Actuarial Society *of* Greater New York

VA STATUTORY REFORM (VM-21) METHODOLOGY & UPDATES

ASNY 2019 Annual Meeting

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3 Asset liability management considerations

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1 Overview

VA Statutory Reform (VM-21)

VM-21 is retrospective and expected to become effective 1/1/2020

Governing body & goals

- **Governing body:** NAIC and associated committees and task forces
- **Goals:** Promote adequate funding for liabilities with reasonable confidence, increase comparability across organizations, remove disincentive for hedging, and reduce non-economic volatility

Scope & timeline

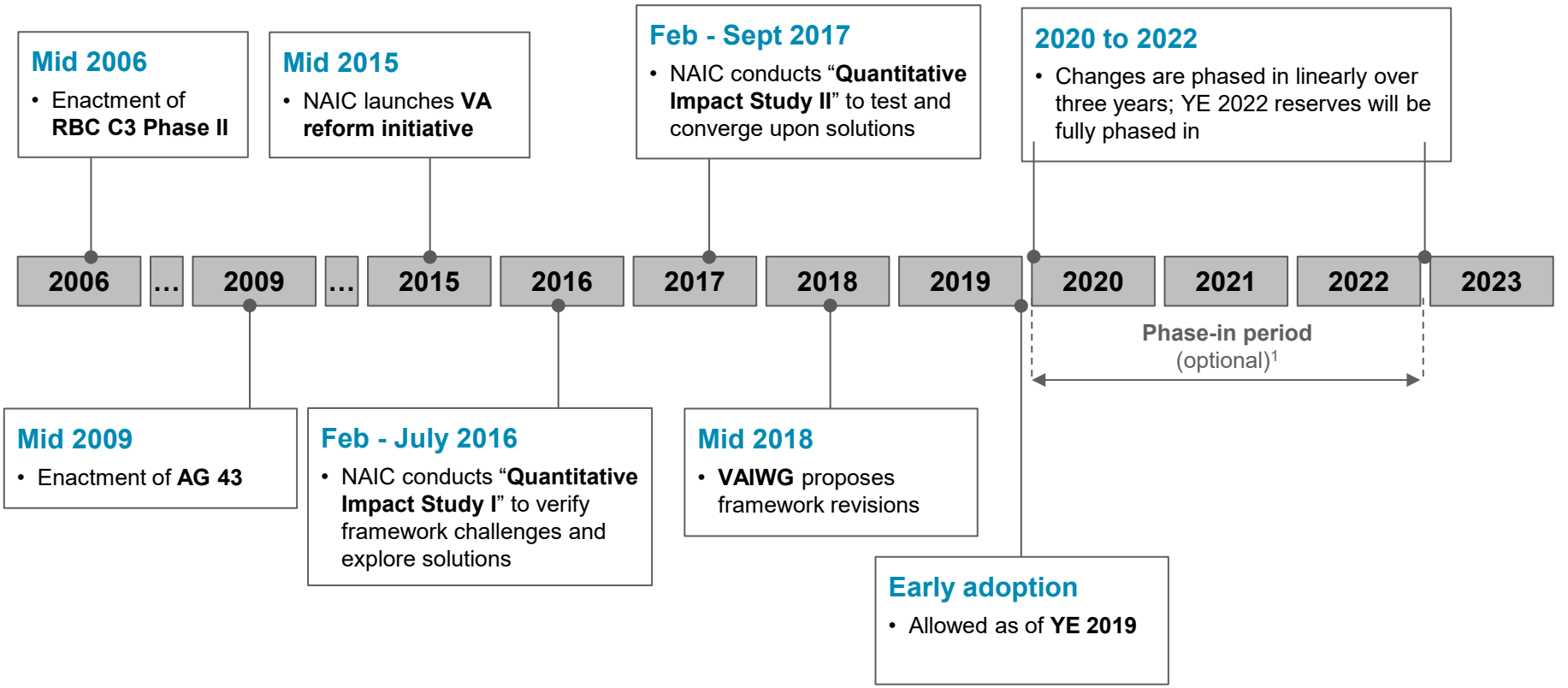
- **Effective date:** Updates to VM-21 are expected to become effective 1/1/2020 with an optional three-year phase-in period and an option for early adoption (YE 19)
- **Regulation status:** Final draft adopted at summer meeting in August

Key changes

- **Standard Projection:** Replacement of Standard Scenario with Standard Projection, requiring prudent assumption management
- **Stochastic:** Alignment of scenarios and asset projections with VM-20, methodology updates to remove non-economic volatility, and alignment of reserve and capital calculations

VA Statutory Reform history

The reform is informed by years of experience with the current framework and two Quantitative Impact Studies (QIS)



VA Statutory Reform has been several years in the making and is one of the most significant regulatory reforms in the industry.

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

VA Statutory Reform industry reaction
Quotes from leading insurance carriers

"We are supportive of the VA reform, [we] think it goes in the right direction. It's more economic than it is today. …We don't think that it has a material impact on our dividend capacity going forward."

Anders Malmstrom, CFO
August 14, 2018

Robert Falzon, CFO
August 2, 2018

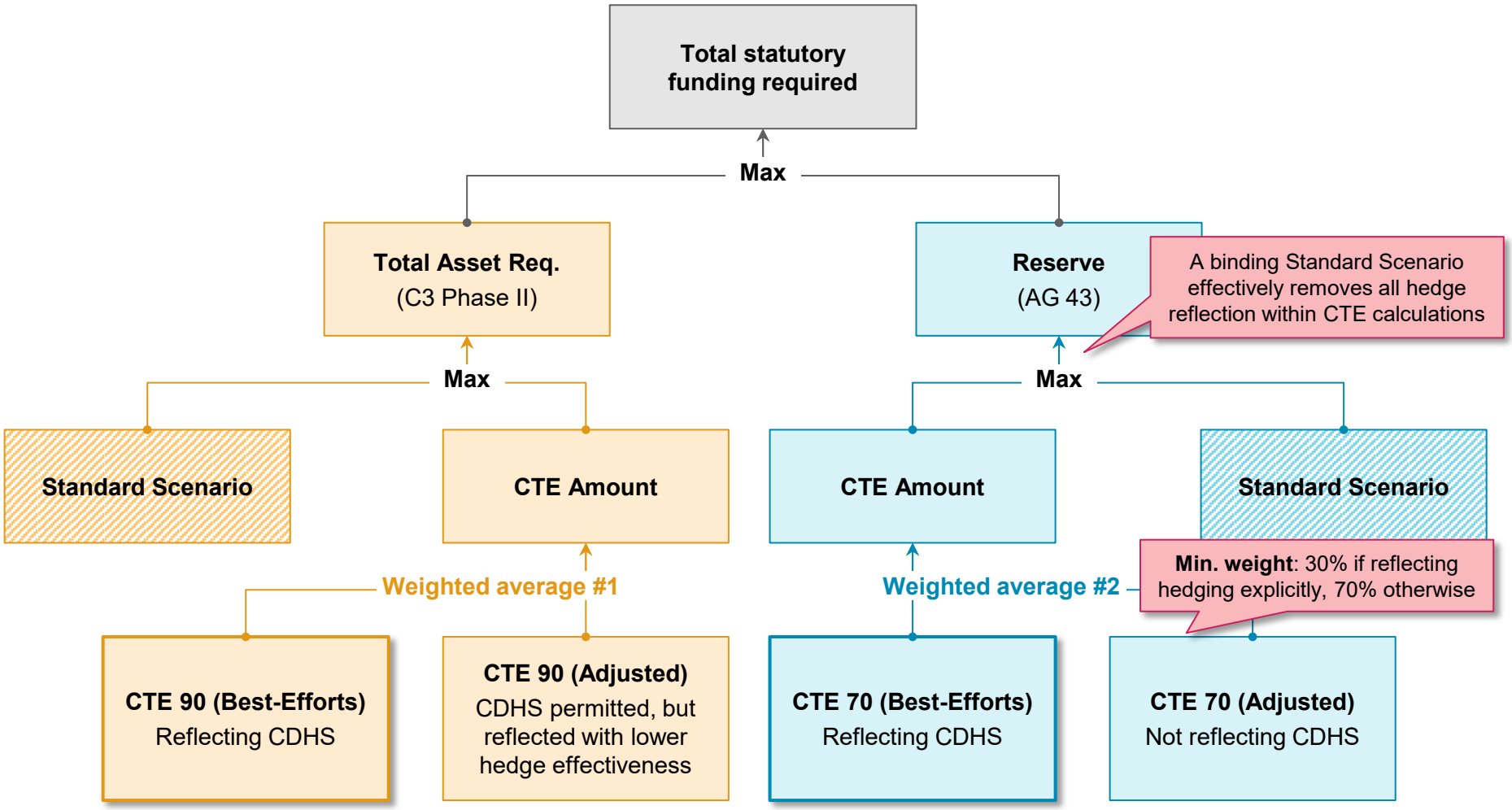
"We do not expect material impacts to capital from the proposed variable annuity statutory framework changes adopted by the NAIC Variable Annuities Issues Working Group."

"The new reserve framework should help pave the way for growth in ordinary dividend capacity in the years to come as we believe changes in reserves will better align with our hedge target."

Eric Steigerwalt, President and CEO
August 7, 2018

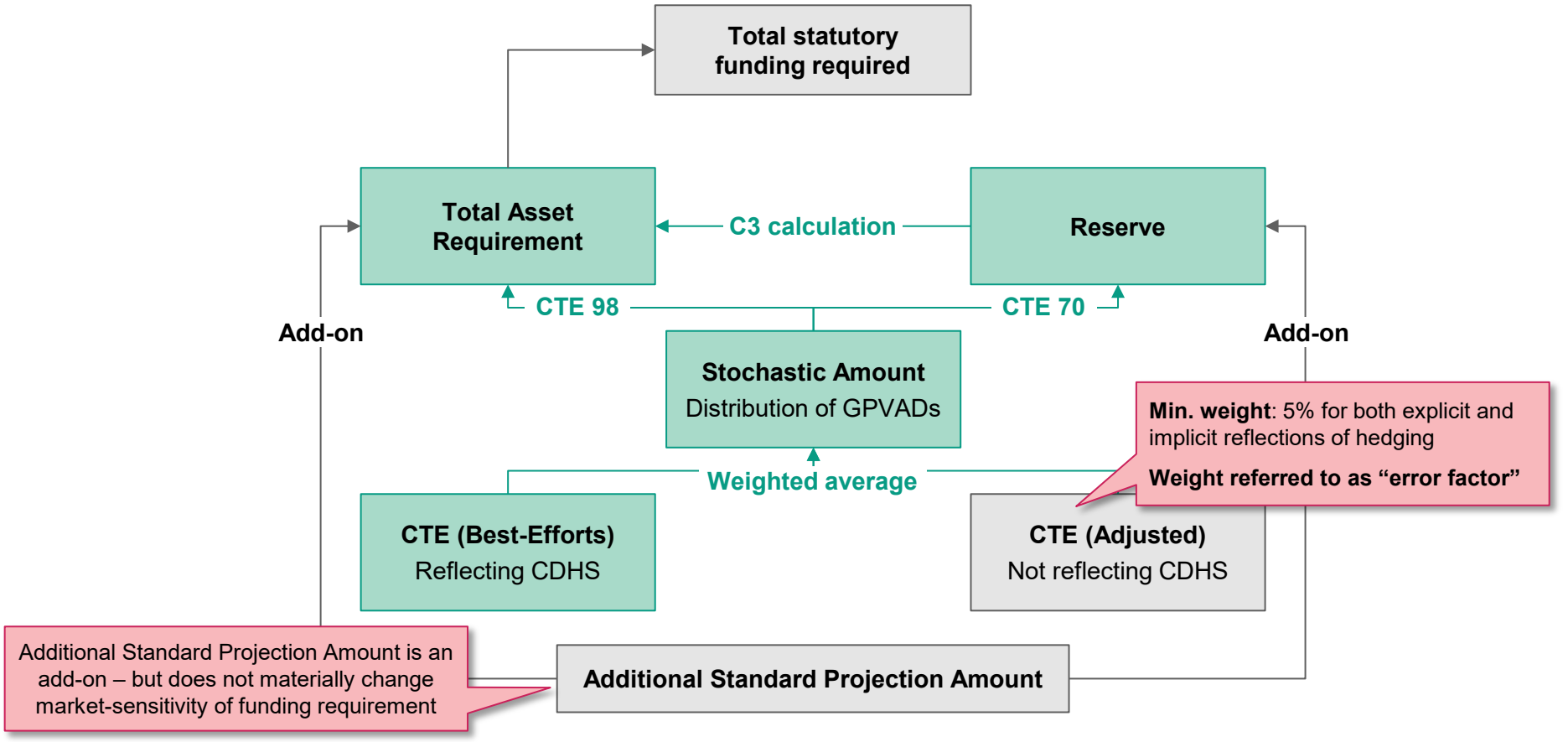
2 VM-21 updates and implications

Current framework places restrictions on reflecting hedging – both directly and indirectly (via non-linearities in calculation)



Revised statutory framework will accommodate fair value hedging

Reform reduces hedge reflection limitations and removes both Working Reserve and non-linearities that make sensitivities discontinuous



As long as a company can obtain a low "error factor," the revised statutory framework will accommodate fair value-based hedging – i.e., hedge assets and hedged statutory liabilities will have similar market-sensitivity.

Summary of VM-21 updates

High-level categories

Stochastic (CTE)	Standard scenario (SS)	C3 & other topics
1 Remove working reserves when calculating scenario GPVAD	5 Align AG43/VM-21 SS calculations with CTE "adjusted"	Calculate C3 as difference between total statutory reserve and CTE 98 on same distribution
2 Discount deficiencies at net asset earned rate on additional assets	Remove C3 Phase II standard scenario	Permit smoothing to be conducted on the C3 charge, but not on TAR
3 Use VM-20 scenario generator for interest and SA returns; only allow proprietary scenario generator when it does not materially reduces TAR	Refresh prescribed PH behavior assumptions to align with industry	Increase admissibility limit for designated VA hedges
Introduce principles to govern implied volatility scenario generation	Use SS construct to govern model choices and actuarial assumptions only	Endorse hedge accounting for interest rate derivatives that are part of VA hedge programs
4 Follow VM-20 guidance on GA asset projects	Project SS on an aggregated basis	Allocate aggregate reserve to seriatim level based on Present Value of Accumulated Product Cash Flows
Permit immediate liquidation of current hedges in CTE "adjusted" and non-reflection of MTM hedge gains or losses	Calculate SS based on company-specific market paths, select from a panel of standardized paths	Various disclosure requirement changes
Reduce minimum allowable CDHS "error factor" but require back-testing for chosen factor	Allow SS amount to be calculated as a CTE amount with prescribed assumptions	
Align conservatism margin for reflecting non-guaranteed revenue sharing income with historical experience		

1 Remove Working Reserve (WR) from the GPVAD calculation

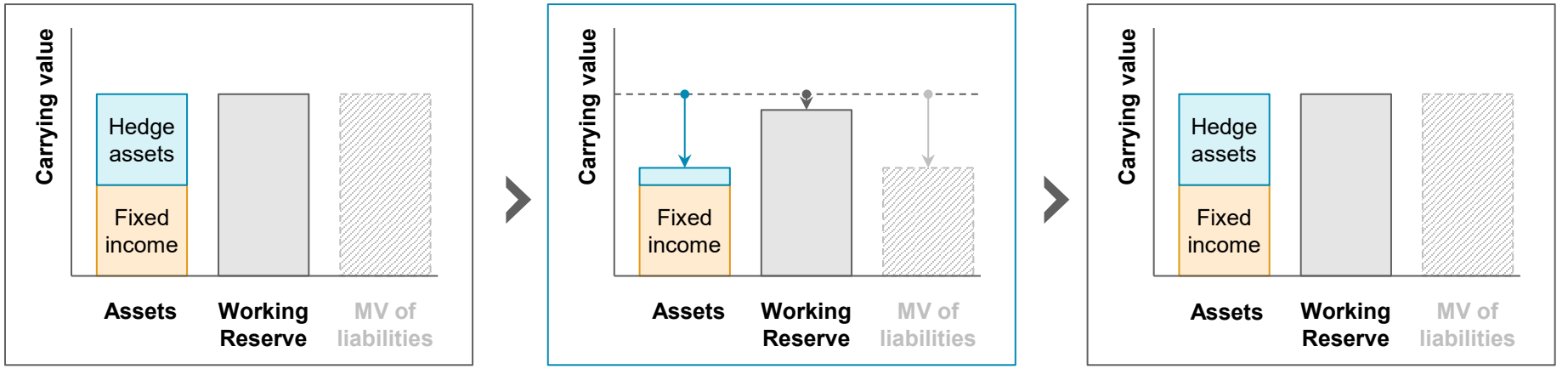
Under the current framework, changes in the market conditions result in B/S volatility as hedge gains and losses are not offset by change in WR

Balance sheet at time 0

Balance sheet at time 1
Favorable market conditions

Balance sheet at time 2
Return to *time 0* market conditions

Projected balance sheet under the existing framework



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

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

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

2 Discount rates for accumulated deficiencies

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

Current framework

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

Approach	Implied assets backing reserves
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 scenario GPVAD or CTE of GPVADs is zero	Assets modeled in the final iteration of starting assets

Revised framework

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

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

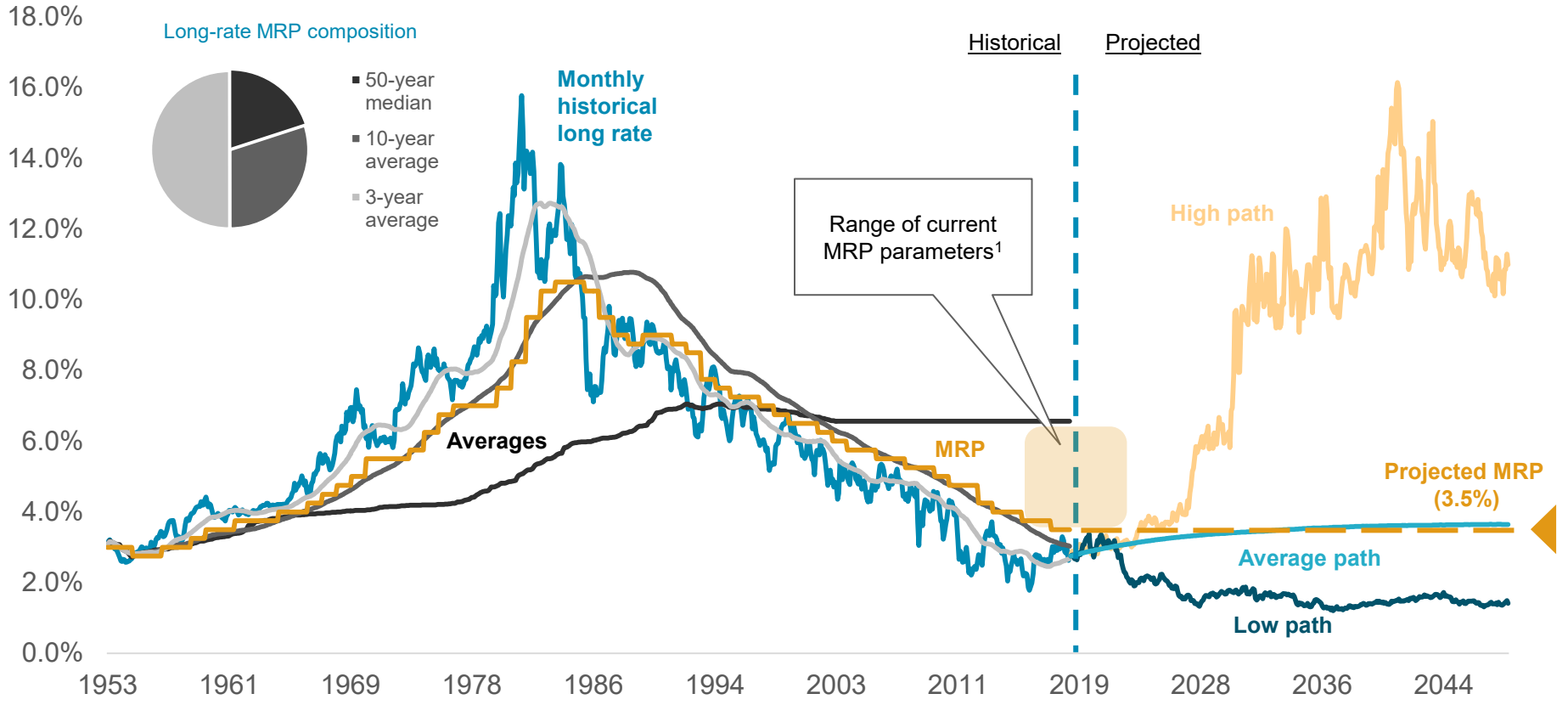
3 Changes to scenario generation (1 / 2)
New framework promotes greater consistency and comparability for market participants

Proposed changes	Details	Outcomes / implications
1 Use VM-20 generator for interest rates	• VM-20 scenario generator (ESG) and mean reversion parameter (MRP) are prescribed	• Interest rate scenarios are not prescribed under the current framework • Long-term interest assumption varied significantly between participants; prescribing an ESG and MRP promotes consistency across companies • The VM-20 MRP is informed by prevailing conditions and reacts to historical changes in interest rates
2 Use VM-20 generator for separate account returns	• VM-20 scenario generator is prescribed, using the same parameters as those used in VM-20 • Require separate account funds to be mapped to a combination of funds from VM-20 generator	
3 Allow proprietary ESG if and only if they do not materially reduce TAR	• Proprietary generator allowed if – and only if –TAR produced is not materially less than that produced using a prescribed generator	• Limiting use of other ESGs decreases risk of material reduction in reserves due to scenario differences
4 Introduce principles to govern implied volatility, with a prescribed “safe harbor” approach	• Projected implied volatility surface must be arbitrage-free • Relationships between implied volatility, realized volatility, and short-term asset performance should be consistent with historical data • Any realized “spread” between projected implied and realized volatility should not decrease the TAR	• Current framework does not provide adequate guidance on projecting implied volatility • New framework prevents inappropriate scenario generation from producing unrealizable hedge benefits in tail scenarios

3 Changes to scenario generation (2 / 2)

A wide variety of MRP levels are currently used; adopting the MRP calculation logic prescribed under VM-20 promotes consistency across companies

Historical and projected long (20-year) rate



1. Source: "Revisions to AG 43/VM-21 and C3 Phase II, VIAWG Proposal, May 31, 2018

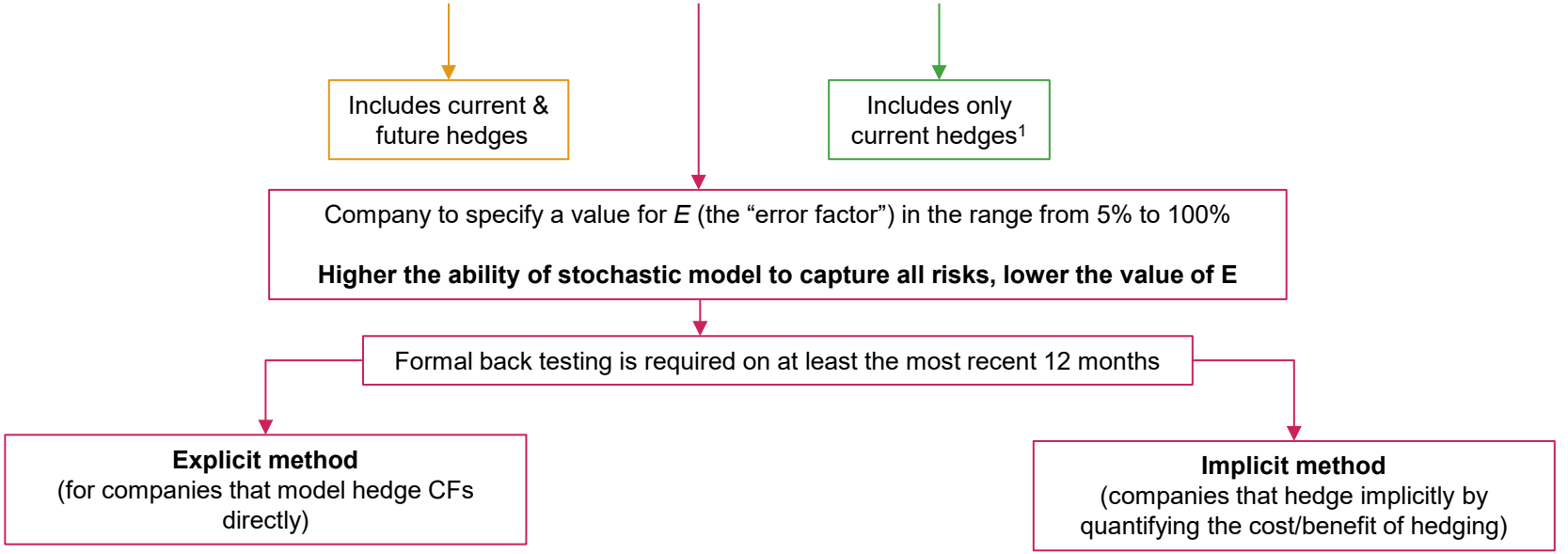
4 Changes to asset and liability projections (1 / 2)

Proposed changes		Details	Outcomes / implications
1	Follow VM-20 guidance on general account assets	• Net investment income on reinvestment assets and defaults on general account invested assets follow assumptions prescribed under VM-20	• Net reinvestment spreads are effectively capped at 50/50 A/AA
2	Permit simplified reflection of hedging	• Permit immediate liquidation of currently held hedge assets in the CTE (adjusted) run • Permit non-reflection of hedge accounting and unrealized hedge gains or losses in all projections	• Allowing hedge liquidation in the CTE (adjusted) run mitigates penalty on long-dated hedges
3	Reduce minimum CDHS “error factor,” but require back-testing to support chosen “error factor”	• Replace the current “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	• Allowing a lower “E” better aligns Statutory liability with economic, enabling fair value hedging • Avoids “double-counting” hedge ineffectiveness, as many insurers already reflect hedge ineffectiveness within the best-efforts run itself
4	Align conservatism margin for reflecting non-guaranteed revenue sharing income with historical experience	• Replace the current AG 43/VM-21 requirement for reducing a company’s best-estimate projection of non-guaranteed revenue sharing income in the CTE calculation • Multiples linearly grade from 100% of best-estimate in year 1 to 80% in years 5+	• New framework is more aligned with historical industry revenue sharing experience

4 Changes to asset and liability projections (2 / 2)

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

Stochastic Reserves = CTE(best efforts) + E x max[0, CTE70(adjusted) – CTE70 (best effort)]



- Replace stochastic scenarios used in calculating the CTE70 (best efforts) with a single scenario market path that actually manifested over the selected back-testing period
- Compare the projected hedge asset gains and losses against the actual hedge asset gains and losses
- To use a low value of E, projected hedge asset gains and losses to be within close range of 100% (e.g., 80% to 125%) of the actual hedge asset gains and losses

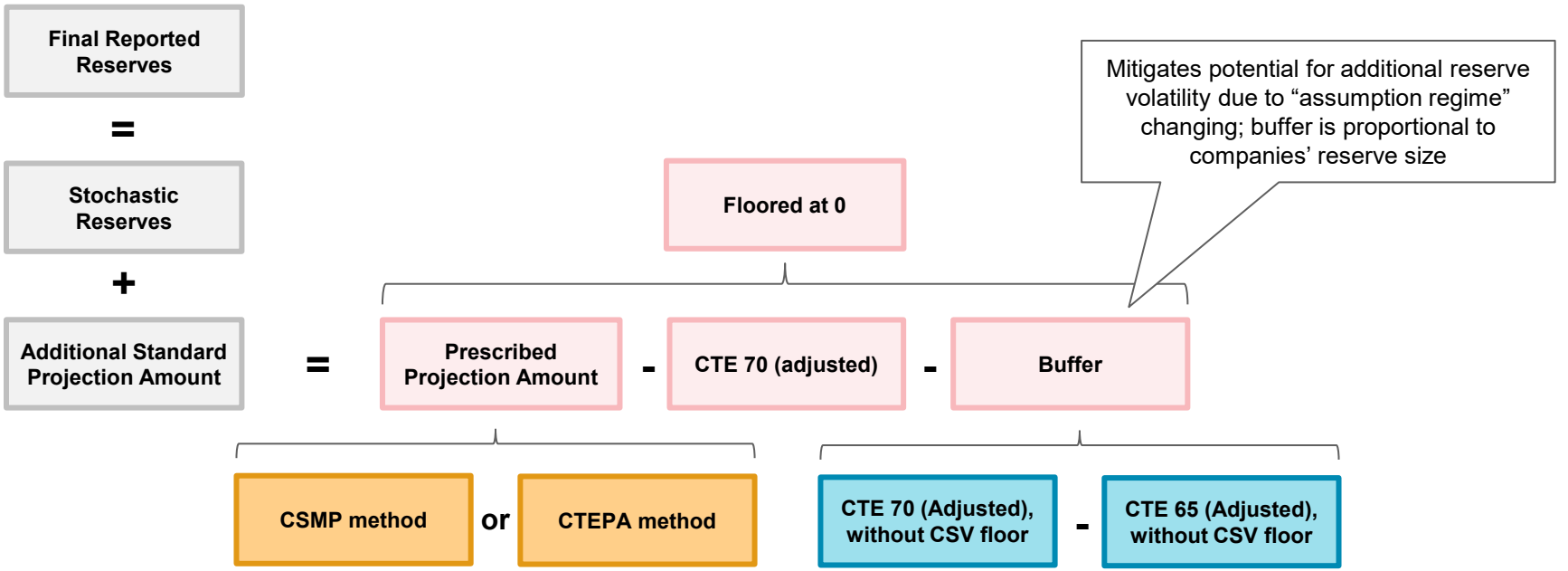
- Determine hedge asset gains and losses incurred over the month attributable to equity, interest rate, and implied volatility movements
- Determine the change in the fair value of the hedged item over the month attributable to equity, interest rate, and implied volatility movements
- Calculate Delta, Rho, and Vega coverage ratio based on above
- To use a low value of E, Delta, Rho, and Vega coverage ratio be within close range of 100% (e.g., 80% to 125%), consistently across the testing period

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

5 Align Standard Scenario calculations with CTE "adjusted"

Standard scenario was replaced with a new framework which aligns the calculation logic with the CTE adjusted run; Standard Projection assumptions were updated to align with industry experience

Standard Projection framework



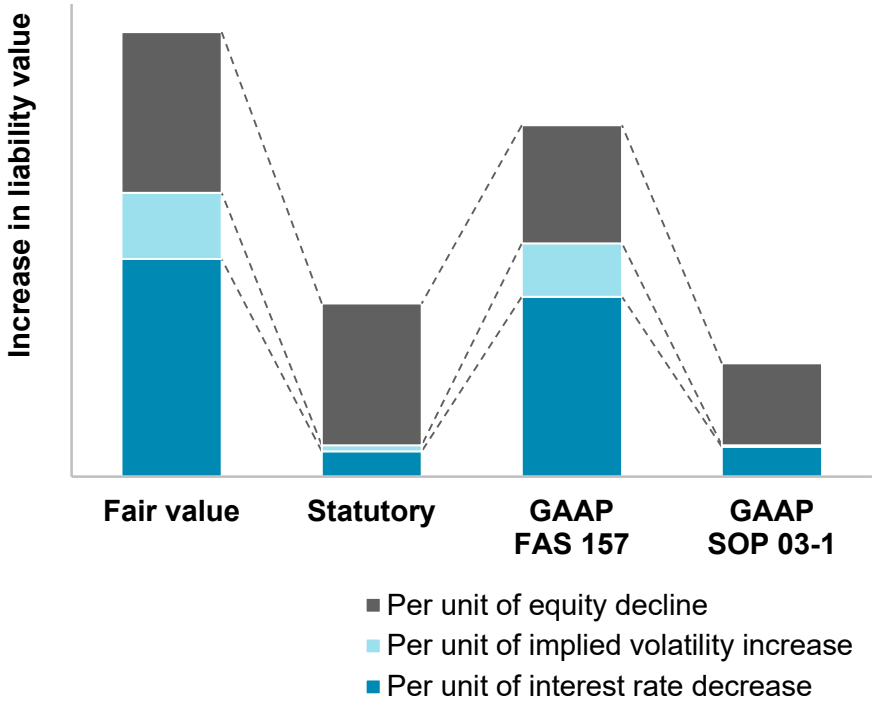
- Both the CSMP and CTEPA methods use prescribed assumptions calibrated to industry data
- CSMP method uses determinstic market paths, while CTEPA uses the same stochastic scenarios as the CTE 70 adjusted run; companies can elect either method

If assumptions are prudently managed, additional reserves are not required.

3 Asset liability management considerations

Existing accounting frameworks discourage comprehensive, fair value-based hedging – as a result of mismatched measurement bases

Typical VA market sensitivity, by valuation lens
Increase in liability value for different market shocks

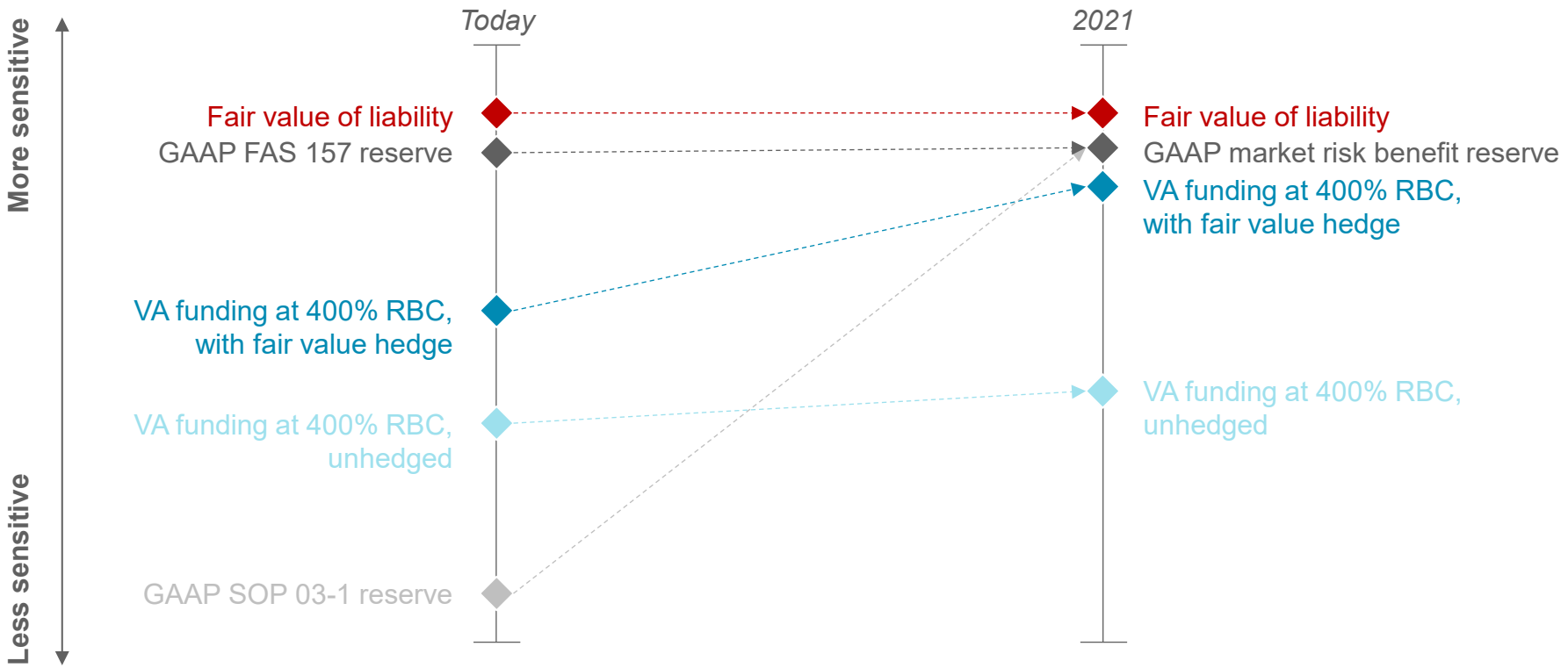


- Existing accounting frameworks treat derivatives – i.e., hedging instruments – in similar manners
- However, market sensitivity of the VA business differs markedly across valuation lenses
  - **Fair value**: reflects the greatest sensitivity
  - **GAAP FAS 157**: similar sensitivity as fair value
  - **Statutory**: generally less sensitivity, but exact levels change with guarantee in-the-moneyness
  - **GAAP SOP 03-1**: generally the least sensitive
- Even within an accounting framework, market sensitivity of the same liability may differ notably across companies
  - **Statutory**: no guidance for interest rates scenario generation, which drives interest rate sensitivity
  - **GAAP SOP 03-1**: divergent practices across industry in selecting equity mean reversion target and timeframe – which drives all market sensitivity

Under the current GAAP and statutory frameworks, insurers cannot hedge all valuation lenses effectively at the same time given their vastly different risk characteristics.

The concurrent NAIC and FASB reforms will encourage public companies to adopt more comprehensive fair value-based hedging programs

Market sensitivity of liability valuation
Across different valuation frameworks

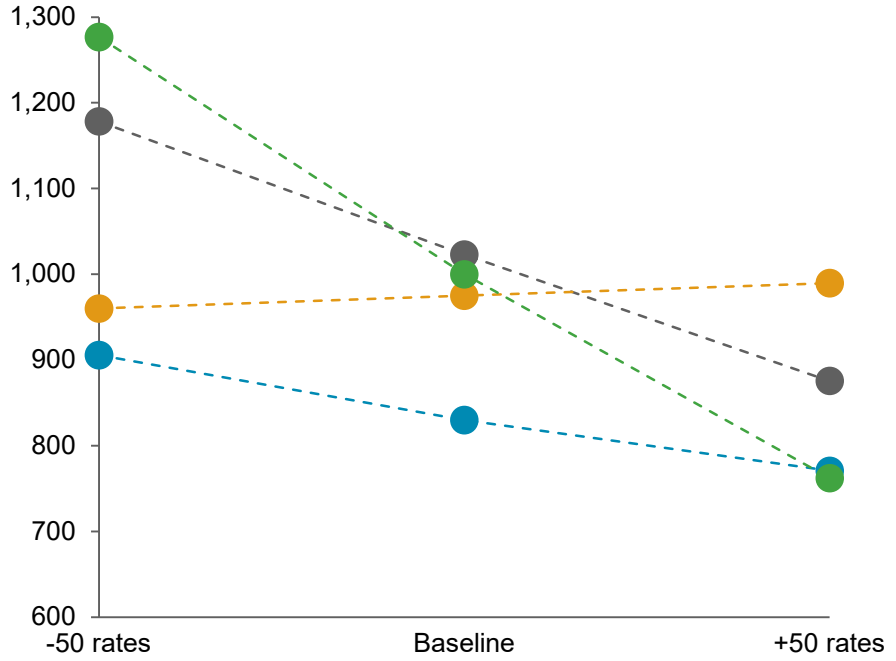


Current state: Difficult for insurers to hedge extensively on a fair value basis given divergence in market sensitivity across valuation lenses

After 2021: All lenses approach or accommodate fair value; companies need compelling strategic reason not to hedge on fair value basis

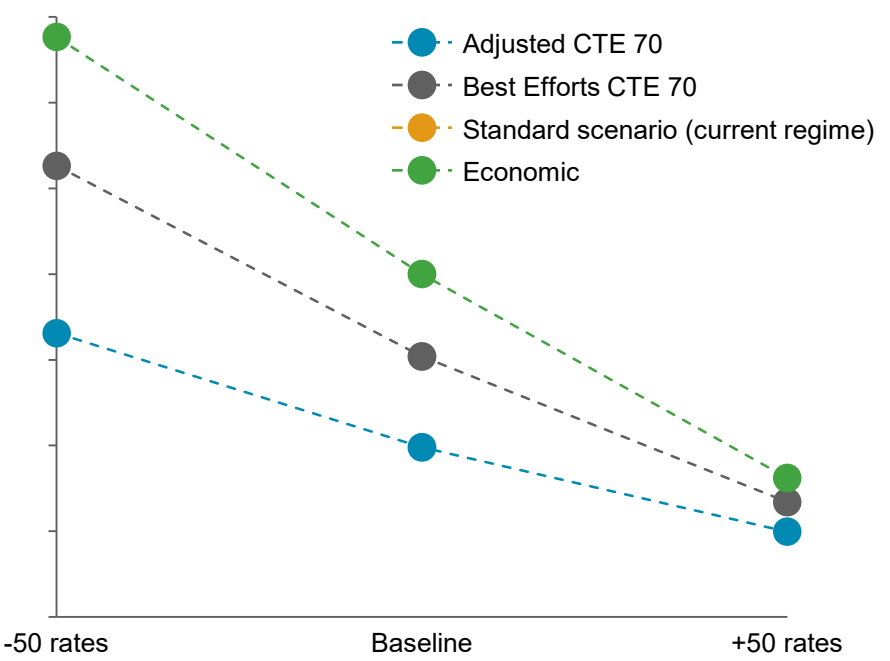
Removing the Standard Scenario floor and allowing companies to use a higher proportion of the Best Estimate run aligns the Statutory Reserve market sensitivity profile with the economic liability (hedge target)

Sample legacy block: interest rate sensitivities
Current regime



- The Standard Scenario does not have the same interest rate sensitivity profile as other bases due to valuation rates being locked in at issue; the Standard Scenario can dominate as interest rates increase, causing an ALM disconnect
- Best Estimate weight is capped at 70% under current regime even if modeling accuracy supports a higher weight; the adjusted run has minimal Rho exposure

Sample legacy block: interest rate sensitivities
Post-reform



- Removing the working reserve allows for more rate sensitivity in the Best Estimate reserve better aligning it with the economic profile
- The Best Efforts weight can be up to 95%, if supportable
- The changes better align the asset and liability sides of the Statutory balance sheet

4 Key takeaways

Key takeaways

1. Final draft of VM-21 was adopted at Summer NAIC meeting in August

2. Changes to Stochastic and Standard Projection calculations remove non-economic volatility, increase comparability across organizations, and enable fair value hedging; companies approve of changes

3. Calculation changes mostly leverage current state model functionality, but the Standard Projection requires significant new coding

4. Many companies will review hedge strategy as LDTI and VM-21 reform align GAAP/Statutory liabilities with fair value liability

Questions