

# PBR Impact to Annuities

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# PBR IMPACT TO ANNUITIES

Variable annuities

May, 2020

Josh Chee, FSA, MAAA

# AGENDA

**01** VA statutory reserving background

**02** VM-21 overview  
Stochastic | Standard projection | C3 charge

**03** Key takeaways

# **SECTION 1**

**VA STATUTORY RESERVING BACKGROUND**

# VA STATUTORY REFORM BACKGROUND

VA Statutory requirements have evolved from a formulaic approach to the current PBR framework

## 1 Formulaic reserves

- Reserves were formulaic (AG 33, AG 34 and AG 39)
- RBC was factor-based
- Did not reflect market risks inherent in variable annuities, particularly with regard to GMxBs
- Did not reflect company-specific portfolio risks, hedging practices and the degree of ALM mismatch

## 2 PBR introduction

- C 3 Phase II enacted in 2006
- AG 43 enacted in 2009
- Both are principle-based approach utilizing stochastic projections, subject to a standard scenario floor
- Attempts to address equity risk, interest rate risk and expense recovery risk associated with VA's
- Key shortcomings surfaced over time and caused companies to seek captive solutions

## 3 PBR refinement

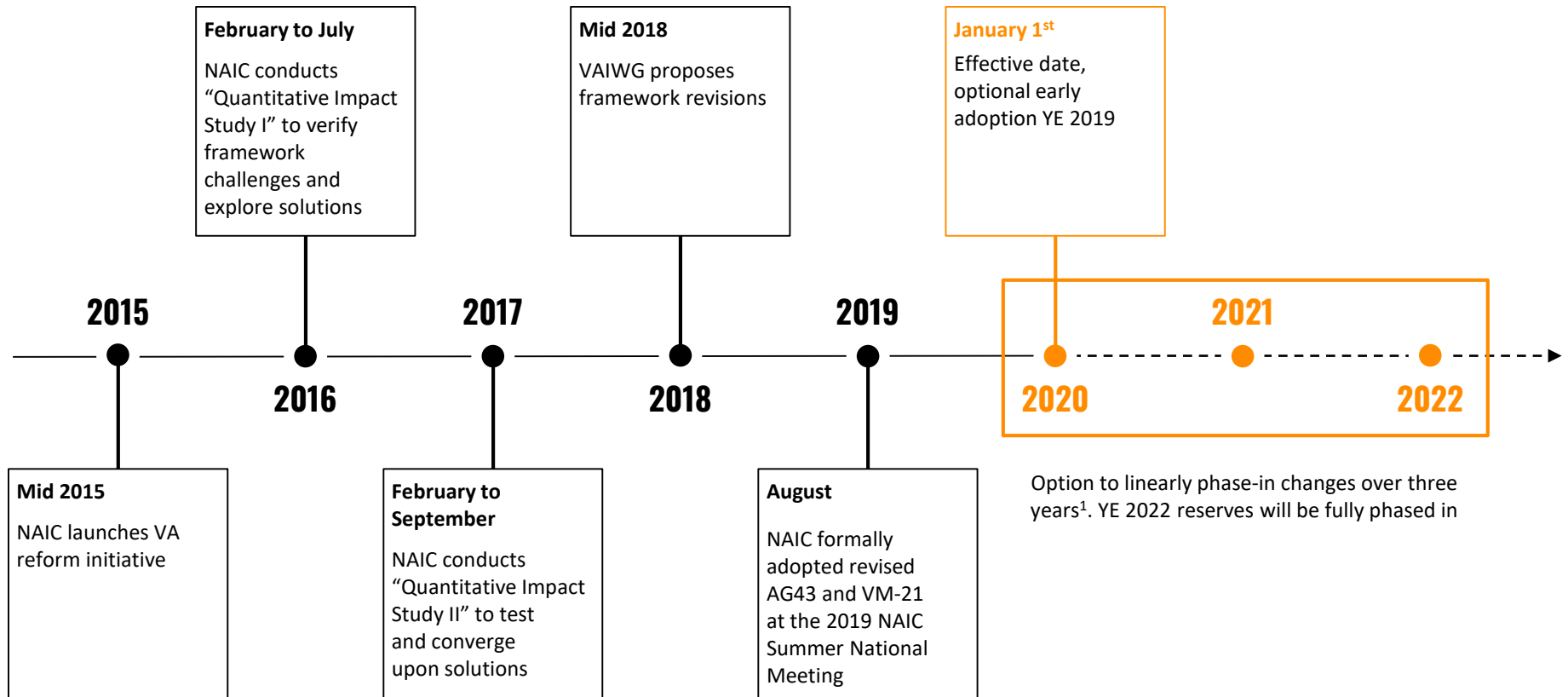
- Revised statutory reserve (VM-21) and C3 framework, effective 1/1/2020
- Revisions address key issues in the prior framework while largely maintaining the AG 43 statutory construct

Past

Present

# VA STATUTORY REFORM TIMELINE

VM-21 is the result of a multi-year NAIC initiative to improve VA statutory accounting



1. Company may elect a longer phase-in period, up to 7 years, with approval of domiciliary commissioner

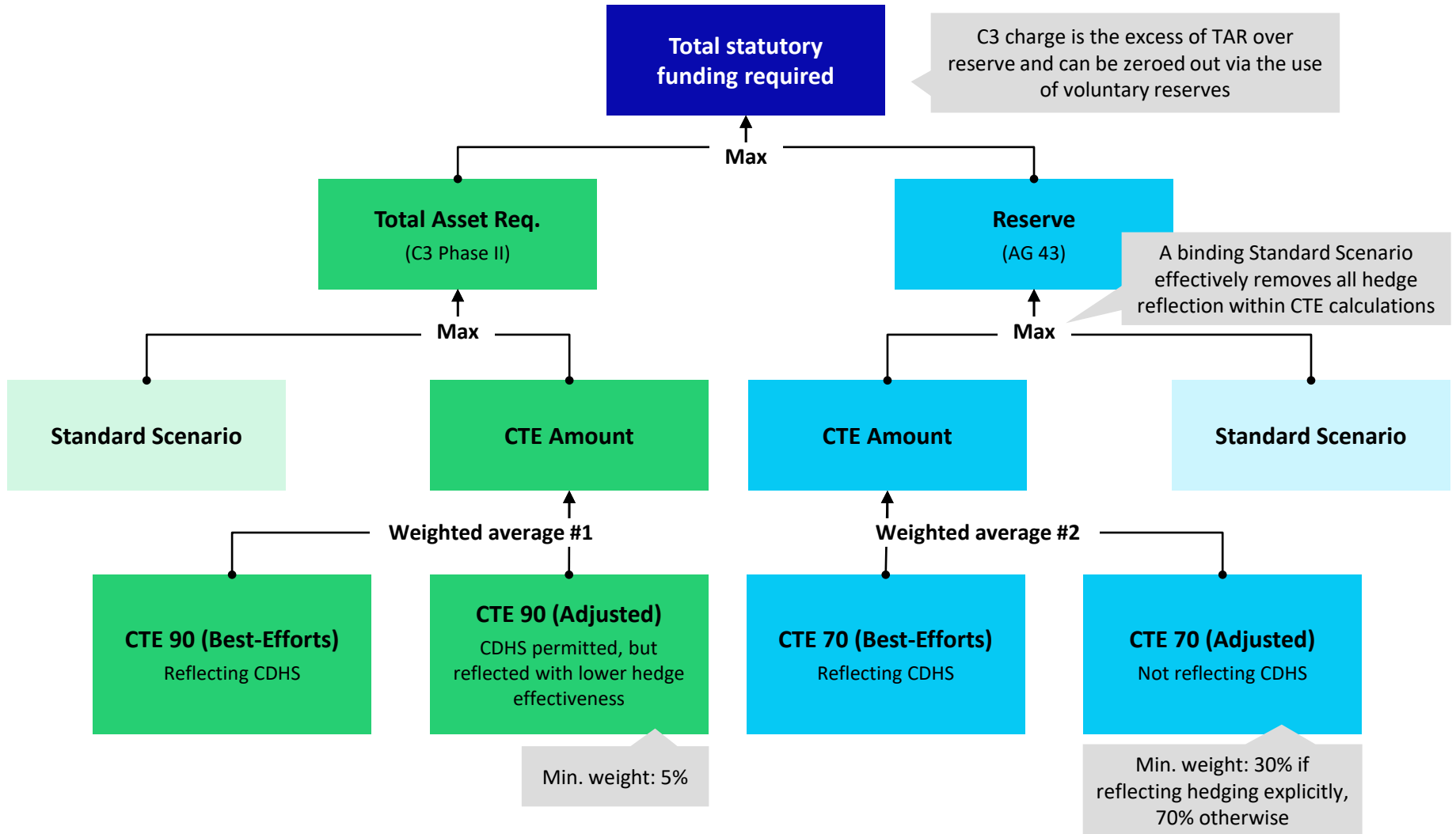


# **SECTION 2**

## **VM-21 OVERVIEW**

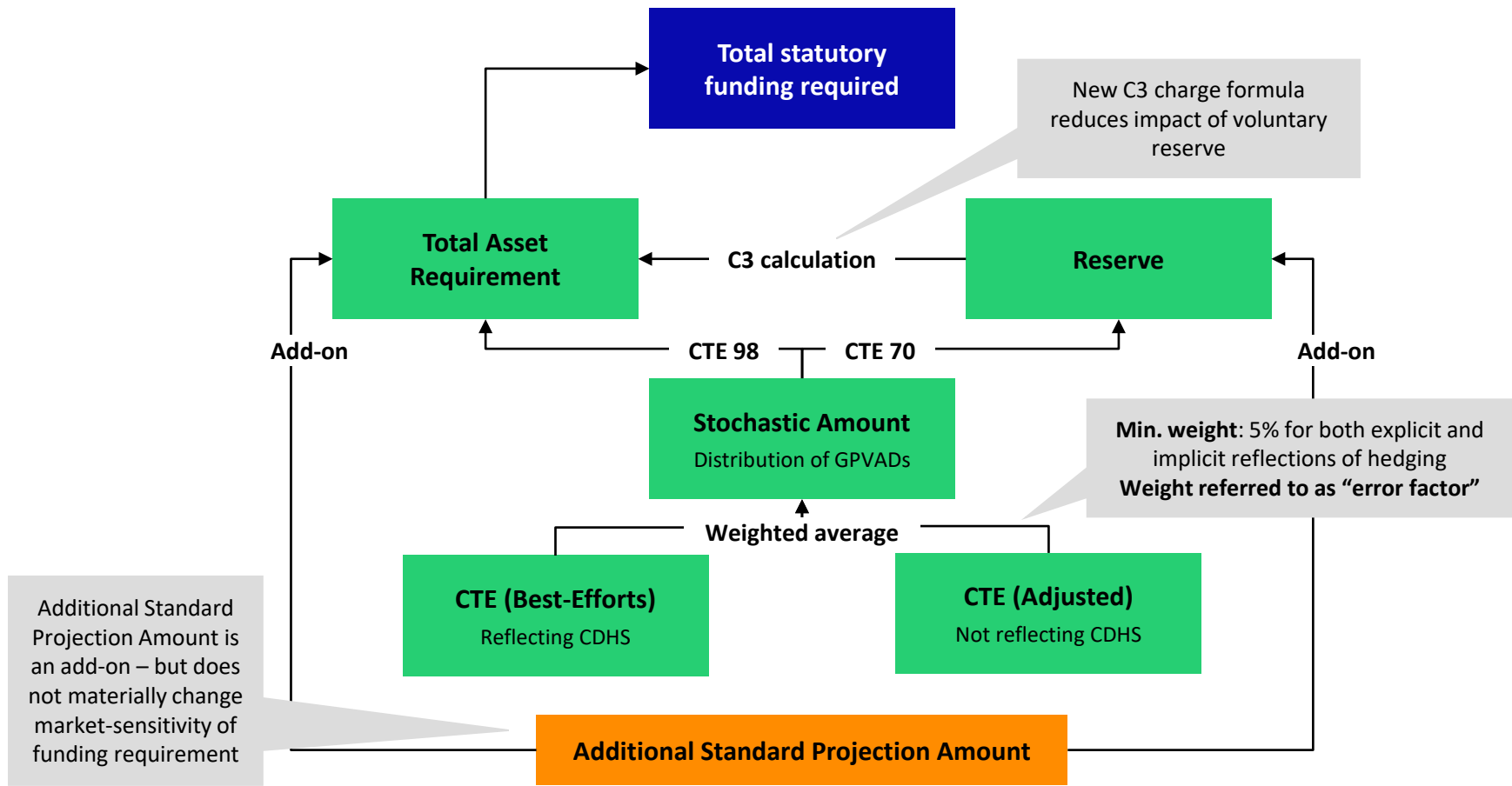
# PRIOR VA STATUTORY FRAMEWORK

Structural misalignments between the stochastic and standard scenario and between AG 43 and C3 Phase II produced unintended results



# REVISED VA STATUTORY FRAMEWORK

Standard projection is aligned with CTE adjusted; reserve and TAR follow the same stochastic distribution



Revised framework reduces disincentive to hedging and lowers balance sheet volatility with better alignment between asset and liability

# SUMMARY OF VM-21 UPDATES

High level categories

## 01

### Stochastic (CTE)

- Remove working reserves when calculating scenario GPVAD
- Discount deficiencies at net asset earned rate on additional assets
- Use VM-20 scenario generator for interest and SA returns; only allow proprietary scenario generator when it does not materially reduce TAR
- Introduce principles to govern implied volatility scenario generation
- Follow VM-20 guidance on GA asset projection
- Permit immediate liquidation of current hedges in CTE “adjusted” and non-reflection of MTM hedge gains or losses
- Reduce minimum allowable CDHS “error factor” but require back-testing for chosen factor
- Align conservatism margin for reflecting non-guaranteed revenue sharing income with historical experience

## 02

### Standard projection

- Align AG43’s standard scenario calculations with CTE “adjusted”
- Refresh prescribed policyholder behavior assumptions to align with industry experience
- Use the additional standard projection amount construct to govern model choices and actuarial assumptions only
- Project the standard projection on an aggregated basis
- Calculate the standard projection amount based on company-specific market paths, select from a panel of standardized paths
- Allow the standard projection amount to be calculated as a CTE amount with prescribed assumptions

## 03

### C3 & other topics

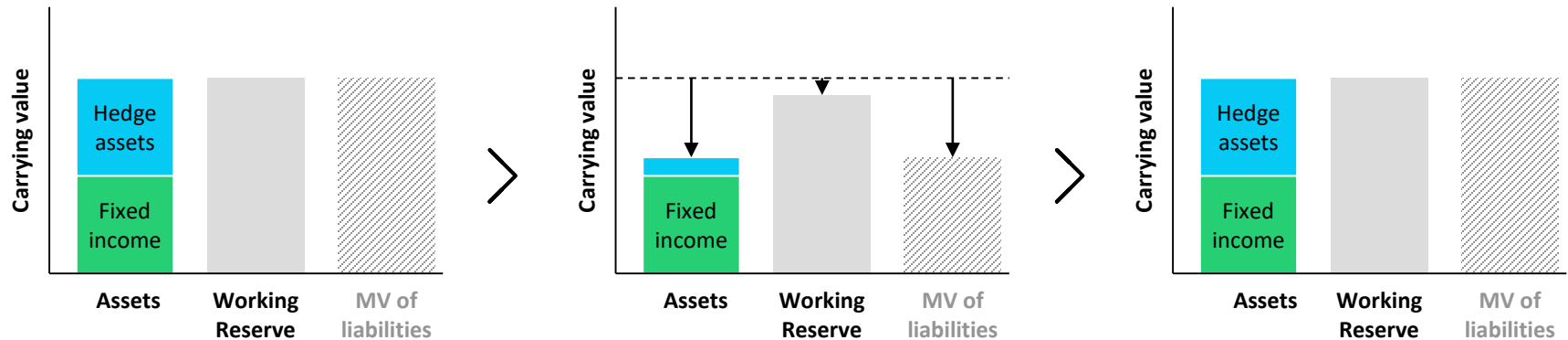
- Calculate C3 as difference between total statutory reserve and CTE 98 on same distribution
- Remove C3 Phase II standard scenario
- Permit smoothing to be conducted on the C3 charge, but not on TAR
- Various disclosure requirement changes

# REMOVE WORKING RESERVE FROM THE GPVAD CALCULATION

Under the prior framework, changes in the market conditions resulted in B/S volatility as hedge gains and losses were not offset by change in Working Reserve



## Projected balance sheet under the existing framework



- Insurer hedges on a FV basis; hedge losses offset decrease in FV of liabilities
- Statutory reserves are less market-sensitive and respond more slowly
- Creates a large deficiency in market conditions favorable to the liability

- Carrying value of assets and liabilities return to levels close to time-0 values
- However, point of greatest accumulated deficiency may have already been reached by previous hedge cash flows

The revised statutory framework removes the Working Reserve from the projection and aligns more closely to other statutory reserve frameworks like VM-20 and Cash Flow Testing

# DISCOUNT RATES FOR ACCUMULATED DEFICIENCIES

Net asset earned rate (NAER) on additional assets is used to calculate the greatest present value of accumulated deficiency (GPVAD)

## Prior framework

- AG 43 guidance is relatively ambiguous with respect to the starting asset amount and the discount rate for deficiencies
- As a result, two different practices are observed in industry:

Approach	Implied assets backing reserves
<b>A</b> Set starting assets as CSV or prior quarter's reserves, then add the CTE 70 of GPVADs	Starting assets included in projection, plus cash available for immediate reinvestment
<b>B</b> Iteratively solve for starting assets such that the CTE 70 of GPVADs is zero	Assets modeled in the final iteration of starting assets



## Revised framework

- Allow both approaches, but require accumulated deficiencies to be discounted at the **Net Asset Earned Rate** on Additional Assets
- NAER is defined as earned rate on a “closed portfolio” of general account assets available on the valuation date that do not constitute a part of starting assets
- Intended to capture reinvestment, in line with the company's investment policy, of coupon and maturity payments of the initial additional asset portfolio
- NAER provides an approximation of approach B without requiring computationally-intensive starting asset iterations

Revised methodology promotes more accurate reflection of ALM and yield characteristics of assets, and aligns practices across the industry and with VM-20

# CHANGES TO SCENARIO GENERATION

Revised framework promotes greater consistency and comparability for market participants

VM-21 change	Details	Outcomes/implications
<b>01</b> Use VM-20 generator for interest rates	<ul style="list-style-type: none"> <li>VM-20 scenario generator (ESG) and mean reversion parameter (MRP) are prescribed</li> </ul>	<p>Long-term interest assumption varied significantly between participants; prescribing an ESG and MRP promotes consistency across companies</p>
<b>02</b> Use VM-20 generator for separate account returns	<ul style="list-style-type: none"> <li>VM-20 scenario generator is prescribed, using the same parameters as those used in VM-20</li> <li>Require separate account funds to be mapped to a combination of funds from VM-20 generator</li> </ul>	<p>The VM-20 MRP is informed by prevailing conditions and reacts to historical changes in interest rates</p>
<b>03</b> Allow proprietary ESG if and only if they do not materially reduce TAR	<ul style="list-style-type: none"> <li>Proprietary generator allowed if – and only if – TAR produced is not materially less than that produced using a prescribed generator</li> </ul>	<p>Limiting use of other ESGs decreases risk of material reduction in reserves due to scenario differences</p>
<b>04</b> Introduce principles to govern implied volatility, with a prescribed “safe harbor” approach	<ul style="list-style-type: none"> <li>Projected implied volatility surface must be arbitrage-free</li> <li>Relationships between implied volatility, realized volatility, and short-term asset performance should be consistent with historical data</li> <li>Any realized “spread” between projected implied and realized volatility should not decrease the TAR</li> </ul>	<p>Prior framework does not provide adequate guidance on projecting implied volatility</p> <p>Revised framework prevents inappropriate scenario generation from producing unrealizable hedge benefits in tail scenarios</p>

# CHANGES TO ASSET AND LIABILITY PROJECTIONS (1/2)

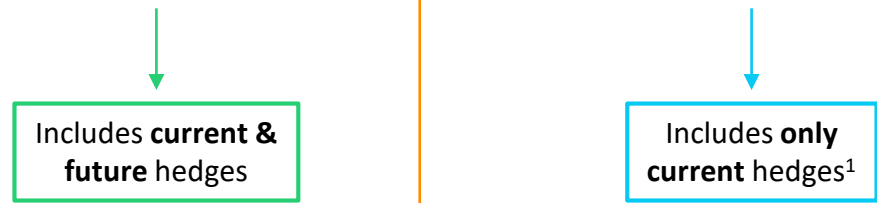
VM-21 changes	Details	Outcomes/implications
<b>01</b> Follow VM-20 guidance on general account assets	<ul style="list-style-type: none"> <li>Net investment income on reinvestment assets and defaults on general account invested assets follow assumptions prescribed under VM-20</li> </ul>	Net reinvestment spreads are effectively capped at 50/50 A/AA
<b>02</b> Permit simplified reflection of hedging	<ul style="list-style-type: none"> <li>Permit immediate liquidation of currently-held hedge assets in the CTE (adjusted) run</li> <li>Permit non-reflection of hedge accounting and unrealized hedge gains or losses in all projections</li> </ul>	Allowing hedge liquidation in the CTE (adjusted) run mitigates penalty on long-dated hedges
<b>03</b> Reduce minimum CDHS “error factor”, but require back-testing to support chosen “error factor”	<ul style="list-style-type: none"> <li>Replace AG43’s “effectiveness factor” calculation for weighting CTE (best-efforts) and CTE (adjusted) with the C3 Phase II “error factor” calculation</li> <li>Allow “error factor” to reach 5% if the company can demonstrate, via prescribed back-testing disclosure, that modeled hedge performance in “best-efforts” CTE tracks historical hedge performance accurately</li> </ul>	Allowing a lower “E” better aligns Statutory liability with economic, enabling fair value hedging  Avoids “double-counting” hedge ineffectiveness, as many insurers already reflect hedge ineffectiveness within the best-efforts run itself
<b>04</b> Align conservatism margin for reflecting non-guaranteed revenue sharing income with historical experience	<ul style="list-style-type: none"> <li>Replace the AG 43 margins for reducing a company’s best-estimate projection of non-guaranteed revenue sharing income in the CTE calculation</li> <li>Multiples linearly grade from 100% of best-estimate in year 1 to 80% in years 5+</li> </ul>	Revised framework is more aligned with historical industry revenue sharing experience



# CHANGES TO ASSET AND LIABILITY PROJECTIONS (2/2)

Reduce minimum CDHS “error factor”, but require back-testing to support chosen “error factor”

$$\text{Stochastic Reserves} = \text{CTE70}(\text{best efforts}) + E \times \max[0, \text{CTE70}(\text{adjusted}) - \text{CTE70}(\text{best efforts})]$$



Company to specify a value for *E* (the “error factor”) in the range from 5% to 100%  
**Higher the ability of stochastic model to capture all risks, lower the value of *E***

Formal back-testing is required on at least the most recent 12 months

**Explicit method**  
 (for companies that model hedge CFs directly)

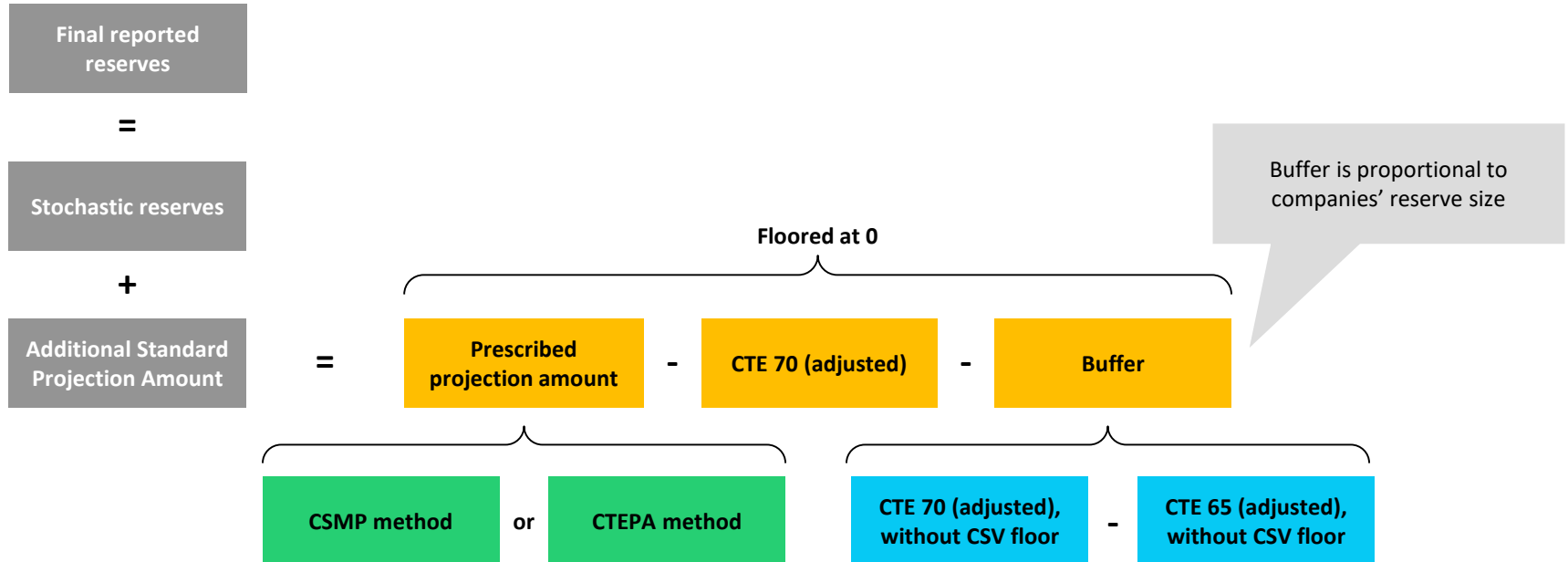
**Implicit method**  
 (companies that hedge implicitly by quantifying the cost/benefit of hedging)

1. Allowed to reflect no hedge positions, in which case hedge positions held at valuation date are replaced with cash and invested using company’s investment strategy

# ALIGN STANDARD SCENARIO CALCULATIONS WITH CTE “ADJUSTED”

Standard scenario was replaced with a new framework which aligns the calculation logic with the CTE adjusted run

## Standard projection framework



- Both the CMSP and CTEPA methods use prescribed assumptions calibrated to industry data
- CMSP method uses deterministic market paths while CTEPA uses the same stochastic scenarios as the CTE 70 adjusted run; companies can elect either method

If assumptions are prudently managed, additional reserves are not required

# PRESCRIBED ASSUMPTIONS – OVERVIEW OF REVISIONS

Prescribed policyholder behavior assumptions have been refreshed to align with industry experience

## Prior framework

- Behavior assumptions differentiate between four classes of products:

Product class	General characteristics of behavior assumptions
<b>Standalone GMDBs</b>	No withdrawals and high lapses
<b>GMABs</b>	No withdrawals and low lapses
<b>GMIBs</b>	No withdrawals, moderate lapses, high annuitization
<b>GMWBs</b>	Immediate – or as early as possible – and largely efficient withdrawals; moderate lapses



## Revised framework

- Differentiate assumptions more finely by product type, and reflect industry experience collected and studied extensively during QIS II

Product class	General characteristics of revisions
<b>Non-rollup GMDBs</b>	Moderate withdrawals and money-ness-sensitive lapses
<b>Rollup GMDBs</b>	Lower withdrawals and lapses than non-rollup GMDBs
<b>GMABs</b>	Moderate withdrawals
<b>Traditional GMIBs</b>	Moderate withdrawals and lower annuitizations
<b>Hybrid GMIBs</b>	Overall behavior aligns closely to comparable GMWBs
<b>GMWBs</b>	Withdrawals reflect incentives; more sensitive lapses

- Distinct assumptions for 403(b) business
- Mortality is 2012 IAM Basic with Scale G2, with scalars varying by attained age and presence of VAGLBs

# RBC C3 CHARGE

Calculate C3 as the difference between statutory reserve and CTE 98 on the same distribution of scenarios; permit smoothing on C3 charge but not on TAR

## Prior framework

$$C3 = \max(\text{CTE } 90_{C3P2}, \text{SSA}_{C3P2}) - \text{Stat. Reserve}$$

- Setting aside voluntary reserve can effectively eliminate C3 charge
- There are numerous differences between the C3 Phase II and AG 43 calculations (tax basis, reflection of hedging, market path in standard scenario)

## Revised framework

### Macro Tax Adjustment (MTA) Method

$$C3 = 25\% \times \left( \underbrace{(\text{CTE } 98_{\text{Pre-tax}} + \text{Add'l Std Proj Amt} - \text{Stat. Reserve}) \times (1 - \text{FIT})}_{(\text{Stat. Reserve} - \text{Tax Reserve}) \times \text{FIT}} - \right)$$

*Capped at amount of non-admitted DTAs attributable to VA portfolio*

- Modeled cash flows ignore the effect of FIT

Or

### Specific Tax Recognition (STR) Method

$$C3 = 25\% \times (\text{CTE } 98_{\text{After-tax}} + \text{Add'l Std Proj Amt} \times (1 - \text{FIT}) - \text{Stat. Reserve})$$

- The effect of FIT is reflected in the projection of Accumulated Deficiencies for each scenario
- Reflect evolution of tax reserves in the projection, taking into account restrictions around the size of tax reserves (e.g. floored at CSV of each contract)

Using a single stochastic distribution reduces non-economic volatility in RBC ratio; use of CTE 98 and  $\frac{1}{4}$  scalar reduces impact of voluntary reserves on the C3 charge

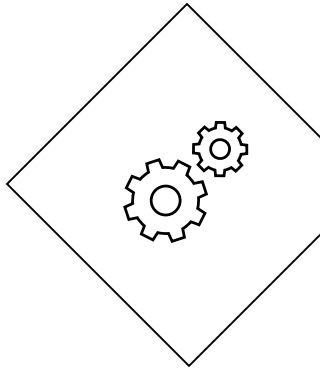
# **SECTION 3**

## **KEY TAKEAWAYS**

# IMPLEMENTATION CONSIDERATIONS

VM-21 required companies to make several significant methodology decisions

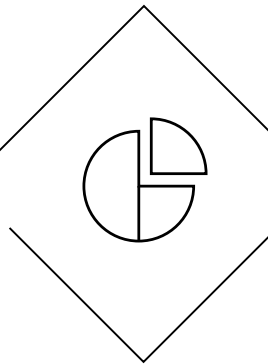
## 01



### Discount rate methodology

Direct iteration method or discount at NAER?

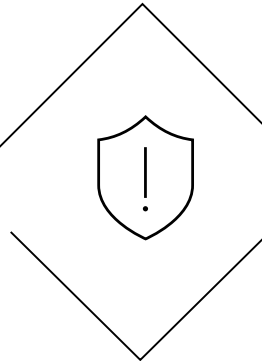
## 02



### Standard projection method

CSMP or CTEPA?

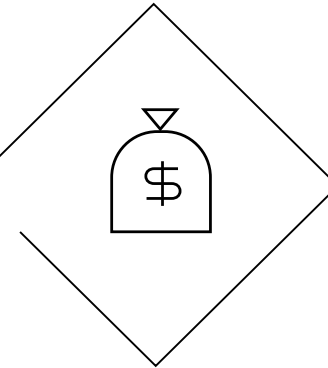
## 03



### Hedging reflection

- Adopt CDHS?
- Implicit or explicit method?
- Which Greeks to hedge?

## 04



### C3 tax methodology

Reflect FIT within or outside the cash flow model?

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Methodology decisions should consider financial impacts and balance sheet stability as well as ease of implementation

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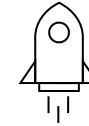
# IMPLICATIONS

Revised VA statutory regime is the result of multiple quantitative impact studies to address misalignments within prior framework

**01**

## **VM-21 benefits**

Changes to Stochastic and Standard Projection calculations remove non-economic volatility, increase comparability across organizations and enables fair value hedging



**02**

## **Update Statutory models and reporting**

Calculation changes mostly leverage AG43 model functionality, but the Standard Projection required significant new coding. Reporting impacts vary by early adoption vs. phase-in approach and state specific requirements (e.g. NY DFS Reg 213)



**03**

## **Hedge strategy alignment**

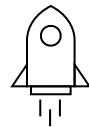
Many companies will review hedge strategy as LDTI and VM-21 reform align GAAP and statutory liabilities more closely with a fair value liability



**04**

## **COVID-19 economic implications**

Companies are likely to see an increase in VM-21 reserves due to lower interest rates and stressed equity markets



# PBR Impacts to Annuities

## Preliminary Framework Elements for Fixed Annuity PBR

Al Zlogar, FSA, MAAA





# Introduction

Over the past year the American Academy of Actuaries Annuity Reserves Work Group (ARWG) made significant progress developing PBR framework elements for non-variable annuities.

The following slides summarize some of the key elements of the framework as of about a month ago. Since then we have worked on additional elements but those are not yet fleshed out enough to include here.

**Caveat** – all of the discussions/recommendations on these slides are still in process, subject to change, and will be discussed with and reviewed by LATF VM-22 subgroup over a series of several meetings.



# Preliminary Framework Elements for Fixed Annuity PBR

American Academy of Actuaries Annuity Reserves Work Group (ARWG)

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# ARWG Objective

Objective: Propose a new statutory reserve methodology for fixed annuities that uses an actuarial framework to determine reserves based on the level and type of risk inherent in the contract.

## ARWG Pillars of Objective<sup>i</sup>

- 1) Appropriate Reflection of Risk – All else equal, greater risk in ***moderately adverse conditions*** requires greater statutory reserves, and vice-versa.
- 2) Comprehensive – The statutory reserve accounts for all ***material risks covered in the Valuation Manual, product features, and potential management actions*** associated with the policies or contracts being valued.
- 3) Consistency Across Products – Statutory reserves between two contracts with ***similar features and risks are consistent*** given the same anticipated experience, regardless of product type.
- 4) Practicality and Appropriateness – ***Balance principles above with an approach that is practical***, auditable, and able to be implemented.



# ARWG Vision and Need

Vision: Provide Academy framework on principle-based reserve (PBR) methodology for fixed annuity products and promote consistency with existing PBR frameworks.

## How ARWG Plans to Accomplish Vision

- a) Propose a PBR Approach—The ARWG plans to propose a CTE70 stochastic reserve calculation.
- b) Develop a Framework Deck—Develop a set of slides laying out various elements of methodology.
- c) Recommend Consistency With VM-21 Where Appropriate—Start with VM-21 methodology.

## Why Fixed Annuity PBR now?

- Flexible Methodology—As new products introduce greater optionality and reinvestment risk, there is greater need for a reserve methodology that appropriately captures the risks in these products, as well as future products that emerge.
- Extend Existing PBR Framework—Seek consistency between fixed annuities and life/variable annuities (VM-20/VM-21).

# Preliminary Timeline

Fall 2019 – Spring 2020

- Develop proposed fixed annuity PBR framework deck
- Begin initial modeling sensitivities for generic FIA w/guarantee

Summer 2020

- ARWG to present framework deck proposal to LATF

Fall 2020

- Seek LATF endorsement of PBR framework deck (w/feedback addressed)
- Valuation Manual language drafting efforts

Spring 2021

- Begin industry field testing using draft (specifics TBD)

Spring 2022

- Target adoption of fixed annuity PBR (potentially VM-22)
- Target 1/1/2023 effective date (monitor as progress develops)



# Preliminary Framework Methodology Elements

American Academy of Actuaries Annuity Reserves Work Group (ARWG)



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# Proposed Elements of Framework

- 1) Scope
- 2) Methodology/Structure
- 3) Starting Assets and Discount Rates
- 4) Reinvestments and Net Spreads
- 5) Hedging
- 6) Economic Scenarios
- 7) Mortality Assumptions
- 8) Policyholder Behavior Assumptions
- 9) Other Liability Assumptions
- 10) Non-Guaranteed Elements
- 11) Joint Payouts & Supplemental Benefits
- 12) Reinsurance
- 13) Aggregation
- 14) Exclusion Test
- 15) Tax Considerations and Allocation
- 16) Capital Considerations
- 17) VM-31 Disclosures
- 18) Experience Reporting
- 19) VM-G Governance



# Proposed Elements of Framework

- The following slides touch on some, but not all of the proposed elements listed on prior slide.
- The ARWG work is ongoing to complete the approach/slides for the remaining items.
- As noted earlier, all of the discussions/recommendations on these slides are still in process, subject to change, and will be discussed with and reviewed by LATF VM-22 subgroup over a series of several meetings.





# 1 – Product Scope

## Products In-Scope<sup>i</sup>

### Account Value Based Annuities

- Deferred Annuities (SPDA & FPDA)
- Multi-Year Guarantee Annuities (MYGA)
- Fixed Indexed Annuities (FIA)
- Market-Value Adjustments (MVA)
- Two-tiered Annuities
- GLBs and Other Guarantees/Riders

### Payout Annuities

- Single Premium Immediate Annuities (SPIA)
- Deferred Income Annuities (DIA)
- Pension Risk Transfer (PRT) Annuities
- Structured Settlement Contracts (SSC)

## Products Out-of-Scope

- Guaranteed Investment Contracts (GICs)
- Funding Agreements
- Mortality-Linked Securities / Longevity Reinsurance

## VM-21 or Fixed Annuity PBR<sup>ii</sup> (TBD)

- Modified Guaranteed Annuities (MGAs)
- Structured Annuities
- Hybrid Variable and Fixed Annuities

## Contract Application (TBD)

- Three years over which implementation is optional
- Application to enforce eventually?

(i) Includes both individual and group annuities

(ii) "VM-21 or Fixed Annuity PBR" means that the proposal is for these contracts to fall in at least one of the two (not clear which one at this point)

# 2 – Methodology/Structure

**Recommendation:** Use stochastic calculation consistent with VM-21, exclusion testing consistent with VM-20, and established set of principles for aggregation; Separate initiative will cover Academy principle-based capital efforts.

## Preliminary Fixed Annuity PBR Methodology

### a) Stochastic Reserve Calculation

- CTE70 of scenario reserves using greatest value of accumulated deficiencies, consistent with VM-20 and VM-21
- Scenario reserve = starting assets plus greatest PV of future deficiencies (GPVAD), floored at aggregate cash surrender value
- ARWG's perspective so far is for a disclosure-only assumption benchmark rather than minimum floor, but being discussed

### b) Exclusion Test

- Permit an optional exclusion test such that, if a group of policies passes, the company may elect to follow pre-PBR requirements
- Pass based on whether the group of policies have immaterial market risk and contract optionality (more details on later slide)

### c) Aggregation

- Determine aggregation for scenario reserve calculations based on set of outlined principles (still under development)

### d) Capital

- Refer to Academy C3 Life & Annuity Work Group, which is exploring Total Asset Requirement (TAR) approach for fixed annuities



# 3 – Starting Assets and Discount Rates

**Recommendation:** Follow VM 21 requirements, but with possible safe harbor for borrowing upon depletion of assets.

## **Preliminary Fixed Annuity PBR Methodology**

### **a) Starting Assets (same as VM-21)**

- Equals approximate value of statutory reserves + pre-tax IMR attributable to assets selected
- Separate account plus hedges and book value of general account assets

### **b) Discount Net Asset Earned Rate (NAER) (same as VM-21)**

- Calculate present value of accumulated deficiencies by discounting at the scenario specific NAER on additional assets
- Additional assets: project invested appropriate additional asset portfolio, outside of starting asset portfolio
- If there are accumulated deficiencies at end of year, then increase assets and repeat
- Determine vector of annual earned rates replicating growth in invested additional asset portfolio to end of projection
- Allow “Direct Iteration Method” to solve for starting assets resulting in “defeasement” of future benefits/expenses

### **c) Borrowing Assumption (same as VM-21, but with potential update)**

- TBD



# 4-6 – Other Asset items/assumptions, scenarios

**Recommendation:** Follow requirements consistent with VM-21 but extend the concept of using company-specific reinvestment, spread, and default assumptions, in addition to no CDHS<sup>i</sup> distinction and an optional indexed-credit modeling method.

## Preliminary Fixed Annuity PBR Methodology

- a) Starting asset yields reflect current market conditions (consistent with VM-20/VM-21)
- b) Spreads and Defaults
  - Reflect company experience defaults and reinvestment spreads up to 4 years, grading to prescribed assumptions by year 7
  - May set to AOMR<sup>ii</sup> assumptions with any prudent estimate adjustments (reserve must not be lower than if using AOMR)<sup>ii</sup>
- c) Reinvestment Rate Mix, Discount Rate, and Starting Assets
  - Reflect company-specific reinvestment mix
  - Follow VM-21, using Net Asset Earned Rate (NAER) and projecting additional assets.
- d) Hedging Requirements
  - Follow VM-21, but no CDHS<sup>i</sup> distinction and allow indexed-hedging programs to use a breakage expense approach in Best Efforts CTE70 (reducing hedge payoffs relative to index credits using an effectiveness multiple), thereby not modeling “Adjusted CTE70”
- e) Economic Scenarios
  - Follow VM-21 requirements (there is a separate NAIC/ Academy initiative on ESGs across life and annuities)

13

(i) CDHS = Clearly Defined Hedging Strategy; If CDHS definition is removed, consider if/how to define a “seasoned hedging program”

(ii) AOMR = Actuarial Opinion Memorandum Requirements



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# 7-11 – Liability Assumptions

***Recommendation:*** Follow requirements consistent with VM-21 but consider requirements around non-guaranteed elements further, additional sensitivity testing around dynamic assumptions, remainder TBD.

## **Preliminary Fixed Annuity PBR Methodology**

- a) **Mortality**
  - Follow VM-21, which is based on company-specific experience and credibility adjustments to establish prudent estimates
- b) **Policyholder Behavior**
  - Follow VM-21, but also require sensitivity testing across various types of economic conditions if using static assumptions or one-sided dynamic assumptions
- c) **Non-Guaranteed Elements (NGEs)**
  - TBD
- d) **Expenses, Other Assumptions, Supplemental Benefits**
  - TBD



# 14 – Exclusion Test

**Recommendation:** Use VM-20 exclusion testing methodology with modifications, consisting of three options: ratio test, demonstration test, and certification. If pass, use pre-PBR CARVM. Do not recommend following VM-21 alternative methodology.

## Preliminary potential Fixed Annuity PBR Methodology

- a) Stochastic Exclusion Ratio Test
  - Calculate scenario reserve across 16 prescribed scenarios; pass if the highest reserve over the baseline reserve is less than x%
  - Calibrate x% at target level for expected products failing, set initially through preliminary modeling (eventually through field testing)
- b) Stochastic Exclusion Demonstration Test
  - Demonstrate that the stochastic reserve is less than AG33 / pre-PBR CARVM
- c) Certification Method (not allowed for contracts with “material guarantees,” to be defined)
  - Subject to regulatory approval, qualified actuary certifies immaterial market risk and asset volatility risk

## Examples of Products that Might Pass or Fail (still in progress – ARWG to develop principles)

### Passing

- Short annuity certain (15-20 years or less)
- Fixed deferred annuities with no guarantees other than low guaranteed interest rate

### Failing

- Long-duration SPIAs, PRT, and payout annuities
- Deferred annuities with material guarantees
- Blocks supported by future hedge purchasing



# Other Open Questions being discussed

- 1) Inforce Application—Make fixed annuity PBR retrospective to inforce policies? This includes policies issued not only back to the NAIC Valuation Manual Operative Date (1/1/2017), but also to pre-2017-issued contracts.
- 2) Review and consider product scope for certain products
- 3) Net Assets and Reinvestment Mix—Use company-specific spreads and defaults for limited period (e.g., 4 years) prior to grading to prescribed spreads defaults (e.g., by year 7)? Use company-specific reinvestment mix?
- 4) Exclusion Test Methodology—Agree with Academy’s preference to use an exclusion test? Use VM-20-based approach?
- 5) Aggregation—Agree with aggregating based on principles? Fixed vs. variable?
- 6) Others still being determined



# Preliminary Modeling Efforts

- To assist the ARWG, Rick Hayes at Willis Towers Watson developed a reserve model for a prototype fixed indexed annuity (FIA) product with and without a guaranteed living benefit (GLB) to calculate initial and projected illustrative fixed annuity PBR reserves and compare to existing approach reserves
- Objectives of this modeling are the following:
  - Calculate PBR reserves for hypothetical new business model office for FIA with and without GLB
  - Project EoY reserves along a sample deterministic outer loop (interest rates following forward curve based on valuation date yield curve; equity growth rates based on a deterministic total return growth assumption)
  - Inner loop calculates PBR reserves and existing framework reserves at time 0 and end of outer loop projection years
  - Compare projected reserves for stochastic PBR reserve at CTE70 with and without margins to current statutory requirements
  - Helps to test and inform ARWG recommendations for framework elements
  - Preliminary testing for percentage threshold on stochastic exclusion ratio test
  - Include sensitivity tests on various items - profitability levels, economic conditions, reinvestment strategies, and liability assumptions

