

# NAIC VA RESERVE AND CAPITAL REFORM RECOMMENDED REVISIONS TO AG43 & C3P2

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# Agenda

- Recap background of the NAIC VA reserve and capital reform initiative
- Outline work conducted in, and conclusions obtained via, the Quantitative Impact Study
- Present detailed recommendations for revising the current VA reserve and capital framework
- Discuss next steps towards the NAIC vote

# Background of the initiative and purpose of this document

- The NAIC enacted C3 Phase II in 2006, followed by AG 43 in 2009
- The interplay of these standards introduced unprecedented complexity into VA statutory balance sheet and risk management, prompting the use of captive reinsurance transactions
- In 2015, the NAIC commissioned an initiative to identify changes to the statutory framework for VAs that can remove or mitigate the motivation for insurers to engage in captive reinsurance
- On September 10, 2015, Oliver Wyman provided the NAIC with a preliminary report covering several sets of ideas for improvements to the current AG 43 and C3 Phase II frameworks, centered around:
  - Mitigating the asset-liability accounting mismatch between hedge instruments and statutory liabilities
  - Removing non-economic volatility in statutory capital charges and resultant solvency ratios
  - Facilitating greater harmonization across insurers and products for greater comparability
- To assess the efficacy of the recommended ideas, the NAIC commissioned a Quantitative Impact Study (“QIS”) with selected VA writers, spanning February to July of 2016
- The QIS provided valuable insights into the current framework, confirmed that our recommendations can be effective tools to bring about desired change, and motivated many of the details of our proposed revisions
- This document outlines our specific recommendations for revising the AG 43 and C3 Phase II frameworks
- Oliver Wyman recommends that rigorous coordinated impact testing be performed during a comment period to inform the proper setting and fine-tuning of framework parameters<sup>1</sup>

1. This document presents the structural elements of the proposed revisions to AG 43 and C3 Phase II. Certain parameters, however, are subject to refinement during the comment period – these parameters are indicated with brackets (“[ ]”) throughout this document.

During the first phase of the NAIC VA captive study, participating insurers highlighted five principal motivations for captive use

Motivation		# of insurers
Mitigate non-economic volatility in statutory capital ratios	<ul style="list-style-type: none"> <li>Avoid unstable division between reserves and RBC created by the use of non-aligned elements of AG43 and C3 Phase 2</li> </ul>	10+
Align market risk profiles of the funding requirements and the insurer target hedge program	<ul style="list-style-type: none"> <li>Adopt a reserve and capital standard with a market-sensitivity aligned with that of their target hedging program</li> <li>Multiple framework elements cited as the misalignment source</li> </ul>	9+
Mitigate funding requirement in downturn scenarios (net of the hedging strategy)	<ul style="list-style-type: none"> <li>Avoid increases in capital requirements that cannot be satisfied by payoffs from the insurer hedge program in a downturn scenario</li> </ul>	4+
Consolidate exposures from across legal entities	<ul style="list-style-type: none"> <li>Realize diversification benefits afforded in the stochastic calculations across business issued in multiple entities</li> <li>Harness economies of scale in risk management operations</li> </ul>	2+
DTA admissibility	<ul style="list-style-type: none"> <li>Avoid significant discrepancies between tax reserves and capital requirements that can result in concurrent large tax obligations and increases in funding requirements</li> </ul>	2+

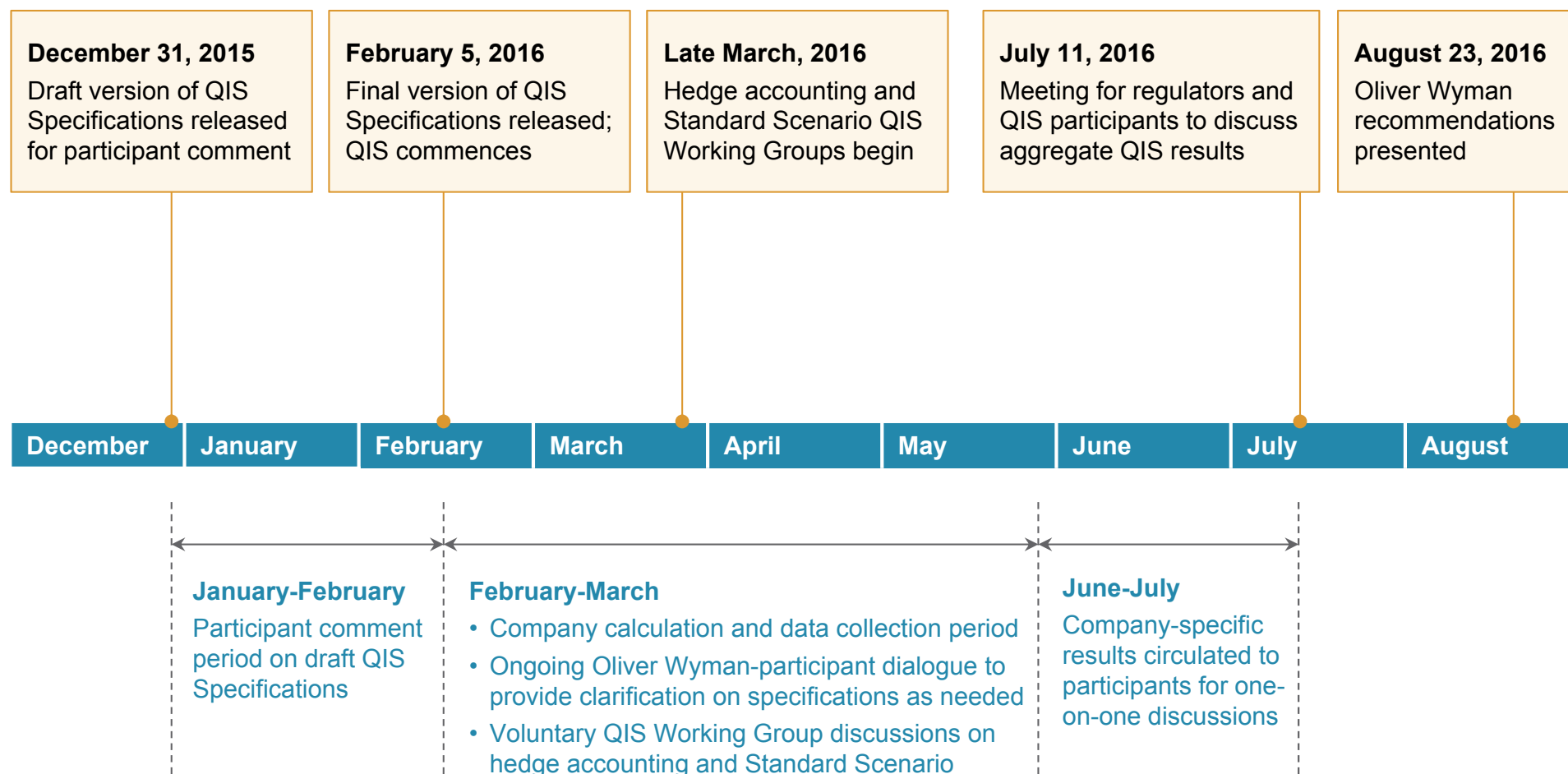
Subsequently, in September 2015, we presented to the NAIC five sets of ideas for framework improvements that are immediately tied to VA captives

Idea	Description
1 <b>Align economically-focused hedge assets with liability valuations</b>	<ul style="list-style-type: none"><li>• Clarify and endorse SSAP 86 applicability</li><li>• Consider equivalent approaches for all VA hedge assets</li><li>• Remove or allow greater flexibility in reflecting run-off of currently-held hedge assets in the stochastic “adjusted” runs</li></ul>
2 <b>Reform Standard Scenarios (AG43 and C3P2)</b>	<ul style="list-style-type: none"><li>• Specify a fuller set of capital markets risk factors informed by market conditions</li><li>• Tailor assumptions to guarantee designs to harmonize level of conservatism</li><li>• Refresh prescribed behavior assumptions to incorporate emerging experience</li><li>• Calculate the Standard Scenario Amount on an aggregate, instead of seriatim, basis</li></ul>
3 <b>Align TAR and reserves</b>	<ul style="list-style-type: none"><li>• Restructure the C3 charge calculation to use fewer and better-aligned calculations</li></ul>
4 <b>Revise asset admissibility for derivatives and DTAs</b>	<ul style="list-style-type: none"><li>• Exempt designated VA hedge assets from derivative limit (or increase limit)</li><li>• Permit DTA partially as admitted asset based on a recoverability test</li></ul>
5 <b>Standardize capital markets assumptions</b>	<ul style="list-style-type: none"><li>• Create market-informed calibration criteria for interest rate, FX, and volatility paths</li><li>• Commission work-stream to propose guidance on reflection of volatility-control funds</li></ul>

# From early February to mid-July, the industry and Oliver Wyman conducted a Quantitative Impact Study (“QIS”) to evaluate potential framework revisions

## Overview of QIS timeline

The QIS included 15 participant companies



# The QIS evaluated whether the initial recommendations can bring about changes aligned with our 2015 framework enhancement objectives

Enhancement objectives	Description
<b>Framework requirements</b>	<b>Ensure robustness of funding requirements</b> <ul style="list-style-type: none"> <li>Reserve and capital requirements should be robust – i.e., adequate to ensure liability defeasance with reasonable confidence – in light of the portfolio risks</li> </ul>
	<b>Promote sound risk management</b> <ul style="list-style-type: none"> <li>Additional risk mitigation, in ordinary circumstances, should: <ul style="list-style-type: none"> <li>Reduce a portfolio's total funding requirements;</li> <li>Minimize surplus and funding requirement pro-cyclicality, net of risk mitigation</li> </ul> </li> </ul>
	<b>Promote comparability across insurers and products</b> <ul style="list-style-type: none"> <li>Standardize assumptions across companies and products – including those subject to other statutory reserve/capital frameworks – where appropriate</li> <li>Ensure comparable level of conservatism in framework provisions</li> </ul>
<b>Design choices</b>	<b>Preserve current statutory construct where feasible</b> <ul style="list-style-type: none"> <li>Retain core constructs and principles of the current framework, where possible <ul style="list-style-type: none"> <li>Adherence to principles-based reserving</li> <li>Book value approach to statutory valuation</li> <li>Time-to-worst cash based balance sheet projection</li> <li>Use of “real world” risk scenarios</li> <li>Standard Scenario construct to govern assumptions</li> </ul> </li> </ul>
	<b>Minimize implementation complexity</b> <ul style="list-style-type: none"> <li>Where possible, reduce the computational complexity of framework calculations to improve interpretability of results and minimize model risk</li> </ul>

# The QIS provided insight into both challenges of the current framework and effectiveness of some of the Oliver Wyman initial recommendations

## Conclusions from the QIS

## Details

**Economic-based hedging can adversely impact statutory financials under current framework via multiple mechanisms**

- QIS confirmed economic-based hedging can adversely impact statutory financials via:
  - Misalignment of market-sensitivity between economic and statutory funding requirements, especially with respect to interest rates
  - Lack of statutory funding requirement sensitivity to all risk factors in favorable market conditions, as reserves and TAR become floored at the Standard Scenario or CSV
  - Greater funding requirements when reflecting economic hedging in stochastic calculations due to misalignment between statutory “real-world” scenarios and conditions in which hedge instruments are priced

**Under current statutory framework, full economic hedging is penalized while partial hedging is more optimal**

- Because of misalignments between the statutory and economic frameworks, partial instead of full economic hedging minimizes net effective funding requirements
- Full economic hedging often both (i) increases reserves and TAR under recent market conditions and (ii) generates more surplus volatility compared to partial hedging

**Our initial recommendations, presented in September 2015 are appropriate – but additional study is warranted**


- Solutions studied in the QIS mitigate the misalignment via both hedge accounting and increased market-sensitivity of the statutory reserve and TAR
- Revision of the C3 calculation framework (i) stabilizes non-economic volatility in required capital and (ii) shows tested forms of hedging reduce capital requirements

**Additional opportunities to harmonize practices in the application of AG43 and C3 Phase II exist**

- QIS highlighted divergent practices across the industry – arising primarily from a lack of specificity in current guidelines – with significant impact on funding levels

As a result, the QIS reaffirmed the initial ideas that we had presented in 2015 and motivated the recommendation of several new proposals

Ideas	Specific proposals
1 Align economically-focused hedge assets with liability valuations	1A • Endorse hedge accounting for derivatives originated as part of a VA hedge program
	1B • Remove the Working Reserve when calculating scenario GPVAD
	1C • Permit simplified reflection of hedging in liability projections
	1D • Allow higher credit for liability projections with modeled CDHS, but require back-testing
2 Reform Standard Scenarios (AG43 and C3 Phase II)	2A • Align AG43 Standard Scenario calculations more closely to the stochastic CTE framework
	2B • Remove the C3 Phase II Standard Scenario
	2C • Specify a fuller set of risk factors informed by prevailing conditions and test multiple paths
	2D • Refresh prescribed policyholder behavior assumptions to align with industry experience
3 Align TAR and reserves	3A • Require Starting Assets used in liability projections to remain close to the final reserve
	3B • Calculate C3 as the difference between reserves and a tail CTE on the same distribution
4 Revise asset admissibility for derivatives and DTAs	4A • Increase admissibility limit for designated VA hedges
	4B • Increase admissibility limit for DTAs associated with VA portfolios
5 Standardize capital markets assumptions	5A • Harmonize interest rate and general account net investment income assumptions
	5B • Evaluate alternative calibration criteria for equities and other market risk factors

 Proposal stemming from 09/2015 presentation  New proposal

# Our recommended revisions considered guidance from regulators and general feedback from the QIS participants

General comments	Regulators	QIS participants
<b>Overall</b>	<ul style="list-style-type: none"> <li>• Ensure funding requirements are robust and reasonable over a range of equity market and interest rate conditions</li> <li>• Ensure more accurate and consistent management of IR risk</li> <li>• Align regulatory standards with incentives for enhanced interest rate risk management</li> <li>• Look for the simplest methodology to satisfy these objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Significant time needed to study and potentially revise current proposals given multitude of changes and limited involvement from non-QIS participants</li> <li>• Decision to recapture will depend on whether revised framework is preferable than captive solution</li> </ul>
<b>On balance sheet market-sensitivity</b>	<ul style="list-style-type: none"> <li>• Support a framework that promotes                             <ul style="list-style-type: none"> <li>– Interest rate-sensitivity of funding requirements; and</li> <li>– A more uniform, positive cost of equity risk</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Align market-sensitivity of assets and liabilities</li> <li>• Prefer to bring hedge assets closer to liability valuation – i.e., hedge accounting – rather than increase liability sensitivity</li> </ul>
<b>On stochastic calculation</b>		<ul style="list-style-type: none"> <li>• Improve consistency of IR scenario generation across industry</li> <li>• Harmonize asset modeling throughout principle-based reserving framework – e.g., VM-20</li> </ul>
<b>On Standard Scenario</b>	<ul style="list-style-type: none"> <li>• Maintain at least one Standard Scenario</li> <li>• Study to see whether testing multiple capital markets paths is necessary to provide meaningful Standard Scenario results</li> <li>• Inform non-market assumptions with emerging experience – provided robust assumption governance is maintained</li> </ul>	<ul style="list-style-type: none"> <li>• Focus Standard Scenario on establishing a minimum reserve</li> <li>• Align calculation framework and market-sensitivity of Standard Scenario with those of stochastic calculations</li> <li>• Set behavior assumptions taking into account credible industry experience collected to-date while ensuring tractable modeling</li> </ul>
<b>On tax considerations</b>	<ul style="list-style-type: none"> <li>• Regulatory considerations are the foremost objective – i.e., funding requirement efficacy should not be materially compromised to accommodate tax reserve considerations</li> </ul>	<ul style="list-style-type: none"> <li>• Impact of framework changes on tax reserve calculations for VAs are uncertain at this time – further discussion is needed between industry, IRS, and Treasury on this topic</li> <li>• Developments from these discussions should be considered in designing the VA reserve construct</li> </ul>

## The remainder of this document discusses our recommended revisions to the AG43 and C3 Phase II frameworks in greater detail

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Proposal 1

Align economically-focused hedge assets with liability valuations

# Summary of recommended framework revisions

## Align economically-focused hedge assets with liability valuations

Proposal	Specific recommended framework revisions
<b>1A Endorse hedge accounting for derivatives originated as part of a VA hedge program</b>	<p><b>For accounting treatment on the statutory balance sheet</b></p> <ul style="list-style-type: none"> <li>• NAIC SAPWG is leading an effort to prescribe hedge accounting treatment for designated derivative instruments hedging interest rate risk in VA portfolios</li> <li>• Endorse the treatment suggested in the NAIC's Issue Paper – <i>Special Accounting Treatment for Limited Derivatives</i>, drafted by NAIC staff with input from Oliver Wyman <ul style="list-style-type: none"> <li>– Allow hedge accounting for derivatives originated as part of a CDHS that can be shown to provide an effective economic hedge against a VA portfolio (which can also be dynamic)</li> <li>– Carry derivatives on a fair value basis, but offset transient mismatches between AG43 changes and hedge gains or losses by establishing deferred assets/liabilities – which are amortized over a prudent estimate of liability duration</li> </ul> </li> </ul> <p><b>For reflection in liability projections</b></p> <ul style="list-style-type: none"> <li>• Exclude the deferred assets and liabilities from Starting Assets, and allow full simulation of hedge accounting or non-reflection, per <b>Proposal 1C</b></li> </ul>
<b>1B Remove Working Reserve</b>	<ul style="list-style-type: none"> <li>• Align with VM-20 in setting the Working Reserve to zero when calculating scenario GPVAD</li> </ul>
<b>1C Permit simplified reflection of hedging in liability projections</b>	<ul style="list-style-type: none"> <li>• Permit immediate liquidation of currently-held hedge assets in the AG 43 “adjusted” run</li> <li>• Permit non-reflection of hedge accounting and unrealized hedge gains or losses in all projections</li> </ul>
<b>1D Allow higher credit for liability projections with modeled CDHS, but require back-testing</b>	<ul style="list-style-type: none"> <li>• Allow the AG43 “E factor” to reach up to 100% if it can be demonstrated that the “best-efforts” run already has sufficient conservatism in reflecting hedge ineffectiveness</li> <li>• Require back-testing disclosure to compare modeled CDHS in the “best-efforts” run vs. historical hedge performance; regulators may use disclosure to adjust the allowed E factor</li> </ul>

## 1A Endorse hedge accounting for derivatives originated as part of a VA hedge program

### Current framework

- The VA statutory balance sheet has an asset-liability accounting mismatch:

Item	Accounting framework used
Derivative instruments	Fair value; impact of short-term interest rate changes is recognized immediately in surplus
Reserves and Total Asset Requirement ("TAR")	AG 43 and C3 Phase II, both "book value" in nature; impact of short-term interest rate changes, if they persist, is recognized over time

### Recommendations

#### For accounting treatment on the statutory balance sheet (purview of SAPWG)

- Endorse treatment suggested in NAIC's Issue Paper *Special Accounting Treatment for Limited Derivatives*, drafted by NAIC staff with input from Oliver Wyman
  - Allow hedge accounting for derivatives originated as part of a CDHS shown to be an effective economic hedge against a VA portfolio (which can be dynamic)
  - Carry derivatives on a fair value basis, but offset transient mismatches between AG43 changes and hedge gains or losses by establishing deferred assets/liabilities
  - Amortize deferred assets/liabilities over a prudent estimate of liability duration

#### For reflection in liability projections (purview of VAIWG)

- Exclude the deferred assets and liabilities from Starting Assets, and allow either full simulation of hedge accounting or non-reflection, per **Proposal 1C**

### Rationale for recommendations

#### Promote sound risk management

- Proposed hedge accounting treatment enables greater amounts of interest rate hedging
  - Reduces accounting mismatch between hedge instruments and VA liabilities
  - Mitigates incremental statutory surplus volatility driven by economic hedging
  - Allows for dynamic hedge programs and hedge targets, in alignment with prevalent hedging practices
- IR focus addresses the most problematic area – reserves and TAR have much lower short-term IR sensitivity than the liability fair value

#### Promote comparability

- Proposal retains fair value visibility on the balance sheet and limits amortization periods of deferred assets / liabilities for greater harmonization

#### Preserve current statutory construct

- Proposal aligns asset accounting treatment to liability valuations while retaining the current statutory liability calculation

## 1B Remove the Working Reserve when calculating scenario GPVAD

### Current framework

#### Appendix A

- Stochastic calculations are based on calculating the assets needed to satisfy the Greatest Present Value of Accumulated Deficiency (“GPVAD”), where:

$$\text{Accumulated Deficiency} = \text{Working Reserve} - \text{Accumulated Assets}$$

- The Working Reserve (“WR”) is set to the cash surrender value (“CSV”) and is meant to reflect:
  - Run-off of the CARVM expense allowance – i.e., surrender charge
  - Separate account assets not available to the insurer for general account claims

### Recommendations

#### Appendix A

- Set the Working Reserve to zero in all time periods of the projection, which aligns with the GPVAD framework used in VM-20 for life insurance products
- The Accumulated Deficiency calculation becomes:

$$\text{Accumulated Deficiency} = 0 - \text{Accumulated Assets}$$

### Rationale for recommendations

#### Promote sound risk management

- While not intended as a proxy for statutory reserve, the WR acts as one in stochastic projections and discourages hedging
  - Early hedge losses – realized or unrealized – are not offset by WR release
  - Large unrealized in-projection hedge losses can thereby trigger deficiencies and drive reserves
- Removing the WR mitigates this issue, as insurers no longer incrementally reserve for an accounting mismatch between hedge assets and the WR

#### Ensure robust funding requirement

- The WR is eventually exhausted via cash outflows; thus, sufficient assets are still needed to meet such outflows without reflecting the WR

#### Promote comparability

- Revision aligns the VA framework more closely to other statutory reserving calculations – e.g.,
  - VM-20 for life insurance products
  - Cash Flow Testing for asset adequacy analysis

#### Minimize implementation complexity

- Revision simplifies scenario GPVAD calculation

## 1C Permit simplified reflection of hedging in liability projections

### Current framework

- Most insurers interpret AG 43 and C3 Phase II to require that derivatives be reflected at fair value in liability projections, absent hedge accounting or permitted practices
- However, some insurers have adopted alternative interpretations:
  - Not reflecting unrealized gains or losses on hedge assets in the AG 43 “adjusted” run, in which currently-held hedges are run off but no rebalancing is permitted
  - Using an “implicit method” to reflect a dynamic hedge program, as described under Q11.2 of the Practice Note, where projected hedged cash flows are reduced in exchange for reflecting the market cost – i.e., option value – of these cash flows

### Recommendations

- Permit companies to liquidate currently-held hedge assets immediately in the AG 43 “adjusted” run – i.e., by replacing hedges included in Starting Assets with cash equal in amount to the hedge assets’ market value on the Valuation Date
- Permit companies carrying hedge instruments on a fair value basis not to reflect unrealized gains or losses on hedge instruments in stochastic projections
- Permit companies with hedge accounting treatment not to reflect the mechanics of hedge accounting such that realized gains or losses are recognized immediately

### Rationale for recommendations

#### Promote sound risk management

- Allowing hedge liquidation in the AG 43 “adjusted” run mitigates the penalty on long-dated hedges
  - Current run-off approach can create persistent open short positions, as companies cannot rebalance to fit evolving liability Greeks
  - If the scenario moves against the open position, significant hedge losses occur
  - In practice, insurers would rebalance to close or reduce these net open positions
- Recognizing only realized hedge gains or losses is consistent with proposal of removing the WR and greater alignment to Cash Flow Testing framework
- Unrealized gains or losses, with the removal of the Working Reserve, have negligible impact on the timing or size of the GPVAD even if reflected

#### Preserve current statutory construct

- Maintains restriction of not adding new protection in the AG 43 “adjusted” run – only currently-held hedge assets may be used

#### Minimize implementation complexity

- Recommended revision simplifies the framework and reduces the high computational burden of continuously calculating derivative fair values

## 1D Allow higher credit for liability projections with modeled CDHS, but require back-testing

### Current framework

- The reported CTE Amount is a weighted average of two separate runs:
  - Best-efforts:** reflects the company's actual hedging practices
  - Adjusted:** no hedge rebalancing (AG 43) or higher ineffectiveness (C3 Phase II)
- The weight allowed to be applied to the best-efforts run depends on the framework – AG 43 vs. C3 Phase II – and the method used to reflect dynamic hedging

Weight ("E factor")	AG43	C3 Phase II
Upper bound for explicit dynamic hedge modeling	70%	95%
Upper bound for implicit dynamic hedge modeling	30%	95%
Requirement if best-efforts run > adjusted run	-	100%

### Recommendations

- Allow the weight to reach up to 100% if it can be demonstrated that the "best-efforts" run already has sufficient conservatism in reflecting hedge ineffectiveness

Weight ("E factor")	AG43	C3 Phase II
Upper bound for explicit dynamic hedge modeling	100%	100%
Upper bound for implicit dynamic hedge modeling	100%	100%
Requirement if best-efforts run > adjusted run	-	-

- Require annual back-testing disclosure comparing historical hedge performance vs. hedge modeling used in best-efforts run, evaluated along the same market path
- Facilitate use of the back-testing disclosure by regulators to adjust allowed weight

### Rationale for recommendations

#### Promote sound risk management

- Avoids "double-counting" hedge ineffectiveness, as many insurers already reflect hedge ineffectiveness within the best-efforts run itself
- Back-testing disclosure facilitates a performance-oriented model risk governance framework and removes arbitrariness of limits on the "E factor"
- The "explicit method" vs. "implicit method" distinction is not meaningful for model governance
  - "Implicit method" is appropriate for a replication- or immunization-based hedge strategy
  - Runtime constraints for "explicit method" often requires many simplifications that deviate from actual hedge execution

#### Preserve current statutory construct

- Maintains concept of using a weighted average of a "best-efforts" run and an "adjusted" run

#### Minimize implementation complexity

- Proposal does not require changes to the actual projections – only the weighting of the two runs

## Proposal 2 | Reform Standard Scenarios (AG43 and C3 Phase II)

## Summary of recommended framework revisions

### Reform Standard Scenarios (AG43 and C3 Phase II)

Proposal	Specific recommended framework revisions
<b>2A</b> Align AG43 Standard Scenario calculations more closely to the stochastic CTE framework	<ul style="list-style-type: none"><li>• Calculate Standard Scenario Amount as the scenario GPVAD using the same Starting Assets as in the stochastic runs and with product cash flows, investment income, and reinsurance incorporated</li><li>• Reflect actual product fees, rider fees, and commission, with revenue sharing projected in the same manner as in the stochastic calculation; subject maintenance expenses to a prescribed minimum</li><li>• Allow reflection of CDHS over the first year, but require hedges to be liquidated at end of the year</li><li>• Aggregate Standard Scenario amounts across policies – subject to a seriatim cap on aggregation benefit provided by the policy’s accumulated product cash flows</li></ul>
<b>2B</b> Remove the C3 Phase II Standard Scenario	<ul style="list-style-type: none"><li>• Remove C3 Phase II Standard Scenario used to calculate Total Asset Requirements; the revised AG43 Standard Scenario continues to act as a floor for reserves – and TAR, by extension</li></ul>
<b>2C</b> Specify a fuller set of risk factors informed by prevailing conditions and test multiple paths	<ul style="list-style-type: none"><li>• Prescribe three “drop and recovery” scenarios with different initial equity and interest rate shocks</li><li>• After first projection year, assume interest rates and all asset classes follow the post-shock forward rates across all three Standard Scenario paths</li></ul>
<b>2D</b> Refresh prescribed policyholder behavior assumptions to align with industry experience	<ul style="list-style-type: none"><li>• Differentiate prescribed behavior assumptions more finely by product and guarantee type</li><li>• Reflect recent industry experience in setting the new Standard Scenario behavior assumptions</li><li>• Refresh Standard Scenario behavior assumptions, if deemed necessary by regulators, by commissioning an independent study of industry data every three years</li></ul>

## 2A Align AG43 Standard Scenario calculations more closely to the stochastic CTE framework

### Current framework

Appendix B

- The Standard Scenario Amount is calculated as the sum of several components:
  - Basic Adjusted Reserve, calculated per AG 33
  - Accumulated net revenue, discounted either at locked-in valuation rates (AG 43) or the 10-year CMT rate plus 50 bps, subject to a 3.0% floor (C3 Phase II)
  - Separate credit for approved hedges and reinsurance
- Allows for limited revenue recognition, with thin account value margins regardless of actual fees collected and non-guaranteed revenue sharing not projected
- Currently-held hedge assets are run off for the first year without rebalancing and liquidated at the end of the projection year

### Recommendations

Appendix B

- Align the calculation framework more closely with the stochastic CTE framework

<b>Scenario Amount</b>	<ul style="list-style-type: none"> <li>• Calculated as Starting Assets + GPVAD, with both terms defined in the same manner as in the stochastic run</li> </ul>
<b>Reflection of revenue</b>	<ul style="list-style-type: none"> <li>• Actual product fees, rider fees, and commission schedules, with the same revenue sharing guidance as in the stochastic run</li> <li>• Prescribed minimum maintenance expense assumptions</li> </ul>
<b>Hedging and reinsurance</b>	<ul style="list-style-type: none"> <li>• CDHS allowed to be modeled for the first projection year, but all hedges are liquidated at the end of the first year</li> <li>• Reinsurance modeled identically as in the stochastic runs</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• Allow aggregation benefits, but subject to a per-policy cap on the PV of accumulated product cash flows</li> </ul>

### Rationale for recommendations

#### Ensure robustness of funding requirements; Promote sound risk management

- Current AG 43 Standard Scenario does not adequately capture portfolio ALM risk
  - Locked-in valuation rate in AG 43 assumes an unrealistic, perfectly ALM-matched portfolio since contract issue for each contract
  - 10-year CMT-based discount rate in C3 Phase II assumes assets backing the portfolio are available for immediate reinvestment
- Use of stochastic calculation construct better measures portfolio funding needs
  - Reflects general account asset ALM positions
  - Leverages more realistic product cash flows with appropriate governance around margins

#### Minimize implementation complexity

- Use of stochastic calculation construct simplifies the framework
  - More intuitive relationships with CTE amount
  - Simpler interpretation and easier identification of the reason for Standard Scenario dominance

#### Maintain current statutory construct

- Retains a Standard Scenario calculation with prescribed assumptions

## 2B Remove the C3 Phase II Standard Scenario

### Current framework

- C3 Phase II Standard Scenario acts as a floor on the stochastic CTE 90 used to calculate TAR and RBC C3 charge
- C3 Phase II Standard Scenario is structurally similar to the AG 43 Standard Scenario, but with several notable differences

Framework attribute	C3 Phase II	AG 43
<b>Tax basis</b>	After-tax	Pre-tax
<b>Market path</b>	More adverse, with 20% initial equity shock	Less adverse, with 13.5% initial equity shock
<b>Discount rates</b>	10-year CMT + 50 bps, floored at 3.0%	At-issue valuation rates
<b>Behavior assumptions</b>	Some differences in prescribed lapse rates	

### Recommendations

- Remove C3 Phase II Standard Scenario from the calculation of the Total Asset Requirement – and thus the RBC C3 charge
- Retain the revised AG43 Standard Scenario such that it continues to act as a floor for reserves – and for the Total Asset Requirement, by extension

### Rationale for recommendations

#### Minimize implementation complexity

- Two main purposes of the C3 Phase II Standard Scenario can be met by the proposed revised AG 43 Standard Scenario
  - Governance of expense and policyholder behavior assumptions
  - Illustration and safeguard of asset adequacy along intuitive, deterministic market paths
- Removing the C3 Phase II Standard Scenario simplifies the framework without sacrificing efficacy

## 2C Specify a fuller set of market risk factors informed by prevailing conditions and test multiple paths

### Current framework

Appendix C

Equity returns	-13.5% initial shock, with up to 5.5% recovery each year
Bond returns	No initial shock; up to 4.85% annual return in later years
Interest rates	Not specified
Discount rates	Locked-in at-issue valuation rates, as specified by SVL
Fixed fund rate	Up to 4.0% per year
Implied volatility	Not specified
FX rates	Not specified

### Recommendations

Appendix C

- Prescribe three different “drop and recovery” market paths differing in initial stress but identical thereafter; the Standard Scenario Amount is the largest from the three

Equity returns	<b>Initial shocks:</b>
Bond returns	<ul style="list-style-type: none"> <li>Path 1: [-13.5%] equity shock, occurring over a full year</li> <li>Path 2: downward IR shock, occurring over a full year</li> <li>Path 3: joint equity and IR shock, occurring a full year</li> </ul>
Interest rates	Bond shock = [20%] of equity shock – [6] × IR shock
Discount rates	<b>After year 1:</b> follow implied forward curve after IR shock
Fixed fund rate	Max(Guaranteed rate, general account earned rate – [200] bps), or follow actual documented crediting practices
Implied volatility	Follows forward volatilities on Valuation Date
FX rates	Follows forward curve on Valuation Date

### Rationale for recommendations

#### Ensure robustness of funding requirements; Promote sound risk management

- Certain risk factors not specified in the current Standard Scenario are needed for fund return, liability, and hedge portfolio projections – e.g.,
  - Interest rates: IR-linked product features, bond fund returns, and hedge asset valuations
  - Implied volatility: volatility-control fund returns and hedge asset valuations
  - FX rates: reinsured, non-USD business
- Use of implied forward rates assumes no asset outperformance given that no hedge costs are projected after the first year

#### Promote comparability

- Using multiple market paths ensures capture of
  - Varied portfolio risk profiles – e.g., products with IR risk-mitigation features
  - Vulnerabilities of insurer ALM practices and hedge programs

#### Minimize implementation complexity

- Use of implied forward rates after the first year for all asset classes simplifies calculations

## 2D Refresh prescribed policyholder behavior assumptions to align with industry experience

### Current framework

Appendix D

- 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, high annuitization, moderate lapses
<b>GMWBs</b>	Immediate – or as early as possible – and largely efficient withdrawals; moderate lapses

### Recommendations

Appendix D

- Differentiate assumptions more finely by product type, and reflect industry experience

Product class	General characteristics of revisions
<b>Non-rollup GMDBs</b>	Moderate withdrawals and moneyiness-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

- Refresh Standard Scenario behavior assumptions by commissioning an independent study of industry experience data every three years
- Enhance regulator-facing disclosure requirements for companies' own assumptions

### Rationale for recommendations

#### Ensure robustness of funding requirements; Promote sound risk management

- Current assumptions are unrealistic and do not reflect industry experience since framework creation
- Triennial industry experience studies would offer a mechanism to update assumptions for latest data – including data in regions where little to no data exist today (e.g., GMWBs in high IR environments)

#### Promote comparability

- Behavioral assumptions within current Standard Scenario calculations have insufficient granularity in product type differentiation
  - Products with different behavioral risk profiles are grouped together and subjected to the same set of behavioral assumptions
  - Prescribed assumptions are conservative for some products within each group but may be non-conservative for others
  - Finer breakdown of product types would ensure a more uniform level of conservatism
- Enhanced disclosure requirements would facilitate regulator understanding of range of practices across industry for similar products

## Proposal 3 | Align TAR and reserves

# Summary of recommended framework revisions

## Align TAR and reserves

Proposal	Specific recommended framework revisions
<b>3A</b> <b>Require Starting Assets used in liability projections to remain close to the final reserve</b>	<ul style="list-style-type: none"> <li>Require that, similar to VM-20, Starting Assets remain within [98-102%] of stochastic reserve in excess of the CSV – which may require iteration of Starting Assets to meet convergence corridor                             <ul style="list-style-type: none"> <li>Stochastic reserve = CTE 70 of Scenario Reserves, subject to voluntary reserves</li> <li>Scenario Reserves = Starting Assets + Scenario GPVAD</li> </ul> </li> <li>Scenario Reserves are subject to a floor equal to the cash surrender value on the Valuation Date</li> <li>Allow companies to choose to use Starting Assets in excess of CTE 70 – e.g., if the company decides to hold voluntary reserves – as long as the convergence corridor is satisfied</li> <li>Allow companies to use approximations – e.g., via discount rates – in calculations insofar as such approximations are disclosed and can be demonstrated regularly not to materially skew results</li> </ul>
<b>3B</b> <b>Calculate C3 as the difference between reserves and a tail CTE on the same distribution</b>	<ul style="list-style-type: none"> <li>Allow the C3 charge to be calculated as:                             <math display="block">C3 = \left\lceil \frac{1}{4} \right\rceil \times ((CTE[98] - \text{Stat. Reserves}) \times 65\% - (\text{Stat. Reserves} - \text{Tax Reserves}) \times 35\%)</math> <p>Where the CTE [98] is calculated on the same distribution of Scenario Reserves as that used to calculate the minimum statutory reserves, and Stat. Reserves may include voluntary reserves</p> </li> <li>Allow companies to, with regulatory approval and with disclosure of the C3 amount as calculated above, project taxes explicitly in the projection of CTE [98] and set C3 as:                             <math display="block">C3 = \left\lceil \frac{1}{4} \right\rceil \times (CTE_{\text{After-tax}}[98] - \text{Stat. Reserves})</math> </li> </ul>

## 3A Require Starting Assets used in liability projections to remain close to the final reserve

### Current framework

- Current AG 43 guidance is relatively ambiguous with respect to the amount of Starting Assets that should be included in the liability projection
- As a result, we have observed two different practices in industry:

Approach	Implied assets backing reserves
Set Starting Assets as the CSV or the prior quarter's reserves, then add the CTE 70 of GPVADs	First iteration of Starting Assets, plus cash available for immediate reinvestment
Iteratively solve for Starting Assets such that the CTE 70 of GPVADs is zero	Assets modeled in the final iteration of Starting Assets

### Recommendations

- Require Starting Asset Amount to remain within [98-102%] of stochastic reserve in excess of CSV, which may require iteration of Starting Assets to satisfy convergence
  - Stochastic reserve = CTE 70 of Scenario Reserves, subject to voluntary reserves
  - Scenario Reserve = Starting Assets + GPVAD, which can be positive or negative, subject to a floor equal to the starting CSV
- Allow companies to approximate – e.g., via discount rates – the Scenario Reserve insofar as such approximations can be demonstrated regularly via disclosure not to skew results materially
- Allow companies to use Starting Assets in excess of CTE 70
  - However, the [98-102%] convergence corridor still needs to be satisfied
  - As such, Starting Assets held in excess of CTE 70 need to correspond to voluntary reserves in equal amount

### Rationale for recommendations

#### Ensures robustness of funding requirements; Promote sound risk management

- Promotes more accurate reflection of ALM and yield characteristics of assets held to back the VA portfolio – particularly important for older portfolios with large general account reserves
- Using CSV as the Starting Assets implies that additional assets needed to back reserves should:
  - Be available for immediate reinvestment; or
  - Have market value equal to the GPVAD
- However, actual additional reserve-backing assets may not have such characteristics, or may have market values different from statement values

#### Promote comparability

- Aligns practices across the industry to promote comparability across insurers
- Aligns the framework with the VM-20 Stochastic Reserve calculation methodology

## 3B Calculate C3 as the difference between reserves and a tail CTE on the same distribution

### Current framework

- The RBC C3 charge is calculated using numerous different calculations:

$$\text{C3} = \text{Max} \left[ \begin{array}{c} \text{After-tax distribution} \\ \text{C3P2 CTE 90} \end{array}, \begin{array}{c} \text{Pre-tax distribution} \\ \text{C3P2 SSA} \end{array} \right] - \text{AG43 Reserve}$$

- There are numerous differences between the C3 Phase II and AG 43 calculations
  - Tax basis – AG 43 is pre-tax, while C3 Phase II is after-tax
  - Reflection of hedging and “E factors” in stochastic calculations
  - Market paths and behavior assumptions in the Standard Scenarios

### Recommendations

#### Appendix E

- Allow the RBC C3 charge to be calculated using a single distribution of Scenario Reserves via the following expression:

$$\text{C3} = \left[ \frac{1}{4} \left[ \left[ \text{Pre-tax CTE[98]} - \text{Stat. Reserve} \right] \times 65\% - \left[ \text{Stat. Reserve} - \text{Tax Reserve} \right] \times 35\% \right] \right]$$

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

- Allow companies to, with regulatory approval, project taxes explicitly in the projection of CTE [98] and calculate C3 using the following expression:

$$\text{C3} = \left[ \frac{1}{4} \left[ \text{After-tax CTE [98]} - \text{Statutory Reserve} \right] \right]$$

- Require all companies to disclose C3 calculated via the first approach

### Rationale for recommendations

#### Ensure robust funding requirements

- Using a single stochastic distribution reduces non-economic volatility in the RBC ratio
- Use of CTE [98] reduces impact of voluntary reserves on the C3 charge
  - C3 is non-zero unless a company elects to hold reserves up to a tax-effected CTE [98]
  - Allows voluntary reserves to reflect better ALM characteristics and benefits from assets originated in a higher yield environment
- Overall approach balances conservative capital requirements with recognition of potential misalignment between statutory and tax bases
  - [1x] RBC ratio credits  $\frac{1}{4}$  of non-admitted DTA
  - [4x] RBC ratio credits full non-admitted DTA

#### Promote sound risk management

- Higher CTE promotes hedging – as hedging is more beneficial in more adverse conditions

#### Minimize implementation complexity

- Calculation in first approach is straightforward, with no need to conduct multiple different projections
- Choice of two approaches allows companies to model taxes more directly for capital management purposes, while providing a minimum safeguard

Proposal 4 | Revise asset admissibility for  
derivatives and DTAs

## Summary of recommended framework revisions

### Revise asset admissibility for derivatives and DTAs

Proposal	Specific recommended framework revisions
<b>4A</b> Increase admissibility limit for designated VA hedges	<ul style="list-style-type: none"><li>Sanction higher admissibility threshold for designated VA hedge assets, such as derivatives originated as part of a CDHS</li></ul>
<b>4B</b> Increase admissibility limit for DTAs associated with VA portfolios	<ul style="list-style-type: none"><li>Raise the current admissibility threshold for DTAs – currently at 15% of surplus – related to VA portfolios</li></ul>

## 4A Increase admissibility limit for designated VA hedges

### Current framework

- Some states limit derivatives as part of their definition of admitted assets – e.g., by capping the aggregate statement value that can be admitted

### Recommendations

- Sanction a higher admissibility threshold for designated VA hedge assets originated as part of a Clearly Defined Hedge Strategy (“CDHS”)

### Rationale for recommendations

#### Promote sound risk management

- Derivative instruments are an integral part of VA hedging and risk management
- Asset admissibility limitations on derivatives become critical during stressed market conditions
  - Derivative hedges increase in value, offsetting the increase in liability funding requirements
  - Given the high market-sensitivity of VA portfolios, insurers rely on hedge programs for surplus protection in severe market stress
  - However, caps on admissibility prevent insurers from seeing the surplus benefit from hedging

#### Minimize implementation complexity

- States have previously granted exemptions from their limitations, providing a precedent

## 4B Increase admissibility limit for DTAs associated with VA portfolios

### Current framework

- SSAP No. 101 currently limits the amount of DTAs admissible to 15% of surplus

### Recommendations

- Raise the current admissibility threshold for DTAs related to VA portfolios

### Rationale for recommendations

#### Promote sound risk management; Promote comparability

- Tax reserves for VAs are currently determined by:
  - *For business issued prior to 2010:* a mixture of Actuarial Guidelines
  - *For business issued in 2010 and after:* the AG 43 Standard Scenario
- Misalignment between statutory and tax reserves means that insurers often need to fund a portion of reserve increases with after-tax dollars
- In particular, insurers may be penalized for using conservative assumptions that increase their CTE Amount relative to the tax reserve
  - The insurer would need to fund the difference with after-tax dollars and establish a DTA
  - However, DTA in excess of the 15% threshold would be non-admitted
- Unless tax reserves can be retroactively changed, statutory framework revisions would not alleviate the DTA issue for in-force portfolios

## Proposal 5 | Standardize capital markets assumptions

## Summary of recommended framework revisions

### Standardize capital markets assumptions

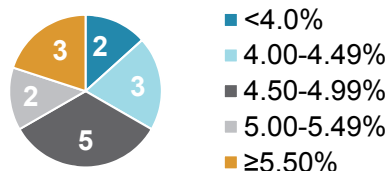
Proposal	Specific recommended framework revisions
<b>5A Harmonize interest rate and general account net investment income assumptions</b>	<ul style="list-style-type: none"><li>• Designate the VM-20 interest rate generator as the prescribed interest rate generator, using the NAIC's MRP formula to set the long-term mean interest rate</li><li>• Modify VM-20 interest rate generator to (i) allow negative interest rates and (ii) increase interest rate volatility – relative to that used in the current generator – when interest rate levels are low</li><li>• For net investment income projections on general account invested assets, follow asset assumptions – e.g., spreads and default costs – prescribed in VM-20</li><li>• Similar to current AG 43 guidance, discount accumulated deficiencies at reinvestment rates to calculate the scenario GPVAD</li></ul>
<b>5B Evaluate alternative calibration criteria for equities and other market risk factors</b>	<ul style="list-style-type: none"><li>• Investigate the effect of updating the equity calibration criteria annually based on the change in the long-term interest rate – a framework revision we support but which requires additional analysis given its potential impact on (i) funding requirements and (ii) hedging incentives</li><li>• Commission a work-stream to develop calibration criteria or quantitative guidance – including correlation with equity returns – for credit and implied volatility processes</li><li>• For asset classes without explicit calibration criteria, require disclosure of the company's scenario generation methods and the resultant Sharpe ratios, with a comparison of the latter against those for asset classes subject to calibration criteria</li></ul>

## 5A Harmonize interest rate and general account net investment income assumptions

### Current framework

- Statutory framework does not provide guidance on interest rate generation
- As a result, a wide range of practices exist in industry today – e.g.,

Long-term mean interest rate assumption used by the 15 QIS participants



- For net investment income from general account invested assets, the guidelines allow reflection of companies' own spread and default cost assumptions

### Recommendations

Appendix F

- Designate the VM-20 interest rate generator as the prescribed generator, with modifications to allow:
  - Negative interest rates, with a floor of [-50] bps
  - Greater interest rate volatility, relative to current generator, when IR levels are low
- Allow proprietary generators only if a company can demonstrate, on an [annual] basis, that it has equal or greater conservatism (lower levels and more dispersion)
- Set the long-term mean interest rate using the NAIC's MRP formula used in VM-20
- For net investment income projections on Starting Assets and reinvested general account fixed income assets, follow the same general account asset modeling – i.e., spread and default cost – assumptions as those prescribed in VM-20
- Follow current AG 43 guidance in discounting scenario cash flows and accumulated deficiencies at the reinvestment rate when calculating the Scenario Reserve

### Rationale for recommendations

#### Ensure robustness of funding requirements; Promote sound risk management

- Promotes prudent interest rate risk management, as scenarios driving funding requirements are more informed by prevailing conditions and reflect a broader distribution of potential interest rates
- Proposed revisions to the VM-20 IR generator improve interest rate risk measurement
  - Interest rate volatility within current generator is proportional to interest rate level
  - The generator may thus understate IR volatility when interest rates are low – e.g., today
  - The generator's 1 bp floor is not reflective of potential negative rates, observed in other global economies and noted as possibility by the FRB

#### Promote comparability

- Promotes greater consistency and comparability in the stochastic run results across companies
- Greater alignment with VM-20 facilitates a more unified statutory framework across different product types – i.e., VAs and life insurance

#### Minimize implementation complexity

- The VM-20 generator is already used by numerous VA writers – albeit with different parameters

## 5B Evaluate alternative calibration criteria for equities and other market risk factors

### Current framework

- The left tail – i.e., adverse equity scenarios – of cumulative returns from US diversified equities may not exceed the following calibration criteria:

Percentile	1 year	5 years	10 years	20 years
2.5%	-22%	-28%	-21%	
5.0%	-16%	-19%	-6%	+51%
10.0%	-10%	-6%	+16%	+110%

- Other asset classes are left to actuarial judgment, with the following guidance:

“... it would generally be inappropriate to assume that a market or fund consistently “outperforms” (lower risk, higher expected return relative to the efficient frontier) over the long term.”

### Recommendations

Appendix G

- Investigate effect of updating the equity calibration criteria annually based on the change in long-term interest rate – e.g., shift the equity return distribution by the same amount that the long-term interest rate changes
  - Framework revision requires additional analyses given its fundamental nature and potential impact on funding levels**
- Commission work-stream to develop calibration criteria or quantitative guidance – including correlation with equity returns – for credit and implied volatility processes
  - Anticipate that development may require several weeks of academic research, with a longer industry review and testing period**
- For asset classes without explicit calibration criteria, require disclosure of the company’s scenario generation methods and the resultant Sharpe ratios, with a comparison of the latter against those for asset classes subject to calibration criteria

### Rationale for recommendations

#### Ensure robustness of funding requirements; Promote sound risk management

- Interest rate decline in recent years have created a lower “cost” to back guarantees with equities
- At 5<sup>th</sup> percentile level under the current calibration criteria, equities underperform a riskless asset by:
  - With 2006 interest rates: ~40% over 10 years
  - With 2016 interest rates: ~20% over 10 years
- Linking equity calibration to long-term interest rates adapts to changing market regimes and maintains a more constant “charge” for risky assets
- However, this is a fundamental framework change with potentially large implications; hence, additional study and impact assessments are needed*

#### Ensure robustness of funding requirements; Promote comparability

- Credit and implied volatility impact reserves and capital via projected bond fund returns and hedge gains in an options-based dynamic program
- However, little work has been done on the calibration criteria for these processes to-date; additional time for study and development would facilitate development of realistic scenarios*

## 6 | Next steps

## Industry feedback on the proposed revisions have emphasized the need for adequate time for review, testing, and commentary

- The QIS was structured to emphasize a wide coverage of potential framework revisions and ensure the tractability of conducting a standardized set of computations by companies with diverse capabilities
- As such, while the QIS allowed us to converge on a set of proposals, it necessarily had several limitations:
  - QIS participants covered only a portion of the VA industry
  - To meet the QIS timeline, many participants conducted testing using representative portfolios; where necessary, some made modeling simplifications while others opted out of specific tests
  - Full set of recommendations was not tested simultaneously, as results of and discoveries during the QIS motivated both revisions to the prior proposals and new proposals
  - Downstream impact from the recommendations – including potential changes to risk management and pricing strategies – were not tested given recommendations were still in development
  - 2015YE conditions were used, which did not reflect the further decline in interest rate levels
- To address these limitations, Oliver Wyman recommends that rigorous coordinated impact testing be performed during a comment period – which will serve several purposes:
  - Allow companies to test the proposed framework in greater depth to understand the precise impact on its funding, hedging, and other business practices
  - Evaluate the impact and efficacy of recommendations that were tested under a different set of parameters during the QIS and provide an opportunity to identify any necessary refinements to these parameters
  - Provide an opportunity for the remainder of the VA industry that did not participate in the QIS to digest the recommendations, conduct internal financial analysis and provide their feedback

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