four (4) asset types in Section 9(C)(1) shall be << insert source to be determined by the NAIC >> or alternately, the company may determine the gross spreads as of the projection start date provided that the company provides appropriate documentation, including a widely recognized source for such determination in the PBR Actuarial Report.

- (3) The company shall use the prescribed ultimate gross spread for Reinvestment Assets for the above four asset classes in year 4 of the projection and for all subsequent years.
- (4) The company shall adjust the prescribed ultimate gross spreads defined in Section 9(C)(1) for Reinvestment Assets for all other asset classes to reflect anticipated gross spread levels that are consistent with the four prescribed values, but that reflect differences for such things as:
 - a. Different quality ratings (e.g. AA-, A+, etc.)
 - b. Different tenor (e.g., 5 year bond, 15 year bond, etc.)
 - c. Different asset types (e.g. commercial mortgages, private placement bonds, etc.)
- (5) When determining the adjustments to the prescribed gross spreads described in paragraph 3 above, the actuary shall be guided by the following:
 - (a) The adjustments shall reflect differences between asset types for specific risks, such as prepayment for RMBS, illiquidity for privates and commercial mortgages, etc.
 - (b) The net spread on Reinvestment Assets (i.e., the gross spread after deductions for default costs and investment expenses) for bonds rated below BBB- (and equivalent ratings for other asset types) shall not be greater than the net spread determined for BBB- rated assets. For assets that don't have an external rating, the company shall use its internal rating for the purpose of this paragraph.

Drafting Note: Further work is needed to determine if additional guidance is needed in this section to determine these adjustments since specific guidance is expected to be included in the PBR ASOP and/or the PBR Practice Note.

- (6) The company shall include in the PBR Actuarial Report a summary of the gross spreads used for reinvestment assets, and a description of the approach used to determine the adjustments described in paragraph 3.

4. Replace the entire Section 6, which defines the approach to determine Prudent Estimate mortality assumptions. The primary change is adding a simplified method for blocks of policies whose mortality experience has low credibility. The changes also require adding/revising three terms that will be added to the Definitions section of VM-20. We also reorganized and clarified the description of the current method to determine mortality assumptions.

New Definitions for Section 3:

- 1) “Credibility Segment” means a group of policies subject to the same level of underwriting and same risk classification procedures that are grouped together for the purpose of determining whether the policies qualify for the simplified method to determine Prudent Estimate mortality assumptions described in subparagraph A(2)(a) of Section 6.
- 2) “Mortality Segment” means a subset of policies from a Credibility Segment for which a separate mortality table representing the Prudent Estimate assumption will be determined.
- 3) “Mortality Experience Cell” means a subset of policies from a Mortality Segment that are grouped together when determining Credibility Adjusted Experience Rates.

Revised Section 6: Requirements for Setting Mortality Assumptions

- A. Procedure for setting Prudent Estimate mortality assumptions
- (1) Determine the company's Credibility Segments and Mortality Segments, as described in paragraph B below.
 - (2) Apply the Credibility Criterion described in paragraph C below to each Credibility Segment to determine if the Credibility Segment qualifies for the simplified method to determine Prudent Estimate mortality assumptions.
 - (a) If the mortality experience of the Credibility Segment does not meet the minimum credibility level defined by the Credibility Criterion, the company shall use the following simplified method to determine Prudent Estimate mortality assumptions:
 - (i) Use the underwriting scoring procedure described in paragraph E below to determine the applicable Valuation Basic Table.
 - (ii) Set the Prudent Estimate mortality assumption for each Mortality Segment within the Credibility Segment equal to the mortality rates in the Commissioners' Table that correspond to the applicable Valuation Basic Table determined in (i) above.
 - (b) If the mortality experience of the Credibility Segment meets or exceeds the minimum credibility level defined by the Credibility Criterion, the company shall use the following procedure to determine the Prudent Estimate mortality assumption for each Mortality Segment within the Credibility Segment:
 - i. Select a credibility procedure meeting the requirements of paragraph D below.
 - ii. Use the underwriting scoring procedure described in paragraph E below to determine which of the Valuation Basic Tables shall serve as the industry table for that Mortality Segment required by the selected credibility procedure.
 - iii. Determine the mortality experience rates and apply the selected credibility procedure to determine Credibility Adjusted Experience Rates, as provided in paragraph F below.
 - iv. Determine Margin as provided in Section G below.
 - v. Set the Prudent Estimate mortality assumption to equal the corresponding rates in that Commissioners' Table for which the Seriatim Reserve for the Mortality Segment is nearest to, but not less than, the Seriatim Reserve based on the Credibility Adjusted Experience Rates increased by the Margin.
 - (3) Adjust the Prudent Estimate mortality assumptions determined in paragraph (2) above to reflect differences associated with impaired lives, or if there is a reasonable expectation that due to conditions such as changes in premiums or other policy provisions, policyholder behavior will lead to mortality results that vary from the mortality results that would otherwise be expected.
 - (a) The adjustment for impaired lives shall follow established actuarial practice, including the use of mortality adjustments determined from clinical and other data.
 - (b) The adjustment for policyholder behavior shall follow accepted actuarial practice, including the use of dynamic adjustments to base mortality.

B. Determination of Credibility Segments and Mortality Segments

- (1) The company shall group policies into Credibility Segments for the purpose of determining whether the policies qualify for the simplified method of determining mortality assumptions described in subparagraph A(2)(a) of Section 6.
 - a. Policies within a Credibility Segment generally should have similar underwriting and mortality experience characteristics. When these characteristics are similar for policies having various plans of insurance, the company may group the policies into the same Credibility Segment.

Drafting Note: It is anticipated that most companies will define a Credibility Segment to be a block of policies with similar underwriting rules, such as guaranteed issue, or regularly underwritten policies.

- b. The company shall remove from the Credibility Segments any policies for which the experience is reflected through adjustments to the Prudent Estimate mortality rate assumptions under subparagraph A(3), including policies insuring impaired lives and those for which there is a reasonable expectation, due to conditions such as changes in premiums or other policy provisions, that policyholder behavior will lead to mortality results that vary significantly from those that would otherwise be expected.
- (2) The company shall group policies into Mortality Segments, each consisting of a group of policies within a Credibility Segment for which a separate mortality table representing the Prudent Estimate assumption will be determined.

C. Determination of the credibility of mortality experience

The company shall apply the Credibility Criterion defined in subparagraph (2) below to the mortality experience of each Credibility Segment to determine if the experience meets a defined minimum credibility level. For those Credibility Segments that fall below the minimum credibility level, the simplified method to determine the Prudent Estimate mortality assumption for those segments defined in Paragraph A(2)(a) of Section 6 shall be used.

- (1) The mortality experience to which the Credibility Criterion is applied shall be determined as follows:
 - (a) The company shall use actual experience data directly applicable to the Credibility Segment if available.
 - (b) The company may use actual experience data of one or more mortality pools in which the policies participate under the terms of a reinsurance agreement, provided that the policies in the Credibility Segment have underwriting and mortality experience characteristics similar to those of the policies in the pool and the aggregate pool data required to carry out the requirements of this paragraph C are available to the company.
 - (c) If actual experience data is not available or has limited credibility, the company may use data from other sources if available and appropriate. For purposes of this subparagraph (1), data from other sources is appropriate if the source has underwriting and mortality experience characteristics that are similar to policies in the Credibility Segment and the data is directly measured (as opposed to determined by extrapolation or other indirect procedure).
 - (d) The company shall update the mortality experience described in (a), (b) and (c), whether based on actual experience or data from other sources, at least

every three years; however, whenever updated experience data becomes available, the company shall reflect changes implied by the updated data to the extent such changes are significant and are expected to continue into the future. More frequent updates should result in lower Margins under paragraph G below.

- (2) The company shall apply the Credibility Criterion defined below to the experience identified in subparagraph (1) above to determine whether the experience of the Credibility Segment meets the minimum credibility level.

<<insert definition of criterion>>

Drafting Note: The Credibility Criterion will be defined based on a specified method that will be simple to apply. Alternatively, the Credibility Criterion could be defined generically, so that the company-chosen credibility procedure would yield the Criterion. This would require reordering of these provisions. The Credibility Criterion will include a definition of a minimum level of credibility to determine if the Credibility Segment as a whole qualifies for the simplified method to determine Prudent Estimate mortality assumptions. It is anticipated that this minimum level of credibility will be something greater than a 0% credibility level – but at a low percentage of partial credibility.

D. Selection of credibility procedure

If the experience of any Credibility Segment meets or exceeds the minimum credibility level under the provisions of paragraph C above, the company shall select a credibility procedure that meets the following requirements:

- (1) The credibility procedure shall describe the method by which the experience rates for a Mortality Experience Cell or for groups of Mortality Experience Cells are blended with appropriate industry experience to produce Credibility Adjusted Experience Rates for each Cell.
- (2) The credibility procedure shall satisfy the following statistical criteria:

Drafting Note: The specific criteria should be specified. The NAIC may wish to request a recommendation from the American Academy of Actuaries. The criteria are likely to be updated from time to time.

- (3) The credibility procedure shall be consistent with accepted actuarial practice.
- (4) For Mortality Experience Cells or groups of Mortality Experience Cells that have 100% credibility, the credibility procedure shall set the Credibility Adjusted Experience Rates equal to the actual experience rates for the Cell or group of Cells.

E. Application of the underwriting scoring procedure

- (1) The company shall apply the underwriting scoring procedure described in subparagraph (2) below to determine:
 - (a) The applicable Valuation Basic Table for Mortality Segments within those Credibility Segments that qualify for the simplified method to determine Prudent Estimate mortality assumptions as described in Paragraph A(2)(a) of Section 6; and
 - (b) The Valuation Basic Table that shall serve as the industry table under the selected credibility procedure for Mortality Segments within those Credibility Segments that do not qualify for the simplified method to

determine Prudent Estimate mortality assumptions as described in Paragraph A(2)(a) of Section 6.

- (2) The underwriting scoring procedure is as follows:

<<insert the source of the underwriting scoring procedure, and any guidance as to how to apply the scoring procedure >>

Drafting Note: The underwriting scoring procedure is under development. It is expected that each of several risk characteristics will affect an overall score in a way that reflects the effectiveness of the company's treatment of that characteristic. In addition to applying the underwriting scoring, the procedure described in this subparagraph (1) must take into account factors that are not recognized in the underwriting scoring and must be applicable to policies that are issued subject to simplified underwriting and policies that are issued without underwriting.

- (3) The company shall determine the Valuation Basic Table for each Mortality Segment from the results of the underwriting scoring procedure as follows:

Drafting Note: The manner in which the underwriting score and other factors beyond the score are used to select a Valuation Basic Table is still to be determined.

- (4) If no Valuation Basic Table appropriately reflects the risk characteristics of the Mortality Segment, the company may use any well-established industry table that is based on the experience of policies having the appropriate risk characteristics in lieu of a Valuation Basic Table.

Drafting Note: Subparagraph (4) is intended to provide flexibility needed to handle products based on group-type mortality, etc., for which there might not be a Valuation Basic Table.

F. Determination of Experience Rates and Credibility Adjusted Experience Rates

- (1) For each Mortality Experience Cell or group of Cells specified by the company's credibility procedure, the company shall calculate mortality experience rates based on the experience data identified in subparagraph C(1) above.
- (2) The company may adjust the mortality experience rates for each Mortality Experience Cell or group of Cells to reflect the expected incremental change due to the adoption of risk selection and underwriting practices different from those underlying the experience data identified above, provided that:
- (a) the adjustments are supported by published medical or clinical studies; and
 - (b) the rationale and support for the use of the study and for the adjustments are disclosed in the PBR Actuarial Report.

Drafting Note: It is anticipated that such adjustments to experience will rarely be made. Since these adjustments are expected to be rare, and since it is difficult to anticipate the nature of these adjustments, the commissioner may wish to determine the level of documentation or analysis that is required to allow such adjustments. The NAIC may want to consider whether approval by a centralized examination office would be preferable to approval by the commissioner.

- (3) The company shall determine Credibility Adjusted Experience Rates using the credibility procedure selected in accordance with paragraph D above.

- (4) The appropriate industry experience to be used in conjunction with the credibility method shall be the Valuation Basic Table or appropriate weighted average of Valuation Basic Tables determined in paragraph E above for the Mortality Segment or the Mortality Segments to which the Mortality Experience Cell or Cells belong. Adjustments to the Valuation Basic Tables may be prescribed by the commissioner to reflect intercompany studies made subsequent to the adoption of the Commissioners' Table and appropriate mortality improvement from the effective date of the resulting table to the experience weighted average date underlying the data used to develop the experience mortality rates.
- (5) If experience data by age and duration only exist for some of the Mortality Experience Cells within a Mortality Segment, the Credibility Adjusted Experience Rates for the Cells where data exist shall be graded into the applicable industry mortality table rates over 10 years (e.g., over 10 attained ages or over 10 durations during the select period, as applicable) to produce Credibility Adjusted Rates for the remainder of the Segment. The grading must be reasonable and consistent with accepted actuarial practice. The grading shall take into account the level of partial credibility, the trend in actual to expected ratios, the shape and level of the resulting mortality rates, and the reasons for differences in mortality results relative to industry mortality rates such as differences in underwriting, market and other factors.
- (6) The Credibility Adjusted Experience Rates shall reflect mortality improvement up to the projection start date based on applicable published industry-wide experience. The adjustment made shall be for the period from the experience weighted average date underlying the company experience used in the credibility process to the projection start date.

G. Determination of Margin.

- (1) For each Credibility Segment that qualifies for the simplified method to determine Prudent Estimate mortality assumptions as defined in Paragraph A(2)(a) of Section 6, the Margin shall equal the respective differences between the rates obtained from the applicable Commissioners' Table and the corresponding rates obtained from the associated Valuation Basic Table.
- (2) For each Credibility Segment that does not qualify for the simplified method to determine Prudent Estimate mortality assumptions as defined in Paragraph A(2)(a) of Section 6, the company shall determine a Margin, consistent with subparagraph E(6) of Section 4, to add to the Credibility Adjusted Experience Rates determined in paragraph F of this Section.
- (3) The Margins determined in subparagraph (2) above shall be increased to reflect situations involving greater uncertainty, including but not limited to the following:
 - (a) The reliability of the company's experience studies is low due to imprecise methodology, length of time since the data was updated or other reasons. The longer the time since the experience data was updated, the larger the Margin.
 - (b) The underwriting or risk selection risk criteria associated with the Mortality Segment have changed since the experience on which the Credibility Adjusted Experience Rates are based was collected.
 - (c) The data underlying the Credibility Adjusted Experience Rates lack homogeneity.

- (d) Unfavorable environmental or health developments are unfolding and are expected to have a material and sustained impact on the insured population.
 - (e) The company's marketing or administrative practices or market forces (for example, the secondary market for life insurance policies) expose the policies to the risk of anti-selection.
- H. For purposes of disclosure of aggregate and individual Margins as required by Section 4E(7)(a), the Anticipated Experience Assumption for mortality shall be:
- (1) For Mortality Segments that qualify for the simplified method to determine Prudent Estimate mortality assumptions as described in Paragraph A(2)(a) of Section 6, the applicable Valuation Basic Table.
 - (2) For Mortality Segments that do not qualify for the simplified method to determine Prudent Estimate mortality assumptions as described in Paragraph A(2)(a) of Section 6, the Credibility Adjusted Experience Rates.
- I. Special Reporting and Documentation Requirements Related to Mortality Assumptions
- The following items shall be included in the PBR Actuarial Report:
- (1) If experience mortality rates for any Mortality Segment are not based on the experience directly applicable to the Mortality Segment (whether or not the data source is from the company), then provide a summary containing the following:
 - (a) The source of data including a detailed explanation of the appropriateness of the data, and the underlying source of data, including how the experience mortality rates were developed, graduated and smoothed;
 - (b) Similarities or differences noted between policies in the Mortality Segment and the policies from the data source (e.g., type of underwriting, marketing channel, average policy size, etc.);
 - (c) Adjustments made to the experience mortality rates to account for differences between the Mortality Segment and the data source;
 - (d) The number of deaths and death claim amounts by major grouping no broader than those allowed for direct company data and including: age, gender, risk class, policy duration and other relevant information.
 - (2). If the company makes adjustments to the experience mortality rates as described in Section 5F(2), a summary of the following items:
 - (a) The rationale for any adjustment;
 - (b) Description and summary of any studies used to support an adjustment;
 - (c) Documentation of the mathematics used to adjust the mortality;
 - (d) Summary of any other relevant information concerning any adjustments to the experience mortality that affected the mortality assumption.

- (3) A summary of the following items that support the credibility procedure used:
 - (a) Description and rationale for the credibility procedure used;
 - (b) Explanation of the credibility analysis used to adjust experience mortality rates;
 - (c) To the extent the company has changed the credibility procedure (or procedures and values for determining partial credibility) from the prior valuation date, disclosure of the rationale for the change and an estimate of the impact on the Reported Reserve of the change.
- (4) A summary of the rationale and results of the analysis used in the selection of the Valuation Basic table(s) for credibility weighting (if applicable).
- (5) A summary of the rationale and support for any adjustment to mortality described in paragraph 6A(3).
- (6) A description of the rationale and results of the analysis used in the selection of the Commissioner's Table.
- (7) An actual to expected analysis at least once every three years.

5. Expand paragraph 4D(6)(d) to include a description of the exceptions to the prohibition of electing the stochastic modeling exclusion if the company follows a clearly defined hedging strategy.

D. The Stochastic Reserve

- (6) Stochastic testing exclusion
 - (d) A group of policies for which there is one or more Clearly Defined Hedging Strategy(s) shall not be eligible for the stochastic modeling exclusion with the following current exceptions:
 - (i) Derivative programs whereby the company executes a future series of cash flow hedges, such as the execution of swaps coincident with the purchases of certain bond investments such that the payment frequency and basis of the periodic swap payments exactly match those of the stated coupons to be received on the bond investments (in which case the swap and the bond will often be modeled on a combined basis), or
 - (ii) Derivative programs that solely involve the purchase of options that provide an effective hedge for the indexed credits on a group of indexed universal life policies, taking into account the market liquidity for the options needed to match such indexed credits, or
 - (iii) If approved by the domiciliary commissioner.

The above exception cases must still meet the requirements of Subsection 4(D)(6)(a) in order to be excluded from stochastic modeling, and the

residual risk exposure resulting from the derivative programs must be reflected in one of the two exclusion methods provided.

In addition, future transactions associated with non-hedging derivative programs may not be reflected in the reserve calculation for groups of policies for which the stochastic modeling exclusion is elected.

Drafting Note: The exception list may need updating from time to time.

6. Revisions to Section 4I, which defines the approach to model non-guaranteed elements. The intent of these changes is to clarify the approach to model NGE, due to confusion expressed by some on the current wording. The tracked changes are from the September exposure draft of VM-20.

I. Treatment of Non-Guaranteed Elements.

- (1) Include Non-guaranteed elements in the models used to project future cash flows for both the Deterministic Reserve and the Stochastic Reserve. Where NGE are based on some aspect of experience, reflect future changes in the level of NGE in the cash flow models based on the experience assumed in each Scenario. ~~The intent is to model the determination of NGE as the company would actually set them if experience unfolded in a manner consistent with the Scenario under consideration, but reflecting a Margin for uncertainty as described below.~~
- (2) As would be the case in actual practice, do not assume that the projected NGE change simultaneously with the change in projected experience, but only at the date following the recognition of a change in experience on which the company would normally implement a change.
- (3) When determining the projected NGE ~~assumption~~ for each Scenario, take into consideration those factors that ~~could cause~~ affect how the company ~~to~~ will modify its current NGE scale ~~and/or its current NGE spreads~~, such as existence of contract guarantees, the company's past NGE practices and current NGE policies.
- (4) Establish a Margin ~~on~~ for the projected NGE ~~assumption~~ that increases the Reported Reserve compared to the Reported Reserve that would result ~~from assuming that each non-guaranteed element equals the experience of the Scenario plus 100% of the current NGE Spread. Factors that must be considered when determining the~~ without a Margin ~~include~~:
 - (a) ~~The company's ability to modify its non-guaranteed element scale and/or NGE Spreads, and the company's past NGE practices and current NGE policies;~~
 - (b) ~~Impact on policyholder behavior of maintaining the current non-guaranteed element scale and/or NGE Spreads under the Scenario;~~
 - (c) ~~Impact of the NGE assumption on the competitive position of the product under the Scenario;~~
- (5) Report any liability for dividends declared but not yet paid that has been established according to statutory accounting principles as of the valuation date

separately from the Reported Reserve. Accordingly, where such a separate liability is reported on the statutory balance sheet as of the valuation date, exclude any dividends that are included in the separate liability from the reserve cash flow projection.

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