

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

DECEMBER 1, 2017

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Background of the initiative and purpose of this document

- In 2015, the NAIC commissioned an effort to identify changes to the statutory framework for VAs that can remove or mitigate the motivation for insurers to engage in captive reinsurance transactions for VAs
- After an initial Oliver Wyman report in 2015 identified motivations for captive usage, the NAIC commissioned a Quantitative Impact Study (“QIS”) to develop recommended revisions to the existing framework
- In August 2016, Oliver Wyman presented to the NAIC and the VAIWG a set of recommended structural revisions to the existing framework, 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
- With recommendations from Oliver Wyman and industry, the NAIC resolved to undertake a second QIS (“QIS II”) in 2017 in order to evaluate and parameterize the recommended structural revisions further
- QIS II spanned from February to October and comprised two primary work-streams:
 - Evaluation and parameterization of the revised framework, excluding Standard Scenario assumptions
 - Industry-aggregate experience study aimed to refine prescribed Standard Scenario actuarial assumptions
- Findings from QIS II re-affirmed most of Oliver Wyman’s CTE-related recommendations, but also led to:
 - Significant refinements in the proposed Standard Scenario construct
 - Fine-tuning of several parameters in the revised framework
- This document outlines our specific recommended revisions to the AG 43 and C3 Phase II frameworks and why we believe the NAIC should adopt them

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	10+
Align market risk profiles of the funding requirements and the insurer target hedge program	9+
Mitigate funding requirement in downturn scenarios (net of the hedging strategy)	4+
Consolidate exposures from across legal entities	2+
DTA admissibility	2+

QIS I highlighted several framework shortcomings cited by industry

Properties of the current framework

Details of observation

1 Extensive hedging often increases total statutory funding requirements

- Reflecting hedging in statutory projections can increase reserves and TAR, as stochastic scenarios often assume more favorable returns than those priced into hedge instruments, even at tail confidence levels

2 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 hedging often both (i) increases reserves and TAR under recent market conditions and (ii) generates more surplus volatility compared to partial hedging

3 Substantial surplus erosion occurs from hedge losses in upside scenarios

- In favorable conditions, statutory reserves are not permitted to become negative
- Additional hedge losses – realized or unrealized – when statutory reserves reach zero reduce surplus on a dollar-by-dollar basis, absent hedge accounting

4 Market risk capital – i.e., C3 – disconnected from actual amount of market risk retained

- C3 charge is calculated as difference between TAR and reserves, the calculations of which have significant structural misalignments
- As a result, numerous companies have zero or near-zero C3 charges, and hedging can either increase or decrease C3, depending on the scenario

5 Accordingly, companies' effective funding requirements – i.e., assets needed for a target capital ratio – are difficult to manage

- Volatility in both total surplus and C3 charge create significant volatility in ultimate RBC ratio to which companies aim to manage
- Multiplier effect of target RBC ratios used in industry – i.e., 300-400% – amplifies volatility in companies' effective funding requirement, which often aim to achieve certain target RBC ratios under various stresses

In developing recommendations, we targeted five enhancement objectives – three “target properties” and two “design choices”

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

Regulatory guidance provided by the VAIWG members during both QIS I and QIS II informed our recommendations

	VAIWG guidance provided in QIS I	VAIWG guidance provided in QIS II
Overall	<ul style="list-style-type: none"> • Ensure funding requirements are robust and reasonable over a range of equity market and interest rate conditions • Ensure more accurate and consistent management of IR risk • Look for the simplest methodology to satisfy these objectives 	<ul style="list-style-type: none"> • No additional guidance
Balance sheet market-sensitivity	<ul style="list-style-type: none"> • Align regulatory standards with incentives for enhanced interest rate risk management • Support a framework that promotes <ul style="list-style-type: none"> – Interest rate-sensitivity of funding requirements; and – A more uniform, positive cost of equity risk 	<ul style="list-style-type: none"> • Market-sensitivity in funding requirement should be driven by equity performance and interest rate levels, but not equity or interest rate volatility given long-term nature of liabilities
Stochastic calculation		<ul style="list-style-type: none"> • Insufficient historical evidence to justify linking equity scenarios to prevailing interest rates • However, interest in examining equity scenarios with greater volatility and that are calibrated using longer US history, including data before and during the Great Depression
Standard Scenario	<ul style="list-style-type: none"> • Maintain at least one Standard Scenario • Study to see whether testing multiple capital markets paths is necessary to provide meaningful Standard Scenario results • Inform non-market assumptions with emerging experience – provided robust assumption governance is maintained 	<ul style="list-style-type: none"> • Purpose is to govern company-defined modeling choices and assumptions, not to add stringency to market scenarios • Prescribed assumptions should be calibrated to Prudent Estimate tolerance, defined as average industry experience with a prudence margin • For assumptions with little or no data, set assumptions such that at least 70% of policies exercise at max funding cost
Other considerations – e.g., tax	<ul style="list-style-type: none"> • Regulatory considerations are the foremost objective – i.e., funding requirement efficacy should not be materially compromised to accommodate tax reserve considerations 	<ul style="list-style-type: none"> • No additional guidance

Summary of recommendations

1 of 2

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Framework	Recommendation
CTE Amount	1 Use VM-20 scenario generator for interest rate scenarios
	2 Use VM-20 scenario generator for separate account returns, but recalibrated based on data from 1926 to 2016
	3 Allow companies to use proprietary scenario generators if – and only if – they do not reduce Total Asset Requirement
	4 Introduce principles to govern implied volatility scenario generation, with a “safe harbor” approach provided
	5 Remove the Working Reserve when calculating scenario GPVAD
	6 Discount deficiencies at the Net Asset Earned Rate on Additional Assets
	7 Follow VM-20 guidance on general account asset projections, with additional constraint on borrowing cost
	8 Permit immediate liquidation of currently-held hedges and non-reflection of mark-to-market hedge gains and losses
	9 Reduce minimum allowable CDHS “error factor”, but require back-testing disclosure to support chosen “error factor”
	10 Differentiate treatment of non-guaranteed revenue sharing income by affiliated funds vs. non-affiliated funds
Standard Scenario Amount	11 Align AG43 Standard Scenario calculations with CTE (“adjusted”)
	12 Remove the C3 Phase II Standard Scenario
	13 Project Standard Scenario on an aggregated basis, but with disclosure of aggregation benefit observed
	14 Refresh prescribed policyholder behavior assumptions to align with industry experience
	15 Use the Standard Scenario construct to govern model choices and actuarial assumptions only, via a reserve “add-on”

Summary of recommendations

2 of 2

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Framework	Recommendation
Standard Scenario	16 Calculate Standard Scenario based on company-specific market paths (selected from a panel of standardized paths)
	17 Allow the Standard Scenario Amount to be calculated as a CTE Amount with prescribed assumptions
C3 charge	18 Calculate C3 as the difference between total statutory reserve and CTE 95 on same distribution
	19 Permit smoothing to be conducted on the C3 charge, but not on the Total Asset Requirement
Disclosure requirement	20 Disclose Sharpe ratio and correlations for all funds not generated by mapping to the VM-20 scenario generator
	21 Disclose modeled vs. actual hedge performance over the past 12 to 36 months for explicit CHDS reflection
	22 Disclose historical Greek coverage over the past 12 to 36 months for implicit CDHS reflection
	23 Disclose positioning of the dollar amount of CTE (“best-efforts”) relative to the unhedged CTE and fair value
	24 Disclose a “cumulative decrement” analysis under companies’ own and prescribed Standard Scenario assumptions
Other topics	25 Increase admissibility limit for designated VA hedges
	26 Increase admissibility limit for VA-related DTAs
	27 Endorse hedge accounting for interest rate derivatives that are part of VA hedge programs
	28 Allocate aggregate reserve to seriatim level based on Present Value of Accumulated Product Cash Flows

Key benefits offered by the recommendations

Better alignment with economic risk reduces disincentives to hedge

- Lowers balance sheet volatility for companies with economically-focused hedging. Benefit is driven by:
 - Better alignment of liability market sensitivities with those of hedge assets
 - More stable C3 charge and resultant RBC ratios
 - Greater hedge credit permitted for companies with accurate hedge modeling

Greater comparability across companies and products

- Harmonizes common modeling approaches and assumptions not idiosyncratic to individual companies – e.g., capital markets scenarios
- Aligns statutory framework for VA more closely to that for life products – i.e., VM-20

Enhanced oversight of company assumptions via Standard Scenario

- Revised Standard Scenario focuses on governing model choices and actuarial assumptions
- Prescribed actuarial assumptions in revised Standard Scenario were calibrated based on large-scale experience study conducted during QIS II

Simpler to interpret






- RBC ratio provides greater signal value, as fewer companies have zero C3 charge – driven by reduced ability for voluntary reserves and DTA generated by statutory-to-tax reserve differences to offset C3
- Enhanced disclosures make transparent to regulators the impact of key modeling choices on scenario generation, hedge reflection, and actuarial assumptions without requiring an in-depth model review




Simpler to calculate

- Reduces total number of calculations - i.e., one stochastic calculation for both reserves and RBC, and one Standard Scenario calculation that is aligned with the stochastic projection methodology
- *While some Std. Scenario assumptions are complex, Oliver Wyman has provided detailed illustrations*

Oliver Wyman's assessment of the recommended framework changes

Recommendations reduce four of five cited motivations for captive use

Motivation	Effectiveness of Oliver Wyman recommendations	
1 Mitigate non-economic volatility in statutory capital ratios		<ul style="list-style-type: none"> • More stable C3 charge calculation materially reduces the volatility in the denominator of statutory capital ratios – and thus the ratio itself
2 Align market risk profiles of the funding requirements and the insurer target hedge program		<ul style="list-style-type: none"> • Revised framework retains “book value” liability valuation properties of current framework for unhedged exposures • However, revised framework allows economic hedging to turn statutory reserve into effectively a fair value reserve, thereby fully aligning asset and liability market sensitivities in most IR conditions • <i>Nonetheless, in high IR conditions hedge accounting is needed to align asset-liability sensitivities fully as reserves are bound by the CSV floor</i>
3 Mitigate funding requirement in downturn scenarios (net of the hedging strategy)		<ul style="list-style-type: none"> • More stable C3 charge calculation reduces need to fund multiples of an unstable, potentially “ballooning” C3 charge in stress • Reduces capital buffer required for companies to meet target RBC ratios post-stress if they are hedging the market risk of the portfolio extensively
4 Consolidate exposures from across legal entities		<ul style="list-style-type: none"> • Not addressed by recommendations – as regulator discomfort with captive usage is unlikely to apply for this particular use case, and companies may still remain within current non-captive reserve and capital framework
5 DTA admissibility		<ul style="list-style-type: none"> • Not tested in QIS II, but expected to be fully effective – if implemented – given the direct nature of this motivation for using captives

 High effectiveness
  Medium effectiveness
  Low effectiveness

Oliver Wyman's assessment of the recommended framework changes

Recommendations adhere to our five framework enhancement objectives

Enhancement objectives		Effectiveness of 2016 Oliver Wyman recommendations	
Framework requirements	Ensure robustness of funding requirements	M	<ul style="list-style-type: none"> Improves risk sensitivity and signal value of the RBC ratio by reducing sharply the offset in C3 charge per dollar of voluntary reserves posted Improves consistency in interpretation of statutory guidelines and projection of risk factors outside companies' control – e.g., economic scenarios
	Promote sound risk management	M	<ul style="list-style-type: none"> Reduces total balance sheet volatility – both in surplus and required capital – for companies with extensive, fair value-focused hedge programs Hedging reduces funding required to meet typical insurer RBC ratios in most market conditions; however, hedging may still increase TAR
	Promote comparability	H	<ul style="list-style-type: none"> Revised framework uses harmonized scenarios for interest rates and separate account returns and aligns closely with VM-20 in general account modeling
Design choices	Preserve current statutory construct where feasible	H	<ul style="list-style-type: none"> Current AG 43 statutory construct largely retained; proposed changes in revised framework apply only to select elements of the overall projection C3 change deviates materially from C3 Phase II, but uses AG 43 chassis
	Minimize implementation complexity	?	<ul style="list-style-type: none"> As revised framework retains much of the AG 43 calculation construct, implementation complexity should be modest – though TBD based on more detailed company feedback

H High effectiveness

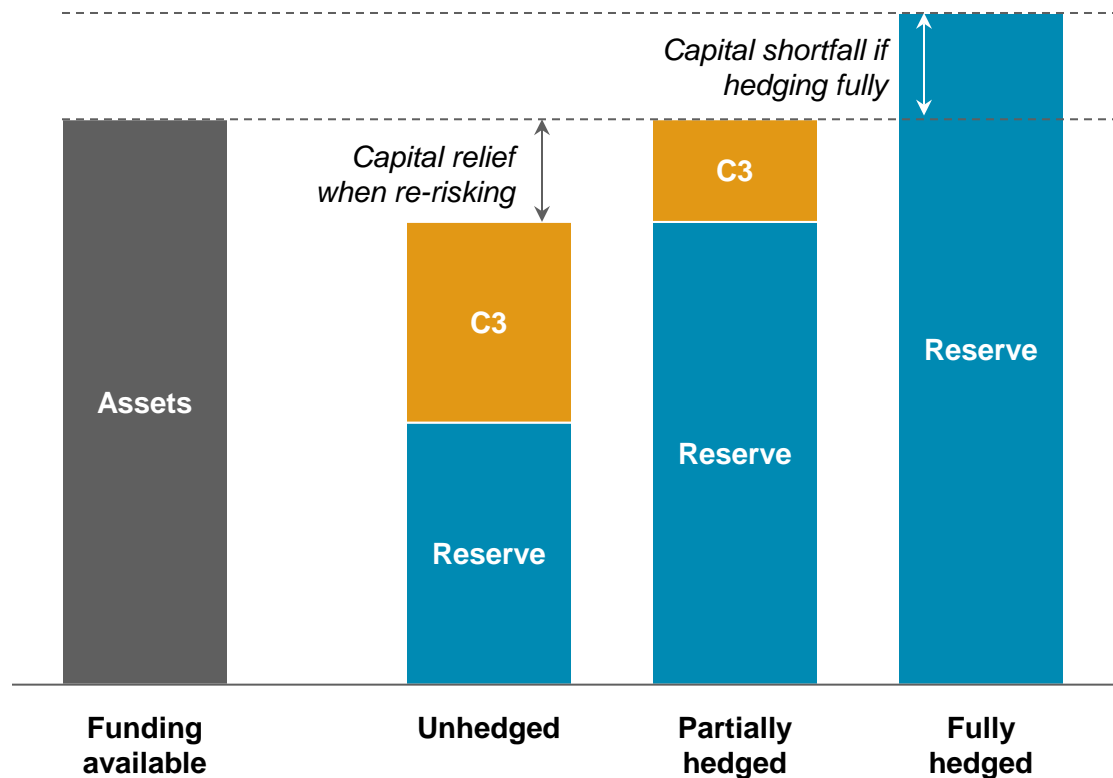
M Medium effectiveness

L Low effectiveness

□ Discussed in greater detail on the next page

Though revisions reduce disincentives to hedge, hedging still increases TAR with '16YE IR – which may incentivize reductions in hedging near insolvency

Assets vs. TAR for a sample company under different hedge strategies Under today's interest rate environment



- Revised framework enables hedging to reduce assets required to reach a typical target RBC ratio in most market conditions
- This criterion was agreed in a VAIWG call and formed the basis behind the calibration of the CTE 95 parameter for calculating C3
- However, we were unable to ensure that hedging reduces TAR in low interest rate conditions – including current conditions
 - Cost of hedging in low IR conditions exceeds CTE 70 unless underlying CTE scenarios are overhauled
 - Required changes to scenarios would increase reserves and TAR substantially (e.g., link equity returns with interest rates)
- Thus, as a company's assets approach TAR, it would be incentivized to release hedges to lower TAR and increase RBC ratio
- The company also cannot hedge more if it hasn't already, as hedging would "lock in" its loss and lead to immediate breach of TAR

We view this property as the key remaining weakness in the framework, as it increases reliance on regulator intervention for companies experiencing financial distress

Recommended recalibration of the VM-20 scenario generator would result in separate account investment return scenarios with higher volatility (1/2)

Characteristics of calibration window for current vs. recommended equity scenarios

Based on daily S&P Total Return data,¹ obtained from Bloomberg

	Current	Recommended
Data window	1955.12 to 2003.12	1927.12 to 2016.12
Calibration window characteristics		
Annualized volatility	14.7%	18.8%
<ul style="list-style-type: none"> Realized volatility expressed on an annualized basis 		
Geometric mean return	10.0%	8.9%
<ul style="list-style-type: none"> Represents annualized return over full time horizon 		
Arithmetic mean return	11.9%	11.2%
<ul style="list-style-type: none"> Represents simple average of year-on-year returns 		

Current VM-20 generator embeds an arithmetic mean return of 8.75% for US diversified equity scenarios; in recalibrating the VM-20 generator, we recommend maintaining the same arithmetic mean return constraint given that the two calibration windows have similar arithmetic mean returns

Compared to the current equity calibration criteria, we expect that the recalibrated scenarios would lessen the incentives to reduce hedging for companies approaching insolvency, as described on the prior page

1. Index comprises 90 companies prior to 1957 and 500 companies thereafter.

Recommended recalibration of the VM-20 scenario generator would result in separate account investment return scenarios with higher volatility (2/2)

Characteristics of US diversified equity returns

Current VM-20 generator vs. recommended recalibrated VM-20 generator; across 10,000 scenarios

Gross Wealth Factors across 10,000 scenarios	Current VM-20 generator						Recalibrated VM-20 generator					
	%'ile	1Y	5Y	10Y	15Y	20Y	%'ile	1Y	5Y	10Y	15Y	20Y
2.5%	78%	71%	79%	91%	112%	2.5%	73%	59%	63%	69%	80%	
5.0%	83%	80%	92%	110%	141%	5.0%	79%	71%	76%	88%	107%	
10.0%	88%	93%	112%	142%	180%	10.0%	86%	85%	96%	117%	144%	
20.0%	95%	109%	140%	186%	246%	20.0%	94%	103%	127%	163%	210%	
30.0%	101%	122%	163%	223%	309%	30.0%	100%	118%	152%	203%	273%	
50.0%	108%	145%	211%	302%	437%	50.0%	108%	144%	206%	290%	413%	
70.0%	116%	172%	269%	407%	617%	70.0%	117%	174%	273%	410%	616%	
80.0%	122%	190%	311%	490%	758%	80.0%	123%	195%	321%	505%	783%	
90.0%	130%	219%	382%	630%	1030%	90.0%	132%	229%	406%	680%	1104%	
95.0%	136%	248%	448%	787%	1299%	95.0%	140%	263%	489%	872%	1449%	
97.5%	142%	274%	521%	929%	1603%	97.5%	148%	298%	579%	1073%	1858%	

Scenario mean returns over first 20 years

Arithmetic mean	8.82%	8.88%
Geometric mean	7.67%	7.33%

We encourage VAIWG and industry to hold discussions to verify or elaborate select recommendations prior to formal decision-making

Recommendation

Rationale for additional discussions

- | Recommendation | Rationale for additional discussions |
|---|---|
| 2 Use VM-20 scenario generator for separate account returns, but recalibrated based on data from 1926 to 2016 | <ul style="list-style-type: none">• Regulators requested to review results using equity scenarios with higher volatility, calibrated with data from before and during the Great Depression, but did not specify explicit desire to adopt such scenarios• In considering the recommendation, VAIWG should decide on:<ul style="list-style-type: none">– Importance of promoting hedging at TAR funding level– Degree of conservatism relative to history needed given structural and parametric uncertainty in historical scenario calibration– Relevance of historical data outside the current calibration window• Other desirable framework properties are retained with the existing VM-20 generator and use of CTE 98 when calculating C3 |
| 10 Differentiate treatment of non-guaranteed revenue sharing income by affiliated funds vs. non-affiliated funds | <ul style="list-style-type: none">• Select regulators expressed views against stated recommendation that relaxes revenue sharing restrictions in reserve calculation, though no consolidated direction was provided by the VAIWG overall |
| 13 Project Standard Scenario on an aggregated basis, but with disclosure of aggregation benefit observed | <ul style="list-style-type: none">• Select regulators expressed views against stated recommendation, favoring a prohibition of aggregation benefits, though no consolidated direction was provided by the VAIWG overall |
| 19 Permit smoothing to be conducted on the C3 charge, but not on the Total Asset Requirement | <ul style="list-style-type: none">• Recommendation affects signal value of RBC ratio and quality of TAR• However, effects were not explicitly tested or discussed during QIS II |
| 28 Allocate aggregate reserve to seriatim level based on Present Value of Accumulated Product Cash Flows | <ul style="list-style-type: none">• Item not explicitly tested in QIS I or QIS II given no implications on total portfolio funding requirements or balance sheet sensitivity• However, potential tax implications will require more time to assess |

In addition, we suggest a three-year automatic transition (“phase-in”) period with allowance for additional extensions for qualifying companies

Rationale for suggestion

Details

1 Revisions are unprecedented in magnitude relative to prior NAIC Model Law revisions, with potential for significant solvency effects for select companies

- **Rapid advancement:** change from “no guidelines” to proposed “second generation” guidelines within industry portfolio lifespans
- **No grandfathering:** exposes in-force business to a framework for which it was neither priced nor managed in intervening time period

2 Precedent for non-grandfathered framework overhauls support longer phase-ins

- Solvency II in Europe and Economic Balance Sheet in Bermuda both allow 16-year transition periods
- IFRS 9 is proposed to have a transition period of up to five years
- Principles Based Reserving has a transition period of three years

3 Additional phase-in time would enable companies to comply better with the framework changes

- Depending on the company, such activities may include:
 - Capital raising
 - Hedge program restructuring
 - In-force management actions – e.g., reinsurance, liability management

Limitations of the QIS II results underlying our recommendations

Limitation	Description
1 Reliance on correctness of company submissions	<ul style="list-style-type: none">• Oliver Wyman relied on accurate participant data submissions for most QIS II analyses• <i>Oliver Wyman worked with participants to verify correctness and confirm interpretation of each company submission to mitigate risk of erroneous submissions</i>
2 Limited company submissions for certain calculations requested in QIS II	<ul style="list-style-type: none">• Several calculations received few company submissions – i.e., fewer than 10, limiting the extent of certain evaluations<ul style="list-style-type: none">– Fair value of options and guarantees, used to evaluate impact of revisions on a company with a replication-of-guarantees-based hedging strategy– Tax reserves in stressed market conditions, used to evaluate the RBC impact of time-zero difference between statutory and tax reserves– Cell-level Standard Scenario results, used to evaluate diversification benefit
3 Limited experience data supporting select Standard Scenario assumptions	<ul style="list-style-type: none">• Experience for certain components of prescribed actuarial assumptions is sparse<ul style="list-style-type: none">– Out-of-surrender charge period lapse rates for deeply in-the-money contracts– Withdrawal rate for GMWBs immediately after the end of the deferral bonus period• Select industry product features have no experience; prescribed assumptions for these features, accordingly, required more judgment
4 Standard Scenario actuarial assumptions are simplified representations of observed experience	<ul style="list-style-type: none">• Prescriptions reflect most material drivers and skews of policyholder behavior typically observed by Oliver Wyman• Additional dimensions were not systematically assessed – e.g., differentiation across distribution channels, existence of “survival bias” or “improvement” trends

1 | Recommended framework revisions
CTE Amount

Summary of recommended framework revisions

CTE Amount – 1 of 2

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Topic	Recommendation	Details
Scenario definition	1 <i>Use VM-20 generator for interest rates</i>	<ul style="list-style-type: none"> Designate VM-20 scenario generator as prescribed interest rate generator, using same parameters as those used in VM-20 – i.e., including NAIC’s MRP formula to set long-term mean interest rate
	2 <i>Use VM-20 generator for separate account returns, but recalibrated based on data from 1926 to 2016</i>	<ul style="list-style-type: none"> Designate VM-20 scenario generator as prescribed scenario generator for separate account returns, using parameters calibrated based on historical major US stock index returns from 1926 to 2016 Require separate account funds to be mapped to a combination of funds from VM-20 generator; for funds that cannot be suitably mapped, allow use of a proprietary generator – but require disclosure of: <ul style="list-style-type: none"> – Methodology undertaken to project returns for these funds that cannot be mapped – Sharpe ratio for each fund, as compared against Sharpe ratios of funds projected by VM-20 generator – Average correlations, across all scenarios, of these funds with funds projected by VM-20 generator
	3 <i>Allow proprietary generators if and only if they do not reduce TAR</i>	<ul style="list-style-type: none"> Notwithstanding above, allow a company to qualify a proprietary generator for projecting interest rates and separate account returns if – and only if – on an annual basis, the company can demonstrate that use of the proprietary generator produces a TAR no less than that produced using prescribed generator
	4 <i>Introduce principles to govern implied volatility, with a prescribed “safe harbor” approach</i>	<ul style="list-style-type: none"> Projected implied volatility surface should be non-arbitrageable; relationships between implied volatility, realized volatility, and short-term asset performance should be consistent with historical data Disallow the Total Asset Requirement to be reduced by assumptions of any realized “spread” between projected implied and realized volatility Prescribe a “safe harbor” approach, where modeled hedge assets comprise only linear instruments
GPVAD calculation	5 <i>Remove Working Reserve</i>	<ul style="list-style-type: none"> Align with VM-20 in setting the Working Reserve to zero when calculating Scenario GPVAD
	6 <i>Discount deficiencies at the Net Asset Earned Rate on Additional Assets</i>	<ul style="list-style-type: none"> In determining Scenario GPVAD, discount accumulated deficiencies at the Net Asset Earned Rate on Additional Assets, defined as earned rate – net of expected credit losses and investment expenses – on general account assets that do not constitute part of the Starting Asset Amount
Asset projection	7 <i>Follow VM-20 guidance on general account assets</i>	<ul style="list-style-type: none"> For net investment income projections on general account invested assets, follow asset assumptions prescribed in VM-20 – with an additional constraint applied on borrowing costs

Summary of recommended framework revisions

CTE Amount – 2 of 2

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

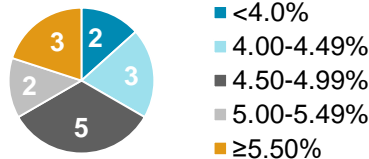
Topic	Recommendation	Details
Asset projection	8 <i>Permit simplified reflection of hedging</i>	<ul style="list-style-type: none"> • Permit immediate liquidation of currently-held hedge assets in the AG 43 “adjusted” run • Permit non-reflection of hedge accounting and unrealized hedge gains or losses in all projections
	9 <i>Reduce minimum CDHS “error factor”, but require back-testing to support chosen “error factor”</i>	<ul style="list-style-type: none"> • Replace the current AG 43 “effectiveness factor” calculation for weighting CTE (“best-efforts”) and CTE (“adjusted”) with the C3 Phase II “error factor” calculation • 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
Liability projection	10 <i>Differentiate treatment of non-guaranteed revenue sharing income by fund affiliation</i>	<ul style="list-style-type: none"> • For affiliated funds, retain the current AG 43 requirement for reducing a company’s best-estimate projection of non-guaranteed revenue sharing income • For non-affiliated funds, replace the current AG 43 requirement with the C3 Phase II requirement – i.e., use of the company’s Prudent Estimate without prescribed reduction scale in the projected income, capped at 90% of the company’s best-estimate

1 Use VM-20 economic scenario generator for interest rate scenarios

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.,

2015YE long-term mean interest rate assumption used by the 15 QIS I participants in 2016



Recommendations

- Designate VM-20 interest rate generator as prescribed generator; key features are:

- A Starting yield curve set to equal prevailing yield curve as of valuation date
- B Generator follows a stochastic log volatility-based process, projecting 1-year UST and the 20-year UST, with other points on the term structure interpolated
- C Interest rate volatility is proportional to interest rate level – which reflects history in high IR environments but not in low IR environments
- D 20-year UST reverts back to a target rate – the mean reversion point (“MRP”)
- E A hard floor of 1 bps is applied at all times to all points on the term structure

- Set the long-term mean interest rate using the NAIC’s MRP formula used in VM-20

VAIWG guidance in QIS II

- Oliver Wyman previously recommended modifying the VM-20 generator to allow for negative interest rates and higher volatility in low interest rate conditions
- VAIWG decided not to evaluate these additional modifications during QIS II

Rationale for recommendations

Ensure robustness of funding requirements

- Current framework does not provide adequate guidance to interest rate scenario projections
- Given long-term nature of liability cash flows, long-term interest rate trajectory impacts reserve and capital requirements substantially

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

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

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

2 Use VM-20 economic scenario generator for separate account returns, but with parameters recalibrated based on data from 1926 to 2016

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%

- Criteria originally set based on historical S&P Total Return data from 1955 to 2003

Recommendations

- Designate VM-20 generator as the prescribed ESG for separate account returns, but with parameters calibrated based on S&P Total Return data from 1926 to 2016 while maintaining the 8.75% mean arithmetic return embedded in current criteria

Characteristics of prescribed scenarios for US diversified equities

Percentile	1 year	5 years	10 years	20 years
2.5%	-28%	-38%	-43%	-17%
5.0%	-21%	-29%	-31%	+14%
10.0%	-13%	-16%	-6%	+44%

- Require all funds to be mapped to a combination of funds from VM-20 generator; for funds that cannot be suitably mapped, allow proprietary ESG – with disclosure of:
 - Methodology undertaken to project returns for these funds that cannot be mapped
 - Sharpe ratio for each fund vs. Sharpe ratios of funds projected by VM-20 generator
 - Correlations of these funds vs. funds projected by VM-20 generator

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Reflects longer data history than current criteria across a broader range of interest rate conditions
- Enables funding requirement benefits – or reduces funding requirement penalties – from hedging at lower CTE levels than under current calibration criteria, particularly in low interest rate conditions
- Reduces reliance on regulators to encourage hedging by weakly capitalized companies

Promote comparability

- Promotes greater consistency and comparability in stochastic run results across companies
- Greater alignment with VM-20 helps to harmonize statutory framework across different product types

Minimize implementation complexity

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

VAIWG guidance in QIS II

- Oliver Wyman previously recommended linking equity calibration criteria to interest rate MRP*
- VAIWG decided not to evaluate this linkage*

3 Allow companies to use proprietary economic scenario generators if – and only if – they do not reduce Total Asset Requirement

Current framework

- Proprietary ESGs permitted for all risk factors – including interest rates and separate account returns for all funds – under AG 43 and C3 Phase II, though VM-20 requires use of prescribed generator for both interest rates and separate account returns

Recommendations

- Notwithstanding the recommendations outlined on the prior two pages, permit use of proprietary ESGs in place of VM-20 generator if and only if it can be demonstrated, on an annual basis, that such ESG use does not reduce Total Asset Requirement

Allowance of proprietary ESG use in proposed framework

	Mapped funds	Non-mapped
If company elects to use proprietary ESG and demonstrates on an annual basis that TAR is not reduced	Proprietary ESG	Proprietary ESG with required disclosures
Otherwise	VM-20 ESG	

Rationale for recommendations

Ensure robustness of funding requirements

- Allowance for proprietary ESG encourages review and challenge of VM-20 ESG
- Allows companies to use a single, integrated generator to develop scenarios for all risk factors
- Requirement that TAR cannot be reduced by use of proprietary ESG in place of VM-20 ESG governs model risk within proprietary ESGs

Promote sound risk management

- For risk management purposes, companies may need to generate more scenarios or use different time-steps than those from VM-20 ESG

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

- Proprietary ESGs are embedded within many company internal risk management processes

4 Introduce principles to govern implied volatility scenario generation, with a “safe harbor” approach provided

Current framework

- Statutory framework does not provide guidance on generation of implied volatility scenarios, which are needed to determine option prices in CDHS modeling

Recommendations

- Prescribe several governing principles for implied volatility scenario generation
 - A All projected implied volatility surfaces must be non-arbitrageable
 - B Relationships between implied volatility, realized volatility, and short-term asset performance should be consistent with historical data – e.g.,
 - Positive correlation with realized volatility in same time period and scenario;
 - Negative correlation with short-term asset performance in same time period and scenario
 - C Notwithstanding above, Total Asset Requirement should not be reduced by assumptions of any realized “spread” between implied and realized volatility
- Prescribe a “safe harbor” approach for CDHS reflection, where modeled hedge assets comprise only linear instruments not sensitive to implied volatility
 - For companies with option-based hedge strategies, this approach would require representing the strategy as a delta-rho two-Greek hedge program
 - The normally-modeled option portfolio would be replaced with a set of linear instruments that have the same first-order Greek as the original option portfolio
- For companies that project option rebalancing, require disclosure of average implied volatility upon option purchase vs. sale (but excluding currently-held options)

Rationale for recommendations

Ensure robustness of funding requirements

- Current framework does not adequately provide guidance on projecting implied volatility
- Implied volatility a key determinant of option prices in CDHS models for companies that reflect explicit rebalancing of options
- Prevents inappropriate scenario generation from producing unrealizable hedge benefits in tail scenarios that drive funding requirements

Promote sound risk management

- Proposal governs an esoteric source of model risk in CDHS reflection – and thus promotes greater regulator confidence in company CDHS credits
- Greater regulatory confidence enables greater recognition of realizable “hedge credit”

Promote comparability

- Direct governance that TAR cannot be reduced by the implied-to-realized volatility spread assumption is similar to VM-20 governance of earned spreads
 - Reserves cannot be lower than that obtained if using a 50/50 AA/A reinvestment strategy
 - Sets a regulatory floor on conservatism of assumptions without needing full prescription

5 Remove the Working Reserve when calculating scenario GPVAD

Current framework

- 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

- Set 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 WR mitigates this issue, as insurers no longer incrementally reserve for an accounting mismatch between hedge assets and the WR

Ensure robust funding requirement

- 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

6 Discount deficiencies at the Net Asset Earned Rate on Additional Assets

Current framework

- Current AG 43 guidance is relatively ambiguous with respect to the Starting Asset amount and the rate at which deficiencies should be discounted
- As a result, we have observed two different practices in industry:

Approach	Implied assets backing reserves
A 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 Iteratively solve for Starting Assets such that the CTE 70 of GPVADs is zero	Assets modeled in the final iteration of Starting Assets

- Additionally, diverse practices exist in selecting the discount rate under Approach A

Recommendations

- Allow both approaches, but require accumulated deficiencies to be discounted at the **Net Asset Earned Rate on Additional Assets**
 - 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
- Discounting a nominal deficiency at these earned rates identifies the starting balance of the “closed portfolio” of additional assets such that the accumulated value of this portfolio – principal and yield – is enough to fulfill the nominal value of the deficiency
- Accordingly, the recommended discount rate provides an approximation of Approach B without requiring computationally-intensive Starting Asset iterations

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

7 Follow VM-20 guidance on general account asset projections, with additional constraint on borrowing cost

Current framework

- For net investment income from general account invested assets, the guidelines allow reflection of companies' own spread and default cost assumptions
- Likewise, companies may reflect their own borrowing cost assumptions in the projection during time periods where borrowing is needed

Recommendations

- For net investment income projections on Starting Assets and reinvested general account assets, follow the same general account asset modeling – i.e., spread and default cost – assumptions as those prescribed in VM-20

$$\text{Net asset spread} = \text{Gross spread} - \text{Default cost} - \text{Expenses}$$

- *Gross spread*: look up tabulated NAIC benchmark gross spreads over UST using the asset's credit rating and weighted-average life; model embedded optionality in a manner consistent with current AAT practice
- *Default cost*: use NAIC-prescribed baseline figures, then apply several adjustments for credit spreads (option-adjusted spread for assets with embedded optionality)
- *Expenses*: use companies' own assumptions
- **In addition, disallow the CTE Amount to be lower than that obtained using a reinvestment portfolio of 50/50 AA/A public, non-callable corporate bonds**
- Follow VM-20 guidance on disinvestment assumptions – including borrowing cost, but with an additional constraint that borrowing cost in a given time period may not be lower than the general account earned rate

Rationale for recommendations

Ensures robustness of funding requirements

- Current framework does not adequately provide guidance on projecting long-term credit outcomes on assets backing reserves and capital
- Given long-term nature of liability, long-term credit performance of general account assets impacts reserve and capital requirements substantially
- Recommended framework revisions leverage work conducted in VM-20 development to provide more granular guidance on credit performance modeling

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

8 Permit immediate liquidation of currently-held hedges and non-reflection of mark-to-market hedge gains and losses

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 or other assets equal in amount to 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

9 Lower minimum allowable CDHS “error factor”, but require back-testing to support chosen “error factor”

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 that must be applied to the “adjusted” run depends on the framework – AG 43 vs. C3 Phase II – and the method used to reflect dynamic hedging

Weight applied to the adjusted run (“error factor”)	Reserve	RBC
Upper bound for explicit dynamic hedge modeling	30%	5%
Upper bound for implicit dynamic hedge modeling	70%	5%
Requirement if best-efforts run > adjusted run	-	0%

Recommendations

- Allow the error factor to be as low as 5% if it can be demonstrated that the “best-efforts” run reflects actual hedge performance accurately

Weight applied to the adjusted run (“error factor”)	Reserve	RBC
Upper bound for explicit dynamic hedge modeling	5%	5%
Upper bound for implicit dynamic hedge modeling	5%	5%
Requirement if best-efforts run > adjusted run	0%	0%

- Require annual back-testing disclosures to illustrate modeled hedge performance vs. actual hedge performance over past 12-36 months – see *Recommendations #20-21*
- 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

10 Differentiate treatment of non-guaranteed revenue sharing income by affiliated funds vs. non-affiliated funds

Current framework

- **AG 43:** for non-guaranteed revenue sharing income, multiply the actuary's best-estimate by the following schedule of multiplicative factors:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6+
100%	90%	80%	70%	60%	50%

- In addition, cap non-guaranteed revenue sharing income at 0.25% of separate account value per annum after the sixth projection year
- **C3 Phase II:** reflect the actuary's Prudent Estimate assumption, reflecting a margin for error related to the uncertainty of the revenue – but that is not explicitly prescribed

Recommendations

- For affiliated funds, retain current AG 43 requirement for reducing a company's best-estimate projection of non-guaranteed revenue sharing income
- For non-affiliated funds, replace the current AG 43 requirement and multiplicative factor schedule with the lower of the following two quantities:
 - Actuary's best-estimate assumption, multiplied by 100% in the first year and 90% in all subsequent projection years
 - In second and subsequent projection years, company's Prudent Estimate assumption – consistent with the current C3 Phase II guidance

Rationale for recommendations

Ensures robustness of funding requirements

- Proposal is more aligned than current AG 43 guidance with industry revenue sharing experience
- During QIS II, ACLI conducted a survey of 20 companies' experience since 2007, finding that:¹
 - Majority of funds showed no decrease in fees
 - Vast majority of changes resulted from management actions
 - Market stress has not been a material contributor to changes in revenue sharing
 - Fund closure to new sales / money has had limited impact on revenue sharing

Promote comparability

- Proposal is more aligned with level of conservatism of other elements in the framework – e.g., behavior assumptions prescribed in Standard Scenario, economic scenarios underlying CTE Amount

Preserve current statutory construct

- Maintains AG 43 guidance for affiliated funds, about which select regulators have expressed particular concerns given the ability of the parent company to alter revenue sharing arrangement

1. Survey contained select shortcomings that reduced regulator confidence in survey results; primary concern was that the survey did not differentiate between guaranteed and non-guaranteed revenue sharing arrangements in a sufficiently robust manner.

2 | Recommended framework revisions Standard Scenario Amount

Summary of recommended framework revisions

Standard Scenario Amount

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Topic	Recommendation	Details
Projection method	11 <i>Align AG 43 Standard Scenario with CTE ("adjusted")</i>	<ul style="list-style-type: none"> Calculate Standard Scenario Amount as the Scenario GPVAD using the same Starting Assets, hedge reflection, product cash flows, investment income, and reinsurance as those in CTE 70 ("adjusted") 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
	12 <i>Remove C3 Phase II Standard Scenario</i>	<ul style="list-style-type: none"> Remove C3 Phase II Standard Scenario used to calculate Total Asset Requirements; the revised AG 43 Standard Scenario continues to act as a floor for reserves – and TAR, by extension
	13 <i>Project on an aggregated basis, but with disclosure of aggregation benefit</i>	<ul style="list-style-type: none"> Allow calculation of Scenario GPVAD on a portfolio level, reflecting aggregation benefit across policies Require disclosure of Standard Scenario Amounts calculated while applying a series of per-policy cap on Present Value of Accumulated Product Cash Flows
	14 <i>Refresh prescribed actuarial assumptions to align with experience</i>	<ul style="list-style-type: none"> Differentiate prescribed behavior assumptions more finely by product and guarantee type, and reflect recent industry experience in setting the new Standard Scenario actuarial assumptions Refresh Standard Scenario actuarial assumptions, if deemed necessary by regulators, by commissioning an independent study of industry data every three years
Reserve calculation	15 <i>Use Standard Scenario to govern model assumption, via a reserve "add-on"</i>	<ul style="list-style-type: none"> Calculate reserve as CTE Amount + Additional Reserve, where Additional Reserve equals Standard Scenario Amount – aligned with CTE 70 ("adjusted") – less CTE 70 ("adjusted") and a "buffer" Set buffer to equal difference between CTE 70 ("adjusted") and CTE 65 ("adjusted")
Prescribed market path	16 <i>Calculate Standard Scenario Amount based on company-specific market paths</i>	<ul style="list-style-type: none"> Calculate Scenario GPVAD for a standardized panel of prescribed market paths under companies' own Prudent Estimate assumptions, then re-calculate the Scenario GPVAD for the two market paths closest to CTE 70 ("adjusted") under prescribed assumptions Interpolate Standard Scenario Amount based on the two market paths under prescribed assumptions
	17 <i>Allow CTE calculation with prescribed assumptions</i>	<ul style="list-style-type: none"> Allow, with regulator approval, Standard Scenario Amount to be calculated as CTE 70 ("adjusted") using prescribed actuarial assumptions in place of companies' own Prudent Estimate assumptions

11 Align AG43 Standard Scenario calculations with CTE (“adjusted”)

Current framework

- 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

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

Scenario Amount

- Calculated as Starting Assets + GPVAD, with both terms defined in the same manner as in the stochastic run

Reflection of revenue

- Actual product fees, rider fees, and commission schedules, with the same revenue sharing guidance as in the stochastic run
- Prescribed minimum maintenance expense assumptions

Hedging and reinsurance

- Modeled identically as in CTE (“adjusted”) – i.e., only currently-held hedges may be reflected

Aggregation

- Seriatim in-force used for modeling – i.e., no cell grouping
- However, aggregation across policies is permitted in the projection – see *Recommendation #13*

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 construct simplifies 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

12 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
Tax basis	After-tax	Pre-tax
Market path	More adverse, with 20% initial equity shock	Less adverse, with 13.5% initial equity shock
Discount rates	10-year CMT + 50 bps, floored at 3.0%	At-issue valuation rates
Behavior assumptions	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

13 Project Standard Scenario on an aggregated basis, but with disclosure of aggregation benefit observed

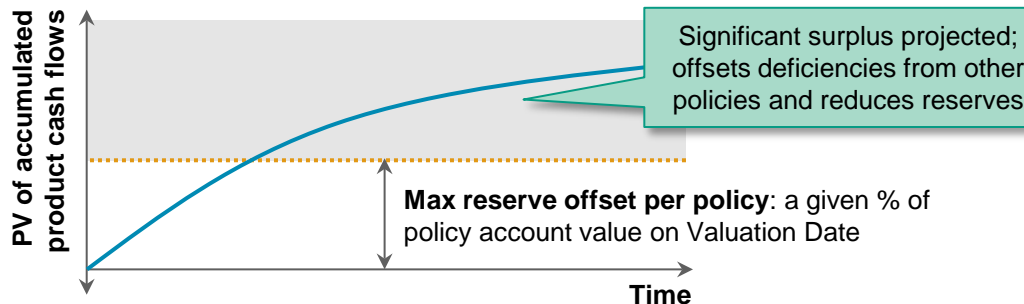
Current framework

- AG 43 calculates Standard Scenario Amount on a seriatim basis for all in-force policies; total portfolio Standard Scenario Amount is the sum across all policies
- C3 Phase II allows aggregation of cash flows across policies in calculating Standard Scenario Amount, but requires disclosure of seriatim Standard Scenario Amount

Example	Terminal PVAD	Greatest PVAD	Seriatim SSA	Agg. SSA
Policy A	150	150	150	-
Policy B	(50)	0	0	-
Portfolio	100	100	150	100

Recommendations

- Allow calculation of Scenario GPVAD on a portfolio level, reflecting aggregation benefit across policies – similar to current C3 Phase II approach
- Require disclosure of Standard Scenario Amounts calculated while applying a series of per-policy cap on Present Value of Accumulated Product Cash Flows



Rationale for recommendations

Promote comparability; Promote sound risk management

- Fully aligns the Standard Scenario projection construct with stochastic framework
- Allows Standard Scenario Amount to move in sync with CTE Amount and removes “discontinuities” in funding requirements that are difficult to hedge

Ensure robustness of funding requirements

- Consistency between stochastic and Standard Scenario constructs allows regulators to observe:
 - “Equivalent market path” driving CTE Amount
 - “Equivalent CTE level” of Standard Scenario Amount
- Aggregated, portfolio-level modeling is a more realistic depiction of expected portfolio cash flows
- Disclosure of aggregation benefit identifies size of potential risk of prescribed lapse assumptions being too low for highly profitable policies

14 Refresh prescribed policyholder behavior assumptions to align with industry experience

Current framework

- Behavior assumptions differentiate between four classes of products:

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

Recommendations

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

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

- Refresh Standard Scenario behavior assumptions by commissioning an independent study of industry experience data every three years

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Current assumptions unrealistic and do not reflect experience since framework creation
- QIS II conducted an industry-wide experience study to re-calibrate assumptions based on data, with prudence margins in targeted areas of little data
- 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

15 Use Standard Scenario construct to govern model choices and actuarial assumptions only, via a reserve “add-on” calculation

Current framework

- Used for multiple purposes and compared directly against CTE (reported)

- Govern model choices and actuarial assumptions
- Govern CDHS reflection, via allowing reflection of only currently-held hedges
- Prescribe market path across which reserves must be adequate to fund outflows
- For the AG 43 Standard Scenario, serve as the tax reserve method

Recommendations

- Per VAIWG guidance, used to “catch outliers” on model choices and assumptions
- Calculate the final reported reserve as **Stochastic Reserve + Additional Reserve**, where **Additional Reserve** equals the following:

$$\text{Additional Reserve} = \text{Std. Scen. Amount} - \text{CTE 70 (adjusted)} - \text{Buffer}$$

- Set buffer to equal difference between CTE 70 (“adjusted”) and CTE 65 (“adjusted”)
 - Prescribed Standard Scenario assumptions are calibrated to industry average
 - Size of buffer therefore represents definition of “outlier” tolerance on model choices
- Still disallow CDHS reflection; however, as Standard Scenario is no longer compared directly against CTE (reported), it cannot become binding for CDHS reasons
 - Error factor already governs model risk in CDHS reflection
 - Avoids interactions between the error factor and Standard Scenario
 - Allows Standard Scenario to focus on achieving one purpose

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Difference between Standard Scenario and CTE (“adjusted”) can be fully attributed to differences in model choices and actuarial assumptions
- Therefore, affords regulators greater transparency into companies’ model and assumption risk profile based on Standard Scenario results
- Use of a reserve add-on applied to CTE (reported) allows Standard Scenario Amount to be aligned with CTE (reported) in market-sensitivity, which facilitates ease of hedging

Minimize implementation complexity

- Focusing Standard Scenario on governing model choices eliminates need for complex prescriptions of CDHS reflection in the Standard Scenario

16 Calculate Standard Scenario Amount based on company-specific market paths (selected from a panel of standardized market paths)

Current framework

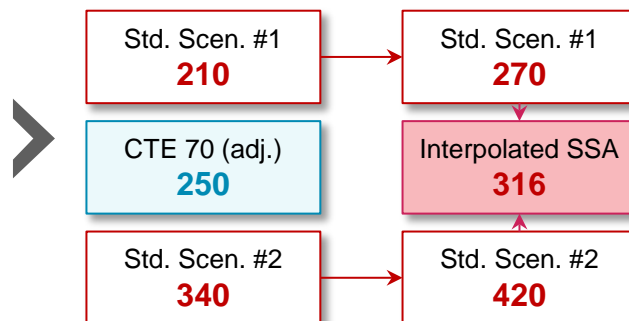
Equity returns	-13.5% initial shock, with up to 5.5% recovery each year
Bond returns	No initial shock; up to 4.85% annual return in later years
Interest rates	Not specified
Discount rates	Locked-in at-issue valuation rates, as specified by SVL

Recommendations

- Conduct the following calculation, using a panel of standardized, regulator-prescribed market paths with different initial stresses but common recovery rate after first year

- Run standard set of paths with companies' own assumptions
- Select two paths with results closest to CTE 70 (adjusted)
- Re-run with prescribed assumptions, then linearly interpolate

	Stress	SSR
1	0%	-
2	-2%	10
...		
7	-12%	130
8	-14%	210
9	-16%	340
10	-18%	550



- Require disclosure of results obtained under both companies' own assumptions and prescribed assumptions for market paths not selected

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Allows VAIWG's stated purpose for the Standard Scenario to be met more robustly
 - Given VAIWG's stated purpose, Standard Scenario Amount should be in-line with, but not exceed CTE Amount, if same model choices and assumptions are used between the two
 - Otherwise, Standard Scenario loses ability to identify companies with outlying model choices and assumptions
 - QIS II results indicated that no standardized market path can reliably produce a Standard Scenario Amount in line with CTE Amount
- Allows impact of actuarial assumption deviations to be identified immediately from reported results

Promote comparability

- Company-specific market path captures the CTE 70-equivalent scenario for all companies, whereas a standardized scenario would have different CTE equivalence for different companies
- Proposed Standard Scenario construct therefore measures **joint market-actuarial risk** consistently
 - i.e., at the CTE 70 level – across all portfolios

17 Allow the Standard Scenario Amount to be calculated as a CTE Amount with prescribed assumptions

Current framework

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

Recommendations

- Permit companies to calculate Standard Scenario Amount in the same manner as CTE 70 (“adjusted”), but with the following exceptions:
 - Companies’ own Prudent Estimate assumptions and maintenance expense assumptions should be replaced with prescribed Standard Scenario assumptions
 - Modeled in-force should be consistent with Standard Scenario instructions – i.e., seriatim in-force required, with no cell grouping permitted
 - For disclosure purposes, the per-policy cap on Present Value of Accumulated Product Cash Flows should be applied in each projection scenario
- Require companies that elect this option for calculating Standard Scenario Amount to disclose results from company-specific market path approach outlined on prior page
 - Standard Scenario Amount calculated under company-specific path approach
 - Results obtained under both companies’ own assumptions and prescribed assumptions for market paths not selected

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Allows VAIWG’s stated purpose for the Standard Scenario to be met more robustly
 - Given VAIWG’s stated purpose, Standard Scenario Amount should be in-line with, but not exceed CTE Amount, if same model choices and assumptions are used between the two
 - Otherwise, Standard Scenario loses ability to identify companies with outlying model choices and assumptions
 - QIS II results indicated that no standardized market path can reliably produce a Standard Scenario Amount in line with CTE Amount
- Allows impact of actuarial assumption deviations to be identified immediately from reported results

Promote comparability

- Proposed Standard Scenario construct measures **joint market-actuarial risk** consistently – i.e., at the CTE 70 level – across all portfolios

3 | Recommended framework revisions RBC C3 Charge

Summary of recommended framework revisions

RBC C3 Charge

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Topic	Recommendation	Details
C3 charge calculation	18 Calculate C3 as difference between reserve and CTE 95 on same distribution	<ul style="list-style-type: none"> Prescribe the C3 Charge calculation as: $C3 = 25\% \times ((CTE\ 95_{Pre-tax} + \text{Additional Reserve} - \text{Statutory Reserve}) \times (1 - FIT) - (\text{Statutory Reserve} - \text{Tax Reserve}) \times FIT)$ Where: <ul style="list-style-type: none"> CTE 95 is calculated on the same distribution of Scenario Reserves as that used to calculate the minimum statutory reserves Additional Reserve is determined from the Standard Scenario calculation outlined in Recommendations #15-17 Stat. Reserve may include voluntary reserves Allow companies to, with regulatory approval and with disclosure of the C3 amount as calculated above, project taxes explicitly in the projection of CTE 95 and set C3 as: $C3 = 25\% \times (CTE_{After-tax} + \text{Additional Reserve} \times (1 - FIT) - \text{Statutory Reserve})$ Note that if Recommendation #2 for the CTE Amount is not adopted in its entirety, and if calibration points for US diversified equity Gross Wealth ratios are unchanged from the current levels, then CTE 95 in both equations above should be replaced by CTE 98
Smoothing	19 Permit smoothing of the C3 charge, but not TAR	<ul style="list-style-type: none"> Permit companies to apply the current C3 Phase II smoothing mechanism on the C3 charge – instead of on TAR Determine the C3 charge in any given year via the following steps: <ul style="list-style-type: none"> Calculate ratio of reported C3 to aggregate cash surrender value for prior year Calculate ratio of unsmoothed C3 to aggregate cash surrender value for current year Determine smoothed C3 based on 60% of the prior year ratio and 40% of the current year ratio

18 Calculate C3 as the difference between reserves and a CTE 95 on the same distribution of Scenario GPVADs

Current framework

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

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

- 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

- Prescribe the C3 Charge calculation as:

$$C3 = 25\% \times \left(\underbrace{(\text{CTE } 95_{\text{Pre-tax}} + \text{Add'l Reserve} - \text{Stat. Reserve})}_{\text{Capped at amount of non-admitted DTAs attributable to VA portfolio}} \times (1 - \text{FIT}) - (\text{Stat. Reserve} - \text{Tax Reserve}) \times \text{FIT} \right)$$

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

Where CTE 95 is calculated on same distribution of Scenario Reserves as that used to calculate Stat. Reserve, Add'l Reserve is determined via the Standard Scenario calculation, and Stat. Reserve may include voluntary reserves

- Allow companies to, with regulatory approval and with disclosure of C3 amount as calculated above, project taxes explicitly in the projection of CTE 95 and set C3 as:

$$C3 = 25\% \times (\text{CTE } 95_{\text{After-tax}} + \text{Add'l Reserve} \times (1 - \text{FIT}) - \text{Stat. Reserve})$$

- Require disclosure of C3 calculated via first approach and all calculation components
- If Recommendation #2 for the CTE Amount is not adopted in its entirety, and if calibration points for US diversified equity Gross Wealth ratios are unchanged from current levels, then **CTE 95** in both equations above should be replaced by **CTE 98**

Rationale for recommendations

Ensure robust funding requirements

- Using a single stochastic distribution reduces non-economic volatility in the RBC ratio
- Use of CTE 95 and ¼ scalar 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 95
 - 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 ¼ 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

19 Permit smoothing to be conducted on the C3 charge, but not on the Total Asset Requirement

Current framework

- Companies allowed to smooth Total Asset Requirement across reporting years
- Specifically, the smoothing mechanism consists of the following steps:
 - Calculate ratio of reported TAR to aggregate cash value for prior year
 - Calculate ratio of unsmoothed TAR to aggregate cash value for current year
 - Determine smoothed TAR based on 60% of the prior year ratio and 40% of the current year ratio

Recommendations

- Permit companies to apply current C3 Phase II smoothing mechanism to the C3 charge – instead of to the Total Asset Requirement
- Specifically, determine the C3 charge in any given year via the following steps:
 - Calculate ratio of reported C3 to aggregate cash value for prior year
 - Calculate ratio of unsmoothed C3 to aggregate cash value for current year
 - Determine smoothed C3 based on 60% of the prior year ratio and 40% of current year ratio
- Upon a material modification of the company's CDHS, require companies to obtain approval from domiciliary regulator prior to being able to continue smoothing

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Improves signal value of RBC ratio by reducing prevalence of companies with zero C3 charge
 - Current framework permits smoothing on TAR but not on reserve
 - Resultant C3 charge is therefore volatile and may reach zero if reserve increases sharply
 - Zero C3 charge would reduce TAR for non-economic reasons
- Unsmoothed reserve and TAR better align with hedge assets in market sensitivity
- Regulator latitude to reduce smoothing upon hedge program changes incentives maintenance of hedging and preserves signal value of RBC ratio
 - Hedge program a major determinant of portfolio market risk, which C3 intends to measure
 - Change in hedging reflects a discretionary management action, not pro-cyclicality

Preserve current statutory construct

- Maintains current smoothing mechanism to reduce pro-cyclicality of the balance sheet

4 | Recommended framework revisions Disclosure requirements

Summary of recommended framework revisions

Disclosure requirements

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Topic	Recommendation	Details
Stochastic scenarios	20 <i>Disclose Sharpe ratio and correlations for all funds not generated by mapping to VM-20 generator</i>	<ul style="list-style-type: none"> • Disclose Sharpe ratios for all funds generated with a proprietary scenario generator, where the Sharpe ratio is calculated with the long-term risk-free rate assumed in the calibration of the VM-20 generator to ensure consistency across fund types generated (currently 5.25%) • Disclose a correlation matrix that illustrates, for all funds generated with a proprietary scenario generator, average correlation across all 1,000 scenarios with each of the funds generated by the VM-20 generator
Stochastic hedge reflection	21 <i>Disclose modeled vs. actual hedge performance for explicit CHDS reflection</i>	<ul style="list-style-type: none"> • Project hedge asset gains and losses along a historical realized market path using the CTE (“best-efforts”) model, then compare projected hedge asset performance against actual performance • Permit low “error factor” only if actual hedge asset performance tracks modeled performance accurately
	22 <i>Disclose historical Greek coverage for implicit CDHS reflection</i>	<ul style="list-style-type: none"> • Compare actual hedge asset performance vs. movements in fair value of hedge target, with attribution across delta, rho, and vega to measure hedge coverage ratio for each Greek • Permit low “error factor” only if delta and rho coverage ratios are substantially similar
	23 <i>Disclose positioning of CTE (“best-efforts”) relative to unhedged CTE and fair value</i>	<ul style="list-style-type: none"> • For companies with a qualified CDHS, disclose whether CTE (“best-efforts”) is: <ul style="list-style-type: none"> – Higher than full-contract fair value, calculated in a manner consistent with FAS 133 – Equal to or lower than the full-contract fair value, but between fair value and CTE (“unhedged”) – Lower than the lesser of the full-contract fair value and CTE (“unhedged”)
Standard Scenario	24 <i>Disclose “cumulative decrement” analysis under companies’ own and prescribed assumptions</i>	<ul style="list-style-type: none"> • Under the company-specific market path approach for Standard Scenario, project the cumulative decrement pattern along the two selected market paths, distinguishing between the following: <ul style="list-style-type: none"> – Death – Full surrender – Account Value depletion – Elective annuitization – Other benefit election • Under the stochastic CTE approach for Standard Scenario, project the average cumulative decrement pattern along the worst 30% of the scenarios – i.e., those included in the calculation of CTE 70

20 Disclose Sharpe ratio and correlations for all funds not generated by mapping to the VM-20 economic scenario generator

Current framework

- Companies are required to disclose in the Supporting Memorandum the following items, among others, for scenario generation:
 - Correlation between all funds
 - “Consistency of other funds to equity funds”

Recommendations

- Apply disclosure requirements only to funds generated by a proprietary ESG given recommendation to use VM-20 generator as the prescribed generator
 - However, these funds should include volatility-control funds, as well as other funds that are projected dynamically in the liability model
 - For instance, if a company projects dynamic rebalancing of a fund based other market signals within the liability model, the returns for this fund should still be subjected to these disclosure requirements
- Clarify the types of disclosure that should be provided to illustrate “consistency of other funds to equity funds” and “correlation between all funds”
 - Sharpe ratios for all funds generated with a proprietary ESG, where the Sharpe ratio is calculated with the long-term risk-free rate assumed in the calibration of the VM-20 generator to ensure consistency across fund types (currently 5.25%)
 - Disclose a correlation matrix that illustrates, for all funds generated with a proprietary ESG, average correlation across all 1,000 scenarios with each of the funds generated by the VM-20 generator

Rationale for recommendations

Ensure robustness of funding requirements

- Provides regulators with greater transparency into whether the AG 43 principle of “no consistent out-performance without higher risk” is maintained
- Provides regulators with more robust tools to govern model risk within proprietary ESGs

Promote comparability

- Promotes greater consistency and comparability in the stochastic run results across companies

Preserve current statutory construct

- Clarifies and enforces current statutory guidance within AG 43 regarding scenario generation and disclosure requirements thereof

21 Disclose modeled vs. actual hedge performance over the past 12 to 36 months for explicit CHDS reflection

Current framework

- Companies reflecting CDHS need to demonstrate that, based on an analysis of at least the most recent 12 months, the model is able to replicate the hedging strategy in a way that justifies the “E factor” used to weight CTE (“best-efforts”) in AG 43
- Companies that do not have 12 months of experience to date should weight CTE (“best-efforts”) by no more than 30% under AG 43

Recommendations

- Project hedge asset gains and losses along realized market path in the past 12-36 months using CTE (“best-efforts”) model, then compare projected vs. actual
- Permit low “error factor” only if actual asset performance tracks modeled accurately, leveraging methods outlined in SSAP 86 for measuring hedge effectiveness
- Require companies without 12 months of history to use error factor of at least 50%

Sample back-testing disclosure for explicit CDHS reflection

	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>
Equity returns							
Interest rates							
Implied volatility							
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>
Actual hedge asset G/L							
Modeled hedge asset G/L							
Actual / modeled G/L							

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Back-testing disclosure facilitates a performance-oriented model risk governance framework and removes arbitrariness of limits on “error factor”
- Provides regulators with greater transparency into accuracy of companies’ CDHS modeling such that:
 - Companies with highly-accurate modeling may take a higher CDHS credit, which aligns its liability sensitivity better with its hedge assets
 - Companies with less accurate modeling should take a larger haircut on CDHS credit given higher model risk exhibited

Promote comparability

- Promotes greater consistency and comparability in governing hedge credit claimed across companies with diverse CDHS modeling practices

Preserve current statutory construct

- Maintains existing C3 Phase II construct of using the “error factor” to weight CTE (“best-efforts”) with CTE (“adjusted”)

22 Disclose historical Greek coverage over past 12 to 36 months for implicit CDHS reflection (calculating CDHS cost as fair value of hedge target)

Current framework

- Companies reflecting CDHS need to demonstrate that, based on an analysis of at least the most recent 12 months, the model is able to replicate the hedging strategy in a way that justifies the “E factor” used to weight CTE (“best-efforts”) in AG 43
- Companies that do not have 12 months of experience to date should weight CTE (“best-efforts”) by no more than 30% under AG 43

Recommendations

- Project historical coverage of delta and rho by tracking actual hedge asset gains and losses against fair value movements in hedged liability (attributed to delta and rho)
- Permit low “error factor” only if delta and rho coverages are comparable; otherwise, calculating CDHS cost as fair value of the hedge target is conceptually unsuitable
- Require companies without 12 months of history to use error factor of at least 50%

Sample back-testing disclosure for implicit CDHS reflection

Due to equities

	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>
ΔHedged item FV							
Actual hedge asset G/L							

Delta coverage ratio

Due to interest rates

	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>
ΔHedged item FV							
Actual hedge asset G/L							

Rho coverage ratio

Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Back-testing disclosure facilitates a performance-oriented model risk governance framework and removes arbitrariness of limits on “error factor”
- Provides regulators with greater transparency into accuracy of companies’ CDHS modeling such that:
 - Companies with highly-accurate modeling may take a higher CDHS credit, which aligns its liability sensitivity better with its hedge assets
 - Companies with less accurate modeling should take a larger haircut on CDHS credit given higher model risk exhibited

Promote comparability

- Promotes greater consistency and comparability in governing hedge credit claimed across companies with diverse CDHS modeling practices

Preserve current statutory construct

- Maintains existing C3 Phase II construct of using the “error factor” to weight CTE (“best-efforts”) with CTE (“adjusted”)

23 Disclose positioning of the dollar amount of CTE (“best-efforts”) relative to the unhedged CTE and fair value

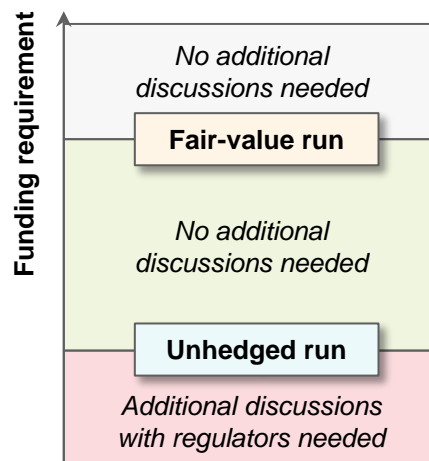
Current framework

- No comparable disclosure requirement exists

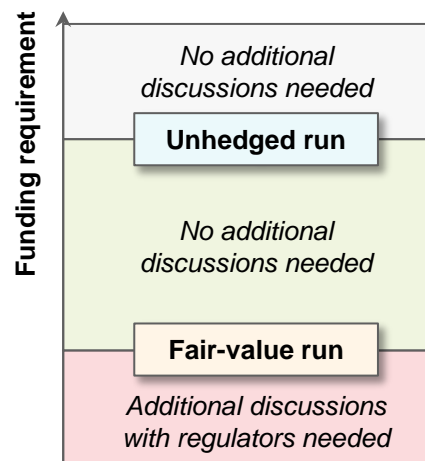
Recommendations

- For companies with a qualified CDHS, disclose whether CTE (“best-efforts”) is:
 - Higher than full-contract fair value
 - Equal to or lower than full-contract fair value, but between (i) full-contract fair value and (ii) CTE (“unhedged”)
 - Lower than lesser of (i) full-contract fair value and (ii) CTE (“unhedged”)
- If Outcome C is observed, require regulator discussion around rationale for observing Outcome C

In low interest rate environments



In high interest rate environments



Rationale for recommendations

Ensure robustness of funding requirements; Promote sound risk management

- Regions of “no additional discussion” indicate that CDHS representations do not assume any market outperformance in the stochastic scenarios
- Accordingly, disclosure helps regulators identify potential CDHS model shortcomings without requiring in-depth review of model mechanics
- Provides regulators with greater transparency into accuracy of companies’ CDHS modeling such that:
 - Companies with highly-accurate modeling may take a higher CDHS credit, which aligns its liability sensitivity better with its hedge assets
 - Companies with less accurate modeling should take a larger haircut on CDHS credit given higher model risk exhibited

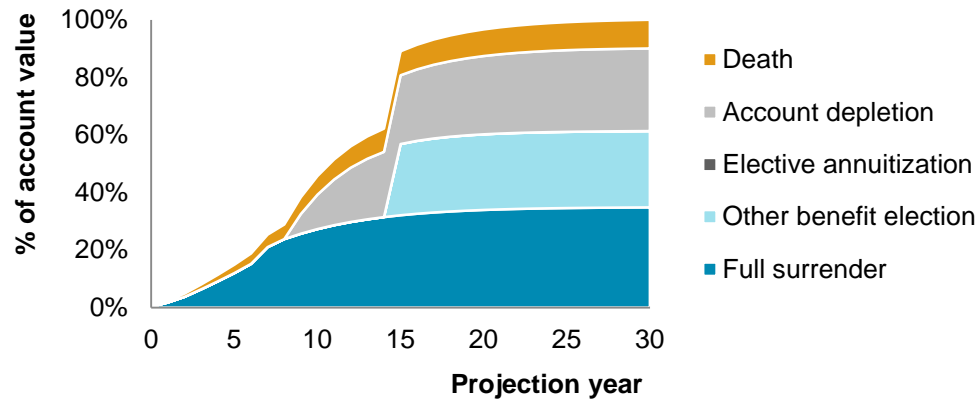
24 Disclose a “cumulative decrement” analysis under companies’ own and prescribed Standard Scenario assumptions

Current framework

- Companies are required to disclose in the Supporting Memorandum a list of actuarial assumptions and disclose the rationale for using the assumptions

Recommendations

- Under the company-specific market path approach for Standard Scenario, project the cumulative decrement pattern along the two selected market paths, distinguishing between the following types of decrements illustrated below:



- Under the stochastic CTE approach for Standard Scenario, project the average cumulative decrement pattern along the worst 30% of the scenarios – i.e., those included in the calculation of CTE 70
- Require companies to conduct analysis under their own and prescribed assumptions

Rationale for recommendations

Ensure robustness of funding requirements

- Provides regulators with greater transparency into differences between companies’ Prudent Estimate assumptions and Standard Scenario assumptions
- Captures interaction effects between different assumptions to provide direct insight into types of guarantees ultimately used by policyholders

Preserve current statutory construct

- Augments current AG 43 Supporting Memorandum disclosure requirements on actuarial assumptions with a standardized and templated exhibit

5 | Recommended framework revisions
Other topics

Summary of recommended framework revisions

Other topics

Same as 2016 proposal
 Modified from 2016 proposal
 New proposal

Topic	Recommendation	Details
Asset treatment	25 <i>Increase admissibility limit for designated VA hedges</i>	<ul style="list-style-type: none"> Sanction higher admissibility threshold for derivatives that are designated hedge instruments for a VA portfolio, originated as part of a CDHS
	26 <i>Increase admissibility limit for VA-related DTAs</i>	<ul style="list-style-type: none"> Raise the current admissibility threshold for DTAs – currently at 15% of surplus – related to the VA portfolio that are not already accounted for in the “stat-to-tax” component of the C3 charge calculation
	27 <i>Endorse hedge accounting for interest rate derivatives that are part of VA hedge programs</i>	<ul style="list-style-type: none"> NAIC SAPWG is leading an effort to prescribe hedge accounting treatment for designated derivative instruments hedging interest rate risk in VA portfolios 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"> 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) 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
Reserve allocation	28 <i>Allocate aggregate reserve to seriatim level based on PV of Accumulated Product Cash Flows</i>	<ul style="list-style-type: none"> Allocate the aggregate reserve in excess of cash value based on the lowest of the negative of contracts’ PV of Accumulated Product Cash Flows, discounted with the portfolio-level discount vector Include in Accumulated Product Cash Flows only those cash flows that are conceptually contract-level – e.g., fees and benefit payments; exclude items such as NII, hedge gains and losses, and expenses

25 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

26 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

27 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 (“ <u>TAR</u> ”)	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

- 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

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

28 Allocate aggregate reserve to seriatim level based on Present Value of Accumulated Product Cash Flows

Current framework

- Standard Scenario Amount is calculated on a seriatim basis; if Standard Scenario is binding, seriatim reserves equal Standard Scenario Amounts for each policy
- Excess of aggregate CTE Amount over Standard Scenario Amount is allocated to each policy based on difference between the policy's Standard Scenario Amount and its Cash Surrender Value on the valuation date

Recommendations

- Allocate the aggregate reserve in excess of Cash Surrender Value based on the lowest present value of the policy's Accumulated Product Cash Flows, discounted with the portfolio-level discount vector and capped at zero
- Include in Accumulated Product Cash Flows only cash flows that are conceptually contract-level – e.g., fees and benefit payments; exclude items such as NII, hedge gains and losses, and expenses

Example of aggregate reserve allocation on three sample contracts

Contract	A	B	C	Total
Cash surrender value	28	40	52	120
Lowest PV of Accumulated CFs	(70)	(30)	10	-
Aggregate Reserve				200
Allocation basis	70	30	0	-
Allocated amount	56	24	0	80
Contract-level reserve	84	64	52	200

Rationale for recommendations

Promote comparability

- Proposed allocation methodology fully aligns with contract-level cash flows projected for each contract – and therefore the contract's contribution to the aggregate reserve

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