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

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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.

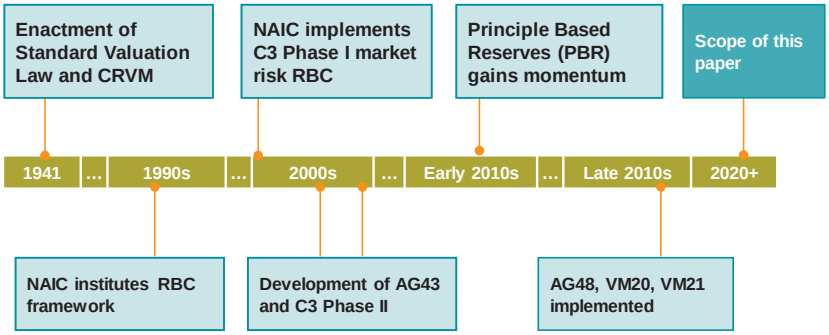
Nearly 80 years later and after decades of unpredictable interest rate fluctuations the 10-year Treasury yield now stands around 0.70 percent. Remarkably, despite extensive modernization of life insurer regulations, key reserving standards prescribe the same 3.5 percent for long-term interest rates. 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.

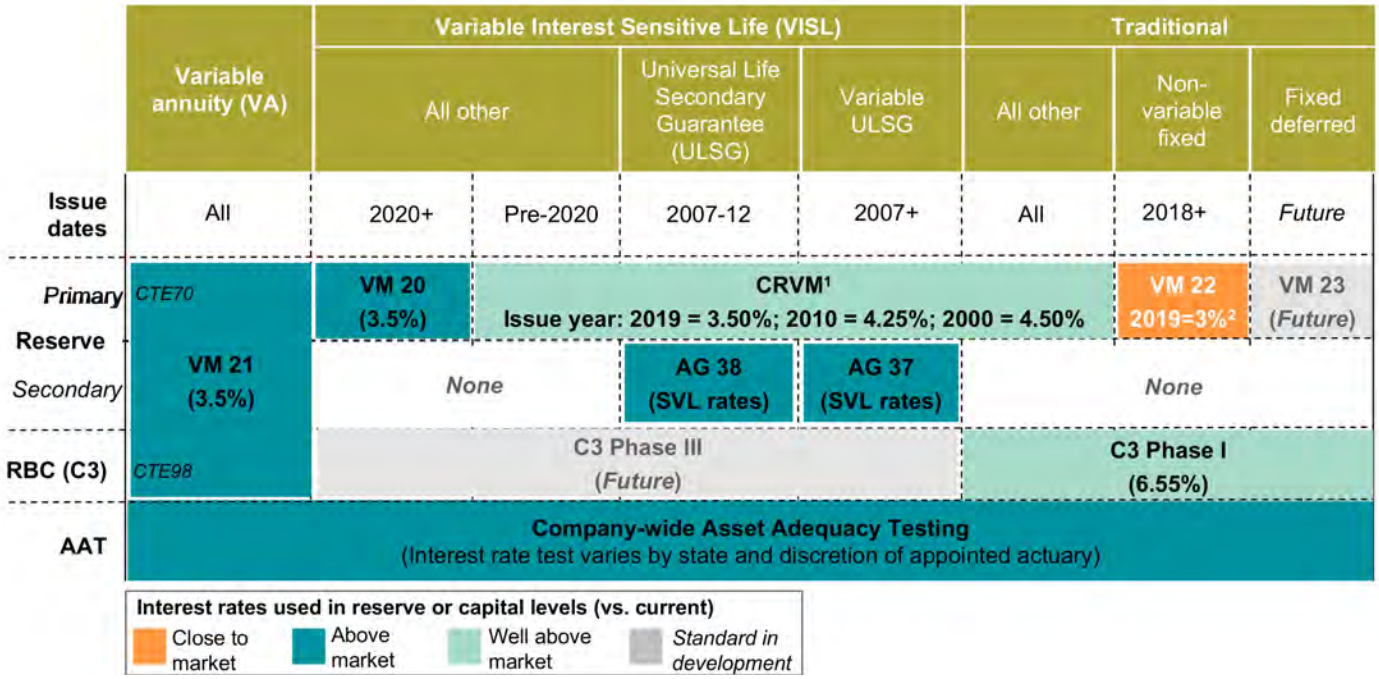
Such a uniform adoption of minimum standards would satisfy the ultimate objective advanced by this article—statutory financials that consistently reflect interest rates if sustained at current market levels.

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



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.

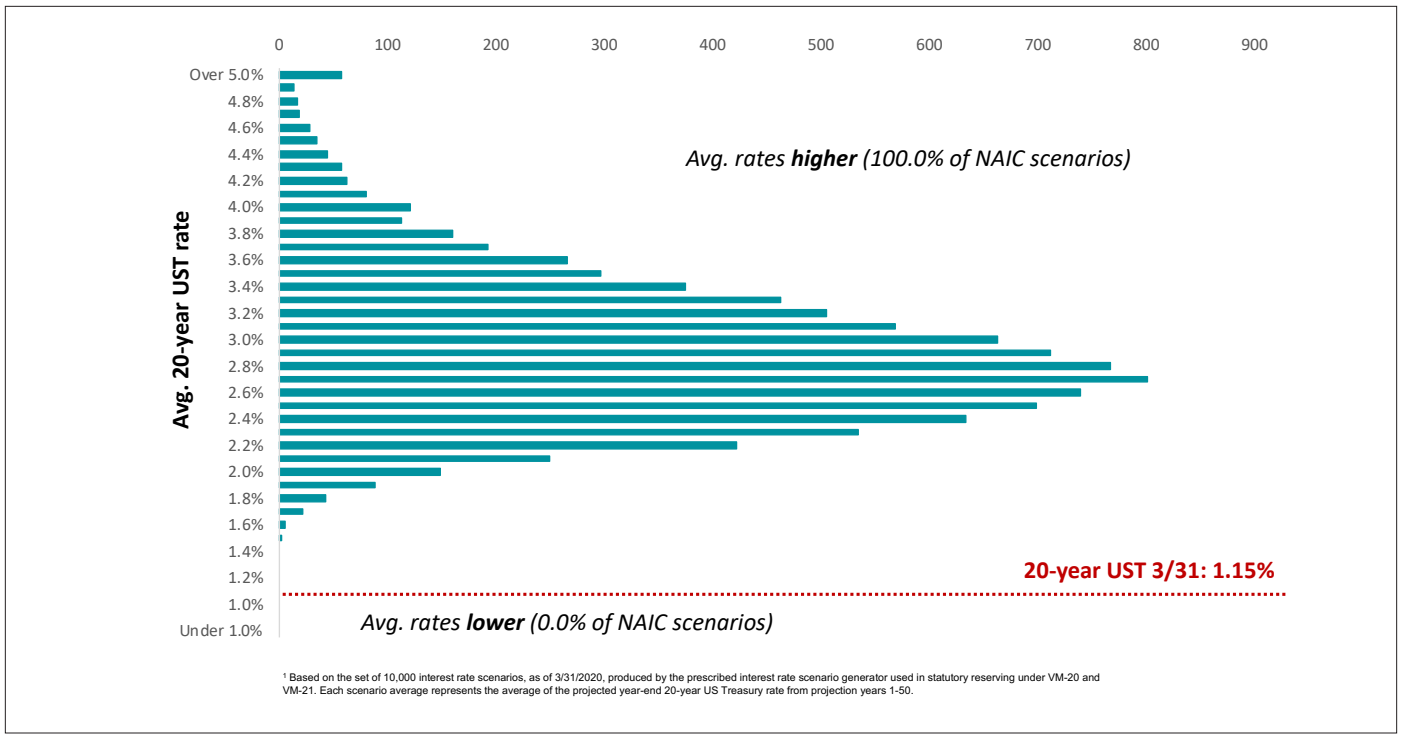
While industry commentators debate other framework elements—longevity risk charges, more granular C1 credit risk charges, adoption of Current Expected Credit Loss standards—inadequate attention is given to the assumptions that revert interest rates to 3.5 percent or 6.55 percent without testing the impact 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 percent[2] 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.