



Illuminating the “Low Interest Rate Peril”—A Blueprint to Recalibrate the U.S. Life Insurance Reserve and Capital Framework Amid Global Low Interest Rates

By Aaron Sarfatti

Reserving standards for U.S. life insurers date to the 1941 enactment of the Standard Valuation Law (SVL). SVL introduced the Commissioner’s Reserve Valuation Method (CRVM), a formula to establish minimum reserves for life insurance policies. The introduction of CRVM was a manifestation of regulator desire to protect policyholders from life insurers not adequately reserving during a period of then historically low interest rates—rates driven by a world grappling

with the onset of World War II. The 1941 standard prescribed a maximum interest rate of 3.5 percent—a prudent cap considering the then effective 10-year Treasury yield of about 2.5 percent.

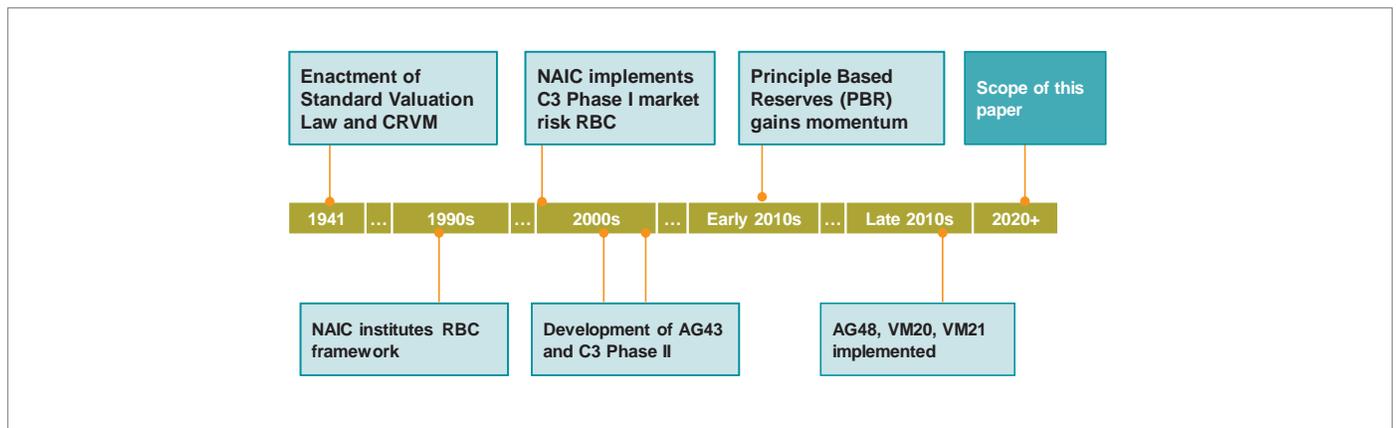
Nearly 80 years later and after decades of unpredictable interest rate fluctuations the 10-year Treasury yield now stands around 0.70 percent. Remarkably, despite extensive modernization of life insurer regulations, key reserving standards prescribe the same 3.5 percent for long-term interest rates. Risk-based capital (RBC) rules designed to safeguard further against interest rate fluctuations confoundingly prescribe an even higher interest rate target of 6.55 percent—a figure not updated since the year 2000.

Such radical disconnects from the reality of market interest rates distort the information value of an otherwise well-designed set of reserve and capital standards. The continuation of such distortions jeopardizes the credibility of all stakeholders in the system to protect policyholders.

The purpose of this article is two-fold:

- Signal a clarion call for the NAIC, state regulators, rating agencies and other stakeholders responsible for assuring the soundness of policyholder benefits to recalibrate reserve and capital standards for the reality of current interest rates; and
- propose a pragmatic “blueprint” for regulators and rating agencies to implement the necessary technical changes. (See Fig. 1)

Figure 1
Timeline of U.S. Life Insurance Reserve and Capital Regulations 1941–2020



A PRACTICAL BLUEPRINT FOR REGULATORY ENHANCEMENTS

Enhancements to life sector reserve and capital regulations to reflect market interest rates require both (i) technical enhancements and (ii) phased actions by regulators and rating agencies to integrate the technical enhancements. I outline a practical solution below.

Phase I Enhancement (Next 12 Months): Disclose Results Without Reversion-To-Mean Interest Rates

The first phase of reform should ensure the signal of financial strength reflects market interest rates. Such enhanced signals will ensure that both (i) a surplus reliant on reversion-to-mean stays within the entity and (ii) consumers and investors have a clear understanding of the balance sheet resilience of the entity.

The first step would be for companies to disclose the impact if existing mean reversion targets were replaced with prevailing long-term forward interest rate levels. This means replacing the current 3.5 percent and 6.55 percent mean reversion parameters for Valuation Manual (VM) 20 and 21 reserves and C3 Phase I RBC, respectively, with interest rates at approximately 1.5 percent to 2.0 percent. Such a fix will ensure stakeholders are aware of any company vulnerability to interest rates if they hold at market interest levels—at least for business subject to VM-20/VM-21 and C3 Phase 1. This fix can be implemented with a pair of keystroke entries in the economic scenario generator (ESG) tools and require no model or process changes by insurers.

This disclosure would supplement the existing printed reserve and capital levels while the NAIC selects a replacement ESG for VM-20/VM-21 and C3 Phase I, an initiative the NAIC wisely commenced last year in part to address the absence of sustained low interest rates in reserve and capital measures.

The second step is for the NAIC to establish standards for regulator use of the new disclosure and, in turn, for rating agencies to integrate the disclosure into ratings determinations. The NAIC should direct regulators to treat this information as supplemental, and to report impacts on reserves and capital so it can monitor any potential systemic concern. Regulators should scrutinize dividends reliant on mean reversion to prevent the most immediate adverse outcome—an insurer dividend of surplus that relies on interest rate mean reversion.

Rating agencies, by contrast, should use the information as a central estimate of reserves and capital adequacy in their ratings. Rating agencies have long bemoaned their reliance on opaque public financials—and the fix described above would improve the signal value of statutory financials. This approach signals immediately to customers and investors the condition of the balance sheet at market interest rates.

This approach balances the need for swift action to signal the true strength of insurer balance sheets at market interest rates while maintaining stability within the sector and affording time



Figure 2
Phase-out of Reversion-To-Mean Interest Rate Standards

	Description	Action	Rationale
Reform ESGs	Replace VM-20/VM-21 and C3 Phase I ESGs	NAIC continues effort to replace current ESGs	Ensures many reserves reflect potential for sustained low interest rates
Modernize NY7 AAT methodology	Alter mechanics of NY7 stress-and-recovery testing to embrace fair value concepts	Shorten time period for market stresses to occur	Allow current company ALM to mitigate a market stress 10-year stress period offers little actionable insight
		Post-stress: project all assets to return a spread to a fixed forward curve	Tests solely for asset adequacy post -stress
		Replace level scenario with “intrinsic value” test (all assets, including separate account, earn a flat spread over risk-free)	Identify entities with reserves reliant on well above risk-free asset appreciation Independent of hard-to-govern ALM assumptions
Harmonize AAT	Require passage of NY level scenario	All states adopt an “intrinsic value” test as an AAT minimum standard	Creates “bare minimum” consistency across states—using market interest rates Encourages robust interest rate risk management

for companies to recapitalize or alter asset/liability management (ALM) practices.

Phase II Enhancement (By 2025): Phase-out Reversion-To-Mean and Implement Minimum AAT and C3 Phase I Standards That use Market Interest Rates

The goals of reforms in the second phase should be to permanently remove reversion-to-mean interest rates—introducing measures that reward companies for prudent interest rate risk management. Figure 2 outlines three major steps of the phase-out.

The NAIC reform of ESGs appears well underway but, as shown in the subsequent section, pertains only to a portion of interest-sensitive liabilities.

A practical solution to ensure **all** reserves reflect the potential for interest rates to be sustained at current market levels will require reforms to asset adequacy testing (AAT). The recommended first step in AAT reform is to modernize the “New York 7” (NY7) methodology. The existing NY7 methodology is familiar to many state regulators, even if adopted into AAT requirements only by some. The technical changes to shorten and simplify the reflection of market stresses will better test company ALM strategies and increase regulator insight into the vulnerabilities of those strategies. These enhancements, in turn, will encourage other state regulators to adopt the NY7 methodology into the AAT minimum thresholds for their states.

... radical disconnects from the reality of market interest rates distort the information value of an otherwise well-designed set of reserve and capital standards.

Such a uniform adoption of minimum standards would satisfy the ultimate objective advanced by this article—statutory financials that consistently reflect interest rates if sustained at current market levels.

Subsequent sections present an overview and critique of how life insurance reserve and capital standards currently test for interest rate risk.

OVERVIEW OF CURRENT U.S. LIFE INSURANCE RESERVE AND CAPITAL STANDARDS

NAIC Model Law contains two layers of calculations to identify companies with inadequate reserves: the first are “primary” reserving standards tailored to individual classes of liabilities. The second layer consists of several “cash flow tests” to ensure the sufficiency of primary reserves to pay down liabilities against a variety of capital markets scenarios. This second layer governs the adequacy of both reserves and, in some instances, determines RBC for market risk.

Figure 3
Map of Major NAIC Model Reserve and Capital Standards

	Variable annuity (VA)	Variable Interest Sensitive Life (VISL)			Traditional			
		All other	Universal Life Secondary Guarantee (ULSG)	Variable ULSG	All other	Non-variable fixed	Fixed deferred	
Issue dates	All	2020+	Pre-2020	2007-12	2007+	All	2018+	Future
Primary Reserve	CTE70	VM 20 (3.5%)	CRVM ¹ Issue year: 2019 = 3.50%; 2010 = 4.25%; 2000 = 4.50%			VM 22 (2019=3%) ²	VM 23 (Future)	
Secondary Reserve	VM 21 (3.5%)	None	AG 38 (SVL rates)	AG 37 (SVL rates)	None			
RBC (C3)	CTE98	C3 Phase III (Future)			C3 Phase I (6.55%)			
AAT	Company-wide Asset Adequacy Testing (Interest rate test varies by state and discretion of appointed actuary)							

Interest rates used in reserve or capital levels (vs. current)

 Close to market	 Above market	 Well above market	 Standard in development
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1: Source: Willis Towers Watson, Prescribed U.S. Statutory and Tax Interest Rates for the Valuation of Life Insurance and Annuity Products, October 2019 (Annuity with cash settlement with interest rate guarantees of more than 20 years).
2: Source: NAIC 2019 VM-22 Class D Non-Jumbo rates.

Absent from the “map” of reserve and capital standards shown in Figure 3 is a reliable and comprehensive test of resilience to a sustained low interest rate (and, ultimately, sustained low asset appreciation) environment. The next sub-sections introduce the different classes of reserve and capital standards and assess their reliance on historical interest rates.

Primary Reserve Class I: Locked-in Interest Rates

The original CRVM and many successor reserving standards “lock-in” interest rates at levels dictated by the SVL and which reflect prevailing investment yields at the time of policy issuance. These reserve discount rates remain unchanged for the life of the policies, a feature that implicitly assumes the insurer has “matched” its liability cash flows with cash flows from fixed income investments. Such simplifying assumptions were necessary in an era that pre-dated modern computing, but nevertheless are vulnerable to companies that either (a) did not match assets and liabilities and/or (b) observed deviations in actuarial experience like mortality and surrender rates relative to the original expectations present in the fixed reserves.

Primary Reserve Class II: “Asset Sufficiency Tests”

The advent of both modern computing and the introduction of products with long-term guarantees motivated regulators to develop so-called principle-based reserves (PBR) that replace fixed, formulaic reserves with reserves with frequently updated

actuarial assumptions and stochastic market simulations. Notable examples are the NAIC adoption of VM-20 and VM-21 for permanent life insurance and variable annuity products with guarantees, respectively. Each standard requires insurers to project assets and liabilities over their lifetime against a set of capital markets scenarios—the most relevant factors being equity markets and interest rates. The amount of assets that satisfies the liabilities across the average of the worst 30 percent of scenarios, the conditional tail expectation (CTE 70), becomes the reserve.

Forebears of VM-20 and VM-21 granted appointed actuaries the discretion to determine the capital markets scenarios used in the stochastic projections, subject to a set of calibration criteria for select equity returns. Projected distributions of interest rates were not governed. Indeed, the lack of governance over interest rate distributions resulted in a large divergence in industry practices—with a strong skew toward above-market interest rate targets. Higher interest rates reduce the projected reserves for long-term guarantee products.

VM-20 and VM-21 now de facto prescribe all companies to use the scenario generator.

Secondary Reserve Class I: AAT via the New York 7 Scenarios

Secondary reserving standards test the sufficiency of the primary reserves to updated prudent estimate actuarial assumptions

across a range of capital markets environments. The primary purpose of these cash flow tests is to test sufficiency of the locked-in reserves whose values may be out-of-date and for companies that may not closely match assets and liabilities.

In 1986 the New York Department of Financial Services introduced seven deterministic scenarios required for entities licensed to sell policies to residents of New York. The seven scenarios consist of projected U.S. Treasury rates, credit spreads and equity market returns. Each scenario starts in prevailing market conditions, with stresses to these conditions unfolding over as many as 10 years. The scenarios test interest rates remaining at current levels as well as increases and decreases. Companies are not permitted to reflect any changes in ALM in response to the stresses, including the rebalancing of hedges.

Companies domiciled in New York are required to hold additional reserves if any of the scenarios produce a deficiency.¹ Companies outside New York usually test the NY7 scenarios as well—but hold additional reserves only if the appointed actuary determines the scenarios represent a “moderately adverse” scenario.

Risk-based Capital: C3 Phase I

The NAIC requires RBC to be held for similar mismatches between assets and liabilities. The tests generally align substantively with the aforementioned asset sufficiency tests. However, the capital markets scenarios differ and, as noted, use a mean reversion for interest rates of 6.55 percent.

The scope of the calculation includes payout annuities and traditional (non-indexed) fixed annuities and the assets backing those products. Regulators prescribe companies to hold RBC C3 should assets backing reserves not satisfy liabilities in a sufficient number of scenarios.

SHORTCOMINGS OF THE RESERVE AND CAPITAL STANDARDS—INTEREST RATES

The NAIC standards reflect generations of evolutions that addressed an industry whose products increasingly absorbed capital markets-sensitive risks. These evolutions have enabled NAIC Model Law to preserve the benefits of a book value framework within a regulatory world increasingly relying on market values.

However, the success of a book value standard requires frequent maintenance. Regulators must substitute market information with a prudent and realistic depiction of long-term eventualities for material risk factors. And at present the regulator depiction of eventualities for interest rates in U.S. insurance reserve and capital standards is neither prudent nor realistic.

While industry commentators debate other framework elements—longevity risk charges, more granular C1 credit risk charges, adoption of Current Expected Credit Loss

standards—inadequate attention is given to the assumptions that revert interest rates to 3.5 percent or 6.55 percent without testing the impact of interest rates sustained at present market levels. These “mean reversion” models project interest rate conditions sharply out-of-line with market interest rates. The interest rate risk measures are most in need of reform.

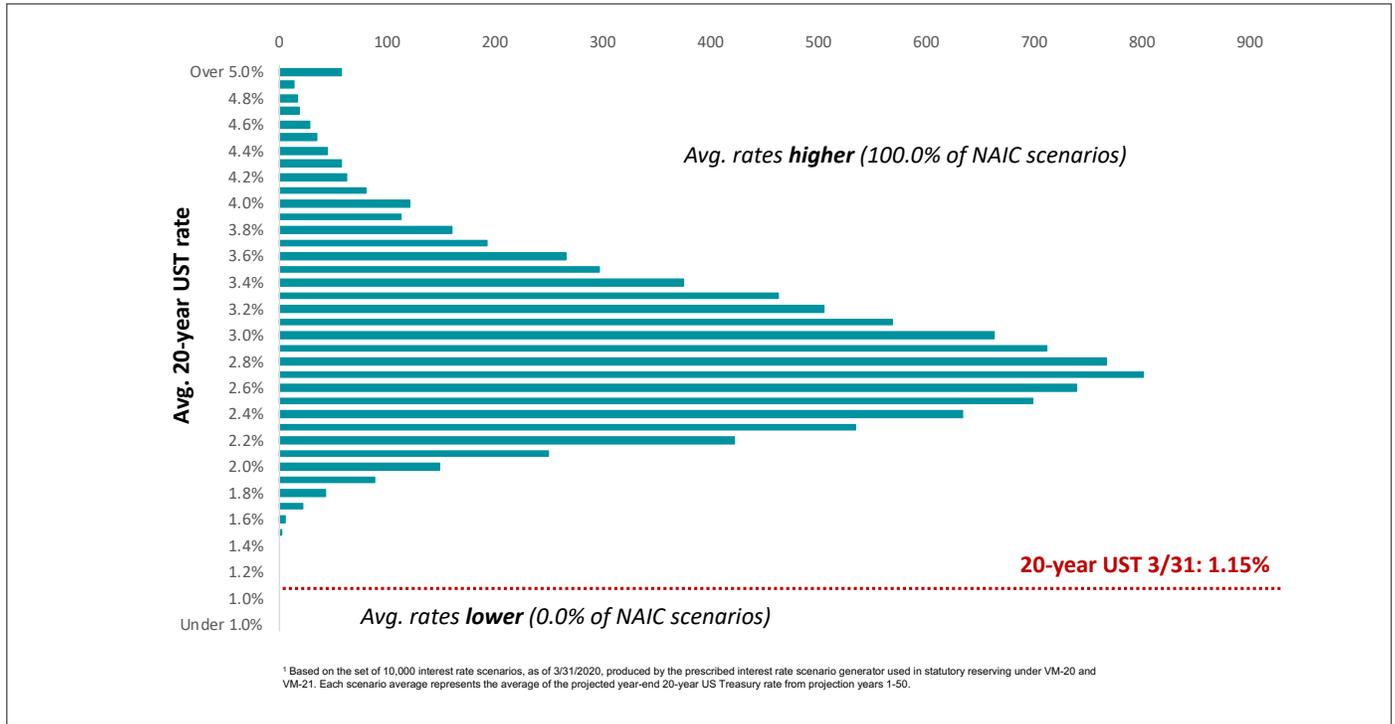
The next sub-sections demonstrate the shortcomings and/or impacts of the flawed interest rate model standards.

Shortcoming 1: Interest Rate Generators Fail to Project Sustained Low Interest Rates

The stochastic asset sufficiency test frameworks rely on ESGs to depict plausible realities for future capital markets to which, in turn, companies must reserve or capitalize. Each of VM-20, VM-21 and C3 Phase I rely on the same or similar ESGs. However, with mean reversion targets at 3.5 percent² and 6.55 percent for reserves and capital, the generators simply do not test whether company reserves can withstand interest rate conditions materially below these mean reversion targets. Figure 4 demonstrates the lack of sustained low interest rates



Figure 4
20-year UST Yields Based on March 31, 2020 VM-20/VM-21 Interest Rate Generator



within the distribution of the VM-20/VM-21 generator with the 3.5 percent mean reversion parameter.

The distribution shows no scenarios—out of 10,000—reproduce the level of the current forward interest rate curve (the curve companies can manage through markets). There is an implicit floor at approximately 2 percent for long-term rates—more than twice the current 10-year U.S. Treasury yield.

Many industry commentators take comfort that running stochastic scenarios ensures a wide range of plausible scenarios are covered. Figure 4 demonstrates the falsity of that comfort. Sustained low interest rate environments are omitted entirely from the asset sufficiency tests in the VM-20, VM-21 and C3 Phase I standards.

Shortcoming 2: Cash Flow Testing Standards are not Uniformly Enforced Across States

Cash flow testing for both reserves and C3 Phase I RBC standards broadly consist of two elements: stochastic asset sufficiency tests and deterministic projections usually along the NY7 scenarios. The thresholds for determining sufficiency of reserves or capital vary widely across states and even across companies within certain states.

A recent industry survey highlighted that approximately two-thirds of companies considered the New York level interest rate

scenario—the closest test of sustained interest rates at current levels—to be “beyond moderately adverse,” indicating the company did not require its passage before certifying its AAT reserve level.

The lack of standards harmonization means regulators and rating agencies receive inconsistent signals regarding the ability of company reserves to support current market interest rates.

Shortcoming 3: NY7 Scenarios Require Modernization to Enhance Efficacy

The NY7 scenarios differ from the stochastic asset sufficiency tests in two ways:

- Each scenario deterministically projects interest rates according to a simple set of rules starting at prevailing market interest rates; and
- strict rules are enforced regarding any investment or hedge rebalancing.

Strengths of the NY7 scenarios are their simplicity and anchoring to current interest rates—if and when regulators enforce them and rating agencies utilize them in ratings determinations.

Shortcomings of the NY7 scenario approach are two-fold. The first pertains to the restriction around the rebalancing of investments and hedges. Many companies rebalance hedges or

investments around a duration gap target. Guarantees on the liabilities require such rebalancing because they are convex—the amount of projected funds needed to satisfy guarantees does not move proportionally with changes in interest rates. The NY7 scenarios do not permit rebalancing. However, the stresses to interest rates unfold over many years. This misalignment means that companies are unable to reflect rebalancing and reinvestment actions in response to changes in interest rates.

The second shortcoming pertains to the projection of interest rates. Scenarios all utilize the spot curve rather than changes to the forward curve. This means scenarios like the level scenario, which holds the spot curve constant over time, results in effectively permanently declining interest rates during an upward-sloping interest rate environment (and vice versa). Redefining the central scenario to follow the forward curve best reflects the ability of insurers to use markets to manage their interest rate exposure.

CONCLUSION

The NAIC and state regulators deserve praise for the modernization of many aspects of the life insurance reserve and capital standards. However, the decline in market interest rates coupled with antiquated reversion-to-mean assumptions undermine the otherwise valuable signals the framework provides about the financial condition of insurance operating entities.

How many insurers will be affected by the elimination of interest rate mean reversion? Our inability to answer this question is precisely why reforms are necessary.

The two-phase proposal to eradicate interest rate reversion-to-mean is intended as a blueprint upon which to wean the industry off one of its most longstanding and (to date) costly exposures—to declines in long-term interest rates—and ensure the life insurance regulatory and ratings system maintains its goal of accurately measuring financial health and promoting sound risk management practices. ■



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ENDNOTES

- 1 Recently, the NY Department of Financial Services has exempted companies from holding reserves for two of the seven scenarios.
- 2 The 3.5 percent is based on an NAIC-prescribed trailing average of historical interest rates. The NAIC formula converges mean reversion targets to market interest rates over time; however, should interest rates remain at current market levels the targets would not converge to market rates until approximately 2035.



VM-31: Modifications and Findings for 2020 Reports

By Angela McShane, Ben Slutsker and Rachel Hemphill

This calendar year introduces many changes for life insurance companies. In addition to the emerging developments related to the pandemic and the economic environment, 2020 is the first year that all U.S. life insurance companies will be required to comply with VM-20 for life insurance products and the recent significant revisions to VM-21 for variable annuity products. This article focuses on the VM-31 principle-based reserve (PBR) Actuarial Reports associated with these new requirements. In particular, it summarizes new modifications for 2020 year-end reporting disclosure requirements for life

insurance, variable annuities (VA), and differences between the two. It then concludes with a description of initial findings from 2019 year-end VM-31 PBR Actuarial Reports and future considerations.

KEY CHANGES TO VM-31 FOR LIFE INSURANCE

As more companies adopt VM-20 and file Life PBR Actuarial Reports, regulators have observed gaps and inconsistencies in reporting across the industry. As a result, PBR reporting requirements for life products have expanded significantly in 2020. While some changes are non-substantive, others require companies to include additional documentation and disclosures over what was included in 2019 reports.

Major updates include new required Excel templates, assumption tables for each material risk, and a new section for riders and additional benefits. In addition, some VM-20 valuation updates have new associated VM-31 disclosures, such as a new Deterministic Exclusion Test (DET) Certification Method disclosure requirement. Figure 1 outlines key new life reporting requirements added to the 2020 Valuation Manual (VM).



Figure 1

New Life Reporting Requirements Added to the 2020 VM

VM-31 Section	Requirement
2. General Requirements	<ul style="list-style-type: none"> Report must be in the format of a searchable PDF, but can include any charts, graphs or spreadsheet attachments.
3.B. Executive Summary	<ul style="list-style-type: none"> Required template for summarizing all policies covered by VM-20 Summary of results for current and prior year, net and gross of reinsurance
3.C. Life Summary	<ul style="list-style-type: none"> Any significant unresolved issues with principle-based valuation Statement indicating governance documentation is available upon request
3.D. Life Report	
3.D.1. Assumptions and Margins	<ul style="list-style-type: none"> Complete assumption tables in Excel format for each material risk Required template with details on experience studies for each risk factor
3.D.2. Cash-Flow Models	<ul style="list-style-type: none"> Additional details on model vendor, version, customization, process outside of model and model validation
3.D.3. Mortality	<ul style="list-style-type: none"> Additional justification for aggregating mortality experience (if applicable) Additional disclosure of post-level term mortality assumptions and details on credibility/improvement
3.D.4. Policyholder Behavior	<ul style="list-style-type: none"> Description of testing performed to determine size and direction of margins Seriatim post-level term testing, including how anti-selection is reflected
3.D.5. Expenses	<ul style="list-style-type: none"> Treatment of commissions and acquisition expenses
3.D.8. Reinsurance	<ul style="list-style-type: none"> Relationship with reinsurers (affiliated/non-affiliated, captive/non-captive, etc.)
3.D.10. Exclusion Tests	<ul style="list-style-type: none"> Results of each component of Stochastic Exclusion Ratio Test (if applicable) Support for DET Certification Method (if applicable)
3.D.11. Additional Information	<ul style="list-style-type: none"> Additional details for sensitivity tests and simplifications Statements regarding which calculations were performed as of the valuation date, or as of a date preceding the valuation date Breakdown of universal life with secondary guarantee (ULSG) reserve results into variable, indexed, and regular universal life (UL) Description of how PIMR balance is derived and allocated among model segments
3.D.12. Riders and Supplemental Benefits	<ul style="list-style-type: none"> Description of coverage provided, separate premium or charge, how valued, and where the reserve is recorded
3.D.14. Certifications	<ul style="list-style-type: none"> Additional certification from qualified actuary for DET Certification Method

KEY CHANGES TO VM-31 FOR VARIABLE ANNUITIES

The 2020 VM contains significant changes to VA disclosures. Although some companies have implemented these changes for 2019 year-end, most companies will be reporting the new disclosures for the first time at 2020 year-end.

Structure

In Actuarial Guideline 43 (AG 43) and early versions of VM-21, documentation requirements were interspersed throughout the regulation. Aside from a few larger documentation sections, VM-21 also contained instances of a single disclosure hidden among other valuation requirements. In the 2020 VM, all VA reporting items are consolidated in VM-31, primarily the VA summary and VA report, with some high-level results in the executive summary. In addition, VA reporting now has a required standard outline to facilitate report development and review.

Updated Sections

Prior reporting requirements were often presented in outline form, which have now been updated with more detail.

For hedging, there are now additional reporting items on back-testing, including documentation on the error factor and CDHS. Documentation is required if the company elects the safe harbor and to justify if the CTE70 (best efforts) is below both the CTE70 (adjusted) and the fair value. For scenarios, documentation on calibration was replaced with documentation that the use of non-prescribed generators does not reduce the total asset requirement (TAR) compared to the prescribed generator. Documentation was added for scenario reduction techniques, proxy funds not within scope of the prescribed economic scenario generator (ESG), and implied volatility. Asset disclosures are now located in separate sections for general and separate accounts, and more details are required for reinsurance

agreements. In addition, certifications are now part of the report rather than separate submissions.

Sections Added and Removed

There are new sections that reflect updates to the valuation requirements, most notably the additional standard projection amount and its two calculation methods—CTE with prescribed assumptions (CTEPA) and company-specific market paths (CSMP). These include disclosures for cumulative decrement analyses and the Withdrawal Delay Cohort Method. There is a section to report the details of the phase-in, if applicable.

Other sections cover prior items that were relevant but not always explicitly disclosed: materiality, material risks, allocating reserves to individual contracts, and contract loans. Exhibit LR027 in risk-based capital (RBC) reporting may optionally be included and the standard scenario section was removed, along with the statement that the actuary is not opining on the adequacy of surplus or the future financial condition. In lieu of the prior sensitivity testing section, some individual sections discuss sensitivity testing (e.g., utilization) although others do not (e.g., lapse).

The NAIC Life RBC Working Group also recently modified instructions for the phase-in and smoothing for 2020 LR027 C-3 RBC calculations, to avoid a reduction to the TAR due to voluntary reserves that had been held in prior years but are no longer held.

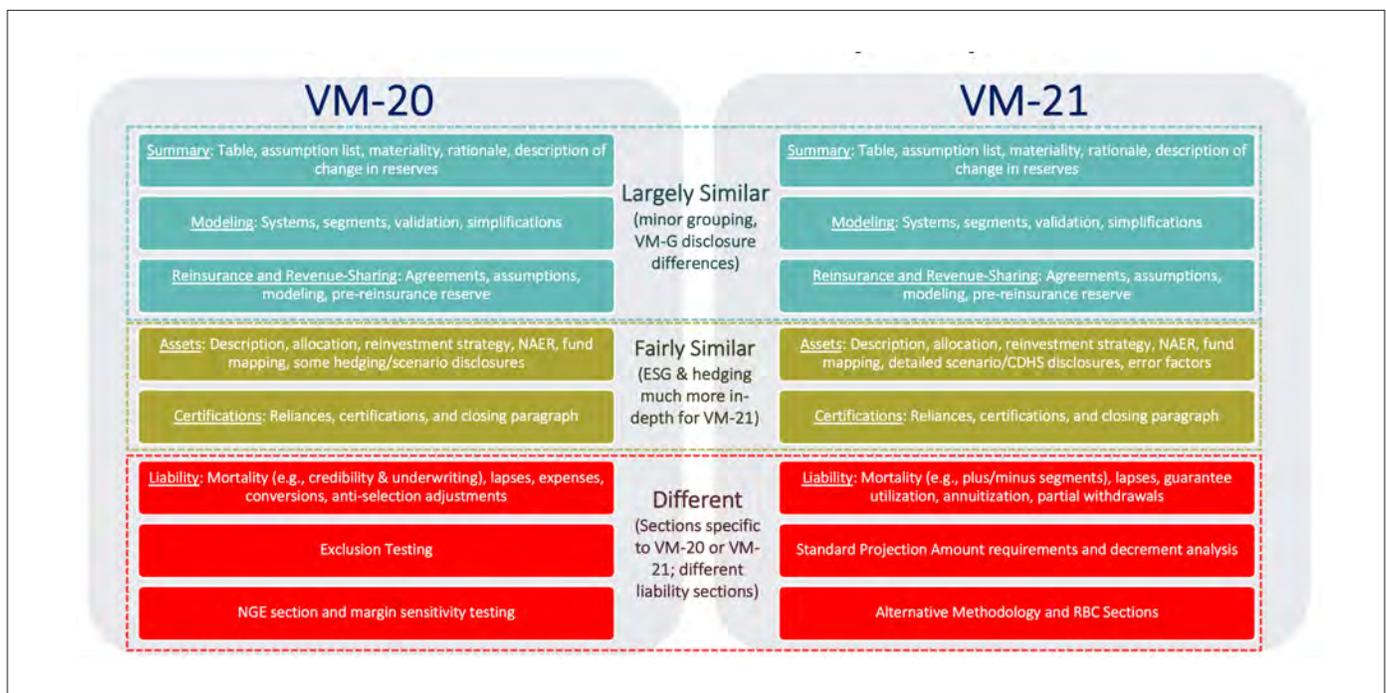
Figure 2
VM-20 vs. VM-21 Disclosure Requirements

COMPARISON BETWEEN VM-20 AND VM-21

The updates to the VM-21 documentation requirements not only significantly modify the prior requirements, but also more closely align the VM-21 requirements with the required VM-20 disclosures. A company writing both life and VA business would find it beneficial to leverage one VM-31 report when developing the other. Given that aspects of the requirements are identical, it may even appear inconsistent or strange for the two disclosures to look uncoordinated. For companies with siloed life and VA teams, it is recommended that the two coordinate leading up to the first report submission.

Figure 2 compares VM-20 and VM-21 disclosures across different attributes (using the 2020 VM). First off, the two share the VM-31 executive summary, which must be completed for all policies valued under both VM-20 and VM-21. There also are similar requirements for listing out assumptions and providing an overview.

Even the asset sections are very similar between VM-20 and VM-21; VM-21 contains the VM-20 asset requirements plus additional requirements related to hedging and scenario generation. Certifications in VM-20 and VM-21 are nearly identical, except that VM-20 also has additional certifications related to exclusion tests. Where life and VA requirements clearly differ are in a few sections specific to each framework’s methodology: exclusion testing and NGEs for VM-20, additional standard projection amount, alternative methodology, RBC, and annuitizations/partial withdrawals/utilizations for VM-21.



INITIAL 2019 FINDINGS AND FUTURE CONSIDERATIONS

Life

Companies implementing PBR could still benefit from reviewing an analysis of the 2017 and 2018 PBR reports that was conducted by the NAIC’s valuation analysis working group (VAWG), and which is available under “Related Documents” on the NAIC’s VAWG website. While companies that filed their second or third VM-31 report in 2019 incorporated follow-up requests from prior years, many of the new adopters had issues consistent with those cited in the VAWG report. Most of the observed issues relate to the VM-20 calculations rather than the VM-31 reporting requirements including, for example, using Bühlmann credibility for simplified issue business, not applying the starting asset collar correctly, or not updating to the 2015 CIA lapse table for ULSG policies.

While the 2020 VM reflected a significant number of amendments, there has been a marked slowdown in amendments for the 2021 VM, recently reinforced by industry and regulator focus on COVID-19 related efforts. One project that the industry and regulators have been jointly pursuing is non-guaranteed yearly renewable term (YRT) field testing to inform a permanent approach to handling non-guaranteed YRT in PBR, which could replace the current approach of requiring the unearned tabular cost of insurance (i.e., $\frac{1}{2}C_x$) pursuant to statement of statutory accounting principles (SSAP) No. 61. It was previously acknowledged that this project had an ambitious timeline, and with the industry and regulators now focused on COVID-19 related efforts, potential amendments are expected to now target implementation in the 2022 VM.

Variable Annuities

The NAIC’s VAWG will be reviewing the 2019 early adopters of the new VA framework, which is likely to result in public guidance to companies, similar to that previously provided for life PBR. Systematic issues may be included in a public report, and individual issues will be discussed directly with companies. Early findings reveal some systematic reporting issues, including:

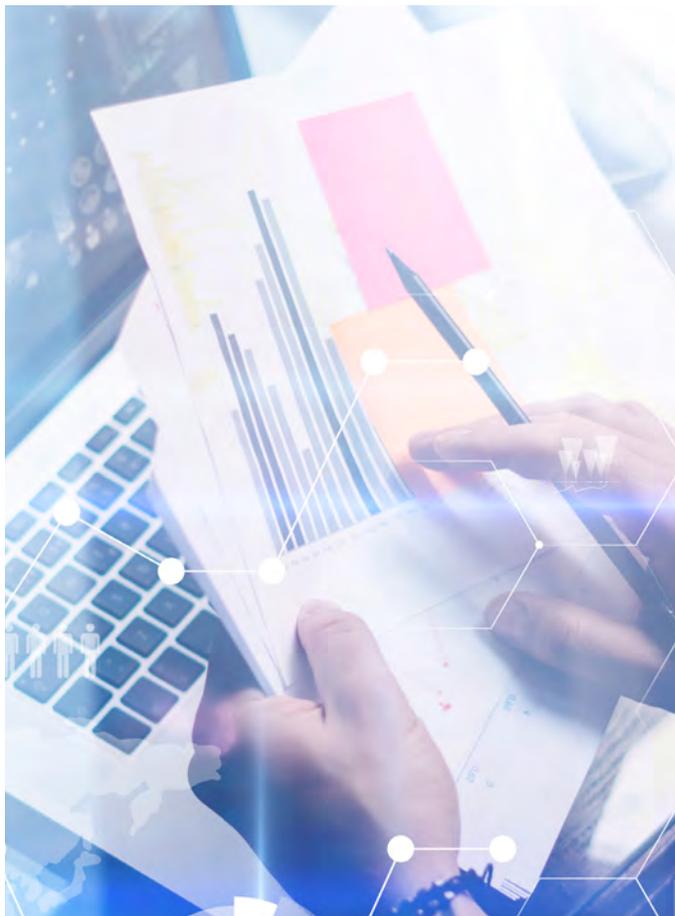
- Insufficient documentation for items previously only maintained “on file,” such as CDHS;
- vague materiality discussions;
- inefficient reporting, including repetitive sections that could be made more succinct through the use of tables, or the inclusion of tables within the PDF report which are better suited for Excel attachments;
- providing actual-to-expected (A/E) ratios with “E” only on a prudent basis and not also an anticipated experience basis; and

- lack of support indicating why the number of scenarios that were run is sufficient, especially for a reliable conditional tail expectation at the 98th percentile (CTE98).

ADVICE FOR FUTURE VM-31 REPORTS

Initial VM-31 report submissions have tended to be brief and sometimes do not expand upon certain aspects of the valuation method, process or business. However, showing less may lead to more questions, and more work to ensure regulators are comfortable with the company’s PBR reporting. Don’t be afraid to provide more information in order to help regulators understand and get comfortable with the methods, assumptions and results. Providing more information up front will in turn save time and effort in responding to questions and requests for additional information after the fact. It is recommended to think about how companies got comfortable with their PBR reserves and put that forward in the VM-31 report.

In addition, don’t write PBR reports in a vacuum. There are several documentation requirements already in place (and future requirements on the horizon). Leverage work done for asset adequacy testing, own solvency risk assessment (ORSA), GAAP unlocking, corporate governance frameworks, and even the new long duration targeted improvement (LDTI) disclosures. While



the format of VM-31 is specified, much of the content may have already been created for other purposes and can be leveraged.

Finally, focus on continual improvement. There is an expectation that these reports won't be perfect the first time—but it is suggested to focus efforts each year to improve upon the prior year's report. This does not necessarily mean just appending new information; it also means removing information that is confusing, not relevant, or could be shown in a better format. While many worry about the length of the document, it may be beneficial to instead focus on completeness and clarity in conveying whether reserves are appropriate and reflect relevant risks under the statutory accounting requirements.

The views expressed in this article are solely the views of Angela McShane, Benjamin Slutsker and Rachel Hemphill and do not necessarily represent the views of their respective firms. The information presented has not been verified for accuracy or completeness and should not be construed as legal, tax or accounting advice. Readers should seek the advice of their own professional advisors when evaluating the information. ■



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Retrospective Assumption Monitoring: GAAP Long-Duration Targeted Improvements

By Steve Malerich

Editor's note: The views expressed in this article are those of the author and do not necessarily reflect the views of the author's firm.

In 1987, Statement of Financial Accounting Standards No. 97 brought retrospective assumption updates to accounting for universal life (UL) contracts. Since then, insurers have struggled with questions of when to change assumptions and how to explain the effect of a change. Accounting Standards Update (ASU) 2018-12 eliminates retrospective updating of the deferred acquisition cost asset but adds it to reserving for traditional nonparticipating (TL) contracts.

Part of the difficulty stems from effects that are unique to the retrospective update method. Unlike other methods, retrospective updating requires recalculation of net premiums for actual experience as well as for changes to projection assumptions. As a result, actual cash flows change the reserve even when assumptions aren't changed. Furthermore, the effects of such updates are opposite the effects of changing assumptions—adverse experience reduces the reserve and favorable experience increases it. When experience trends better or worse than expected, the adjustments accumulate. Eventually, an assumption change reverses the accumulated adjustments.

This article describes the use of a new tool that is tailored to the specific challenges of this valuation method.¹ As an addition to the actuarial toolkit, this can help insurers and their auditors monitor the significance of actual claim experience to reported reserves and can establish a baseline from which to anticipate or evaluate the effect of an assumption change.

A NEW TOOL

This tool depends only on three amounts drawn from actual valuation models. From the current model, it needs the appropriate reserve ratio (UL benefit ratio or TL net premium ratio, both represented here by b) and the present value of future revenue (TL gross premiums or UL assessments). It also needs the ratio (b_0) from the first model to use current assumptions.

$$(b - b_0) \times PV(\text{Revenue})$$

[This tool is a supplement, not a substitute for statistical tools used in evaluating the credibility of new data or for any of the disclosures required by ASU 2018-12.]

Why Add a New Tool?

The simplicity of this formula and its dependence only on output from actual valuation models make it convenient for filling gaps left by other tools.

When actual experience differs from expected, traditional measures give no indication of how far retrospective adjustments have moved a reserve away from its expected levels or that there even is any drift away from those levels. This tool reveals just how much reserves are distorted by the accumulation of actual experience since the last assumption update.



Evaluations of mortality and morbidity assumptions typically start with a baseline of zero. The presumption (null hypothesis) is that current assumptions are good until proven otherwise. Statistical measures evaluate the credibility of new data and significance in relation to the null hypothesis. They say nothing, however, about the credibility of the data underlying the current assumption or its relevance to the product. And they are slow to identify all but extreme trends away from expected. By measuring the cumulative effect of experience variances, this tool may identify a need for change sooner than statistical measures alone.

When contemplating a possible assumption change or explaining an actual change, a baseline of zero provides no help. This tool provides a useful baseline.

Who Benefits?

Valuation actuaries can easily identify where experience variances have significantly altered reserves. Monitoring its growth can help to distinguish random variances from trends. It won't say how to change an assumption, but it can help to identify when a change is needed.

Executives can see how much actual experience has altered reported reserves. And the tool offers them a first rough estimate of how much an assumption change might affect the reserve. Since it can be summed across products, it can be seen at any level that they consider important.

Auditors benefit in the same ways as valuation actuaries and might use the information to look most closely where the effect of variances is most significant.

Ultimately, financial statement users will benefit if this helps companies produce more timely assumption updates or helps them better explain those updates.

When and How to Use it

During annual assumption review, a large result from this tool could call into question the relevance of the data underlying the existing assumption or the technique used to extrapolate from that data. A persistent positive or negative result could do the same even if the absolute amount is not large. Either might suggest that something is causing experience to differ from what's behind the current assumption. It may, therefore, signal

that some sort of change is needed even if new experience alone cannot yet support an entirely new assumption.

For assumption changes, this tool gives a first estimate of the remeasurement gain or loss. For this purpose, however, it is too crude to stand on its own. By understanding both the tool and the business, an actuary can adjust the estimate to better anticipate the result of a change or to help explain a change. (See below under "Limitations—And What to do With Them.")

HOW IT WORKS

Reserve Drift

A net premium reserve for contracts currently in force can be expressed in present values:

$$PV(Benefits) - b \times PV(Revenue)$$

Here, only the ratio (b) depends on actual experience. Changes in the ratio will be driven mostly by claim variances; the effect of persistency variances will usually be small. If it weren't for changes in the ratio since the last assumption update, the reserve would be:

$$PV(Benefits) - b_0 \times PV(Revenue)$$

It takes little effort to see that the new tool equals the difference between these two formulas.

Baseline Assumption Change Estimate

As an assumption change estimate, this tool expects future claims to vary from the current assumption by the same percent of revenue as past claims.² Though crude, this will usually be better than not having an estimate at all.

Understanding the tool and how it relates to cohort characteristics will enable an actuary to further refine the estimate. (See below under "Limitations—And What to do With Them.")

Example

To illustrate the tool, let's begin with the projection of a new cohort shown in Figure 1. (The net premium ratio is in the lower right corner.) For ease of illustration, assume no terminations and a zero percent discount rate.

Figure 1
Projection of a New Cohort

Year	1	2	3	4	5	6	7	8	9	10	Total
Premium	100	100	100	100	100	100	100	100	100	100	1,000
Benefit	25	35	45	55	65	75	85	95	105	115	700
Reserve	45	80	105	120	125	120	105	80	45	-	70%

If actual benefits are higher than expected each year, true-ups will increase the net premium ratio and defer a piece of each variance in proportion to the remaining lifetime premium. The cumulative true-up will increase for new deferrals and decrease for amortization of prior deferrals.

Figure 2
Variance and True-Up by Year

Year	1	2	3	4	Unlock
Variance	10	10	10	10	60
Prem Ratio	71%	72%	73%	74%	80%
True Up	-9	-8	-7	-6	
Cumulative	-9	-16	-21	-24	24
Reserve	36	64	84	96	120

In practice, the originally expected reserve is generally not available for direct comparison to the reported reserve. But if we remember the original net premium ratio, we can use it with current information to calculate the cumulative true-up. Looking at year four in Figure 2, the difference between the current and original net premium ratios (4 percent) times the present value of expected future premiums (600) gives the accumulated difference between actual and expected reserves (24).

Now consider an assumption change at the beginning of year five that increases expected future claims by the same 10 percent of premium as experienced in the first four years. With six years left, that’s an increase of 60 in the present value of future claims. With 40 percent of expected lifetime premiums already passed, 40 percent of this increase is added immediately to the reserve. And 40 percent of 60 equals 24.

In this example, because the change increases expected claims by the same percentage of premium as actual claim variances, the effect of unlocking precisely reverses the cumulative true-up and the updated reserve increases to its originally expected level.

LIMITATIONS—AND WHAT TO DO WITH THEM

Whether evaluating accumulated reserve drift or estimating the effect of an assumption change, this tool is limited. Understanding its limitations, however, can enhance its value.

When one of the following is identified as relevant to a product, an actuary can adjust expectations. Except for persistency, the results of the tool will still measure the cumulative effect of past variances on the current reserve. These adjustments can be used to improve the estimated effect of an assumption change.

Persistency Variances

The tool won’t measure the cumulative effect of persistency variances or estimate the effect of a change in a persistency assumption.

For lapse supported products, persistency variances can significantly alter the net premium or benefit ratio. Further analysis may be needed to assess the relative significance of claim and persistency variances.

New Cohorts

For new cohorts, extrapolating may overstate the ultimate cost difference. In this situation, an actuary might expect the effect of an assumption change to be less than indicated by this tool.

Late Emerging Trends

Sometimes, experience will track well with original assumptions or assumption changes will realign the assumption with actual experience. In either case, claims may diverge from a current assumption several years into the life of a cohort. In this situation, the tool is likely to underestimate the effect of an assumption change, perhaps greatly. It could, therefore, be especially important to monitor the trend in this metric as well as its absolute level. Even a small but persistent or growing result can signal the need for an assumption change.

Increasing Revenue

For products with an increasing revenue pattern, extrapolating on revenue will magnify the estimate of ultimate claim costs. This may be especially significant to new cohorts, where extrapolation from select experience variances may already overstate the likely ultimate costs. In extreme cases, the results of an actual assumption update may be closer to zero than to this result.

Decreasing Revenue

If revenues are expected to decrease for reasons other than contract termination (including decreases to zero on limited-payment contracts) then extrapolating on revenue will tend to underestimate ultimate claim costs. How much it underestimates will depend in part on how soon or fast revenues are expected to decline.

This tool reveals just how much reserves are distorted by the accumulation of actual experience since the last assumption update.

Very Small Cohorts

For segments of business with few expected claims in any given period, proportionately large claim variances are common. An extrapolation based on revenue can still be a reasonable starting point, but an actuary may need to look closely at actual experience to determine whether the extrapolation is likely to over or under estimate future variances and adjust expectations accordingly.

CONCLUSIONS

Challenges with retrospective accounting for universal life contracts over the past 30 years will soon affect traditional nonparticipating contracts, as well.

With the simple tool discussed in this article, the actuary can fill gaps in existing tools. Monitoring it regularly will help a company and its auditors evaluate the strength of reserve estimates and explain the results of assumption changes. ■



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ENDNOTE

- 1 The tool itself was introduced in two earlier articles, "Traditional Contract Analytics" by Malerich, Scotchie and Winawer, *The Financial Reporter*, December 2018, and "Universal Life Contract Analytics" by Malerich and Tsai, *The Financial Reporter*, December 2019.
- 2 Space limitations do not allow me to show the derivation of the new tool as an assumption change estimate. To get a copy of the derivation, contact the author.



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