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Exploring RILA and VA synergies through integrated hedging and risk management

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As the registered index-linked annuity (RILA) market continues to evolve, variable annuity (VA) writers should be poised to recognize the potential risk management synergies stemming from adding RILAs to existing VA block portfolios. In particular, there are offsetting sensitivities to equity returns for VA and RILA. Recent industry and regulatory trends motivate a review of how these synergies can play out in managing a hedge program and on the statutory balance sheet.

Executive Summary

For variable annuity writers, the integration of registered index-linked annuities (RILAs) into existing VA portfolios presents possibilities for risk management synergies. In particular, the complementary nature of offsetting equity risk exposures and hedging requirements between traditional VA (referred to in this paper as VA) and RILA create the possibility of value-adding hedge strategies that differ from how one would hedge the products on a separate stand-alone basis.

The RILA market continues to exhibit expansion, driven by a variety of product features and increasing sales volumes, with notable increases of over 10% in 2023 and 2024 and industry forecasts suggesting there is still a runway for sustained growth. RILAs offer various crediting strategies designed to deliver growth potential while providing downside protection, thereby attracting investors.

RILAs are commonly hedged statically using a basket of options. While static hedging offers predictable costs and straightforward implementation, it poses challenges related to managing collateral requirements, transaction costs, and equity volatility premiums, especially during market downturns. Combining VA and RILA hedging strategies can reduce transaction costs and help with collateral management. By internally offsetting the put options required for hedging VA guarantees with those sold for RILA crediting obligations, insurers can manage equity risk more efficiently, potentially enhancing portfolio yields and reducing overall hedging costs.

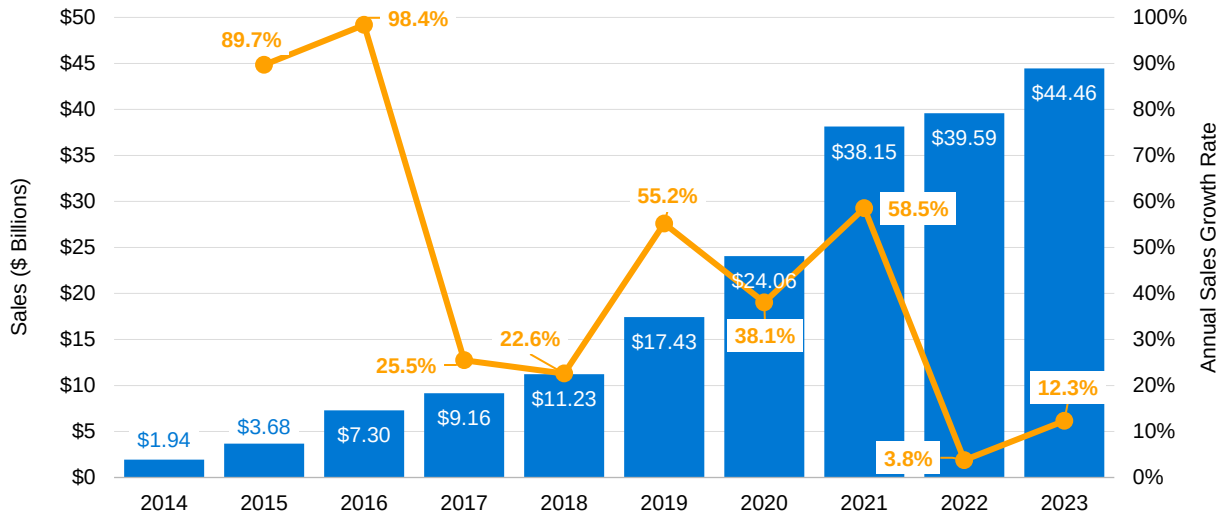
Additionally, some insurers may choose to hedge less market risk and instead hold additional capital against downside risk from the products. The U.S. statutory capital framework is a natural framework for analyzing trade-offs associated with the use of hedging versus capital to fund claims. In particular, the principle-based framework naturally captures diversification benefits present between the products, and how contingent they can be on factors like the RILA/VA sales ratio and product characteristics.

This paper demonstrates how intentional management of the RILA and VA together offers benefits that can improve the operational costs associated with the hedge program, unlocked only through strategic integration and prudent risk management with a holistic hedge strategy. Additionally, the paper delves into consideration of company-specific trade-offs within the U.S. statutory framework between use of hedging and capital.

Background

RILAs have shown significant growth in recent years and are projected to continue this trend. In 2023, RILA sales reached $44.46 billion, which was an over 10% increase from the previous year and marked a new all-time high for this product line. This upward trend is expected to persist, with LIMRA documenting RILA sales above $65 billion in 2024 and strong sales again in 2025.

FIGURE 1: RILA SALES BY YEAR



Source: LIMRA.

RILAs often use underlying indices such as the S&P 500, MSCI EAFE, MSCI EEM, Russell 2000, NASDAQ-100, and Dow Jones Industrial Average, offering diverse market exposure. The use of customized multi-asset volatility control indices is also on the rise.

RILAs offer various crediting strategies that appeal to investors seeking growth potential with some downside protection. These strategies include cap and participation rates for the upside, as well as buffers and floors for downside protection, and can vary in length of time. The table in Figure 2 shows common RILA crediting strategies:

FIGURE 2: RILA CREDITING STRATEGIES

CREDITING STRATEGY	DESCRIPTION
Upside: Cap Rate	Credits interest up to a maximum limit (cap), paired with buffers or floors to limit losses.
Upside: Participation Rate	Credits a percentage of the index's return, often combined with downside protection features like buffers or floors.
Downside: Buffer Strategy	Absorbs a certain proportion of losses (e.g., a 10% buffer means the insurer absorbs the first 10% of losses).
Downside: Floor Strategy	Provides a guaranteed minimum return or limits the loss to a certain percentage.

As the competition increases in the RILA space, new crediting strategies are emerging over the years. The "vanilla" crediting strategy remains a point-to-point approach that tracks the index return over a specified time with the strategy features described above. The emerging crediting strategies tend to enhance the upside potential, strengthen the downside potential, or lock in performance gains more frequently.

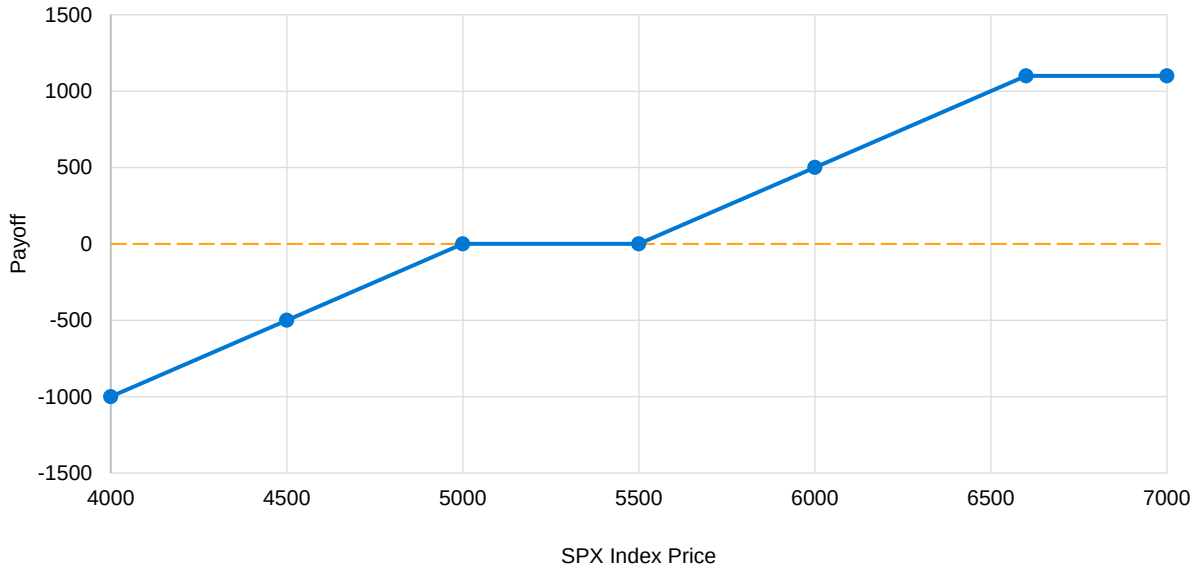
RILA HEDGING STRATEGIES

Most RILA carriers use static hedging strategies for the risk management of RILAs. This involves purchasing option packages designed to match the specific payoff profile of the RILA segment offerings. These options are typically held to maturity. The most common instruments used in static hedging are over-the-counter (OTC) options and flexible exchange (FLEX) options.[1] Consequently, the static hedging strategy can be beneficial for its ease of implementation and its ability to maintain a predictable cost of hedging. For a vanilla point-to-point RILA product with cap and buffer on the S&P 500 index (SPX), the company typically needs to buy a call spread and short a put to a dealer. The most common approach involves:

- Long SPX ATM-120% call spread: Buy an at-the-money (ATM) call option and sell a call option at 120% of the current SPX level to cap the upside.
- Short SPX 90% strike put: Sell a put option at 90% of the current SPX level to provide downside protection (buffer) and offset the cost of the call spread.

The chart in Figure 3 represents the payoff for the RILA hedge positions. This shows how the strategy caps the gains and buffers against the losses.

FIGURE 3: HEDGING STRATEGY PAYOFF



However, static hedging comes with some drawbacks. Transaction costs and volatility premiums can be significant, especially for longer-dated products. Long-dated options, such as those used for hedging six-year RILA products, tend to have higher volatility premiums for several reasons. The market for long-dated options typically has much lower liquidity compared to short-term options, resulting in wider bid-ask spreads. Additionally, the longer timeframe increases the volatility risk premium, as sellers demand more compensation for holding risk over an extended period.

Collateral requirements and liquidity concerns associated with short puts or put spreads on the downside can pose challenges. For example, during the COVID-19 market crash, the S&P 500 (SPX) tumbled over 30%, causing short puts to become in-the-money. This situation forced RILA carriers to post substantial collateral to meet margin requirements, straining liquidity resources. Maintaining sufficient collateral can have a significant impact on a company's asset allocation strategy. To meet margin requirements, especially during periods of market stress, companies must hold a substantial portion of their portfolios in liquid, low-yielding assets like cash or high-quality

1. OTC options are bilateral, customizable contracts traded privately between parties, while FLEX options are customizable but traded on exchanges with centralized clearing.

government bonds. This necessity to maintain liquidity for potential collateral calls can limit a firm's ability to invest in higher-yielding, less liquid assets, such as private credit, collateralized loan obligations (CLOs), or other alternative investments that insurers often utilize to enhance yields.

These factors can impact the overall cost of the hedging strategy, adding constraints on the company's asset allocation and potentially dragging portfolio yields.

Benefits of hedging equity exposures from VA and RILA together

For VA writers, the hedging strategy primarily involves managing the risks associated with Guaranteed Minimum Benefits (GMxB), such as a Guaranteed Minimum Income Benefit (GMIB) or a Guaranteed Lifetime Withdrawal Benefit (GLWB). These guarantees can be thought of as embedded put options that the insurer has sold to policyholders. To hedge the equity risk of these guarantees, VA writers need to replicate put options to manage the downside risk.

Because RILA and VA hedging strategies can involve, respectively, short and long put option positions, synergies can be achieved by neutralizing the hedging exposure through an “internal trade,” where the RILA segment "sells" the put to the VA segment. This approach not only reduces transaction costs and avoids paying volatility premiums for option transactions, but also leads to more efficient collateral management. With more efficient collateral management, insurers gain the flexibility to allocate a portion of the asset portfolio to less liquid, higher-yielding assets, potentially enhancing overall portfolio yields.

To further demonstrate the potential benefits of integrating hedging strategies for RILA and VA, first consider a sample analysis of a $1 billion account value VA block. This illustration examines the Greek profiles for the VA block along with the corresponding RILA policies and explores hedging solutions that capture synergies between RILA and VA hedging via reduced transaction costs, improved collateral risk management, and enhanced asset yield. Figure 4 presents the assumed Greeks for the risk-neutral (RN) VA GLWB rider liability.

FIGURE 4: ASSUMED GREEKS FOR RISK-NEUTRAL VA GLWB RIDER LIABILITY

GREEK	DESCRIPTION	VALUE ($ THOUSANDS)
Delta	Change in RN value per 1% increase in equity	(1,117)
Gamma	Change in Delta per 1% increase in equity	27
Rho	Change in RN value per 1 basis point rate increase	(260)
Vega	Change in RN value per 1% change in volatility	1,080

It is common for VA writers to utilize equity futures and options to hedge the liability Delta, Gamma, and/or Vega exposure. Equity futures can be effective components of a core hedge strategy that provide Delta coverage, while options also provide coverage for Gamma and Vega in addition to Delta. Consider SPX put options with maturities of 2 to 7 years, with strike prices typically ranging from ATM to 30% out-of-the-money (OTM). These options are chosen based on their Greek profiles while managing hedging costs. ATM options provide the strongest Gamma and Vega coverage, offering robust protection against market declines. However, they come with higher premiums, which can substantially increase hedging expenses. In contrast, OTM options, such as 20% or 30% OTM puts, offer a more cost-efficient alternative.

Considering the hedge budget and the Greek profiles of the VA liability, the six-year 20% OTM put option stands out as a reasonable choice. It offers a cost-effective solution with a lower premium compared to ATM or less OTM options, while still providing meaningful protection against significant market downturns.

To hedge the equity risk of the VA block, the sample hedging strategy includes purchasing six-year 20% OTM SPX put options and trading S&P E-mini futures for residual delta mismatch.

- Long 31,500 units[2] (approximately $176 million hedge notional and cost of $13.3 million) of 20% OTM put options on SPX
- Short 288 S&P E-mini futures to hedge the remaining delta

This approach provides a balanced hedge by efficiently managing key risk exposures. Delta and Vega risks are effectively neutralized, and Gamma is partially offset. The Greeks for this hedge portfolio are shown in Figure 5.

FIGURE 5: GREEKS FOR HEDGE PORTFOLIO

RISK EXPOSURE (IN THOUSANDS $)	VA LIABILITY	OTM PUT	FUTURES	NET
Delta	1,117	(309)	(809)	-
Gamma	(27)	8	-	(19)
Vega	(1,080)	1,079	-	(1.8)

With this example, the VA writer is purchasing $176 million notional in SPX put options from the OTC market. Due to the volatility risk premium and limited liquidity in long-dated options, the bid-ask spread on these six-year puts can reach up to 1% of the notional amount. Additionally, there are other potential costs to consider, such as the expense of rolling the options as they near expiration and initial margin requirements if the company falls under the Uncleared Margin Rules (UMR).[3]

Next, we consider a case where the same carrier, with $1 billion of VA exposure, has also sold a six-year RILA with a 0% floor tied to the SPX. For illustrative purposes, we assume the carrier's sales total $176 million in RILA account value—equaling the notional amount needed on the VA put option. Instead of separately purchasing OTC put options for the VA block and shorting put options to fund the ATM call for the RILA block, the carrier can internally "sell" the put options for its VA exposure to offset the risk. This internal risk offset can significantly reduce overall hedging costs. In this combined strategy, the carrier only needs to purchase ATM calls for the RILA segment in the OTC market, eliminating the need to trade puts externally for both the VA and RILA blocks. As a result, the bid-ask spread—which can be as high as 1% of the notional amount for the six-year option—is effectively saved, translating to up to 8 basis points (bps) of savings per annum (p.a.) for the RILA block and 1.5 bps in cost savings for the VA block.[4] Furthermore, RILA carriers could also consider dynamically hedging the ATM call options instead of purchasing long-dated options. Given the significant volatility premium associated with long-dated options, a dynamic hedging strategy could offer cost advantages.

In addition to reducing transaction costs, this combined hedging approach also provides significant benefits in terms of collateral and liquidity management. By hedging VA and RILA together, the carrier can reduce its overall collateral requirements. The short put exposure from the RILA segment offsets the VA's need for put protection, enabling the carrier to manage collateral more efficiently. This improved collateral management allows the insurer to maintain a more flexible asset allocation, with higher allocations to alternative investments that enhance portfolio yields while still meeting liquidity needs.

2. As is customary in derivative trading, one unit represents a notional level equaling to the S&P 500 index. This illustration assumes a June 30, 2024, valuation date.
3. UMR was phased in from 2016 through 2022 and require financial counterparties to post initial and variation margin for non-centrally cleared derivatives, aimed at mitigating systemic risk and promoting market stability.
4. For the RILA, the 8 basis points assumes that half of the 1% bid-ask is spread over the six-year term, i.e., (100 / 2) / 6 = 8.33 basis points. The same nominal amount of savings would apply to the VA, which has an account value (AV) of $1 billion, so, as a proportion of AV, the savings equals 8.33 x (176 million / 1 billion) = 1.45 basis points.

FIGURE 6: RILA COLLATERAL SCENARIO ANALYSIS

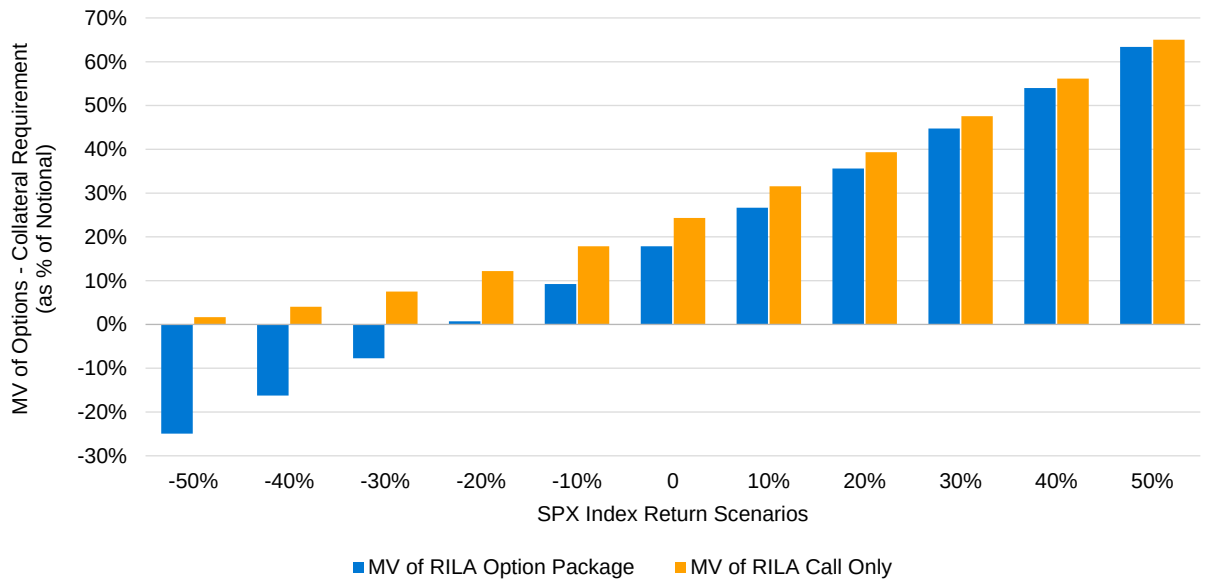


Figure 6 shows the collateral requirements under different SPX index return scenarios, comparing the RILA option package (short put and long call) and the combined approach with ATM call only. These scenarios assume a six-month holding period with SPX returns ranging from -50% to +50%.

For a typical RILA hedge, when the SPX index declines beyond 20%, the short put becomes in-the-money, resulting in a significant need to post collateral to the counterparty. In extreme cases, such as a 50% drop in the SPX index, the carrier could face collateral requirements exceeding 25% of the RILA account value. This means, to meet these collateral calls, that the carrier would need to maintain a substantial portion of its assets in highly liquid investments, such as cash or government bonds, or set up repo facilities to borrow against corporate bonds and other eligible assets to raise cash, albeit at some cost.

In contrast, the combined VA + RILA hedging strategy using ATM calls avoids these challenges, facilitating reallocation to more illiquid, higher-yielding assets. As an illustration, the combined RILA and VA strategy could allow the carrier to reallocate at least 20% of highly liquid assets held for potential collateral needs for RILA-only exposure to similarly rated, but less liquid assets, with potential yield pick-ups that could exceed 100 basis points. This reallocation would translate to an improvement of more than 20 bps in the overall asset portfolio yield.

Despite the benefits of transaction cost savings and yield pick-up from reduced need for collateral-eligible assets, there are drawbacks to consider. First, within the RILA hedge strategy, shorting the put can be seen as partial funding for purchasing the ATM call. When combined with VA, the short put is no longer a source of funding, but the premium cost outflow for the ATM call remains. In practice, to maximize the amount available to invest in higher-yielding assets, one would dynamically replicate the ATM call instead of purchasing it in the market. However, this would naturally introduce additional complexity and trade-offs in the hedge program.

Further, there are other potential challenges from combining the VA and RILA hedging strategies. Operationally, coordinating the hedging of two distinct product lines requires robust data aggregation, integrated modeling frameworks, and aligned governance structures. It demands consistent risk assessment, advanced IT systems to manage complexity, and cross-functional collaboration to address both product risks cohesively. Additionally, the risk management team must fully understand the unique risks of each product line to ensure effective execution. Regulatory and accounting considerations may also complicate the integration. And, to the extent that the RILA short put exposure does not perfectly offset the VA risk profile, the need for robust dynamic hedging of residual risk remains. Implications for macro hedging strategies for statutory capital management should also be considered.

Trade-offs between hedging and capitalizing for RILA and VA risk, within the VM-21 framework

VA and RILA are subject to the same valuation framework, VM-21, which specifies the requirements for principle-based reserves (PBR) as well as the market risk component within the Risk-Based Capital (RBC) framework for U.S. statutory capital. It is a natural framework for exploring trade-offs between use of hedge instruments and capital to fund claims arising from the products, and to capture diversification benefits from combining VA and RILA.

U.S STATUTORY CAPITAL FRAMEWORK

RBC is calculated according to the formula below, using separate distributions for material risk components, which are then aggregated with an allowance for diversification benefits. The total adjusted capital represents companies' statutory capital and surplus according to the U.S. statutory account principles.

$$RBC = C_0 + C_{4a} + \sqrt{(C_{1o} + C_{3a})^2 + (C_{1cs} + C_{3c})^2 + (C_2)^2 + (C_{3b})^2 + (C_{4b})^2}$$

$$RBC\ Ratio = \frac{Total\ Adjusted\ Capital}{RBC}$$

Companies typically target to hold at least 350% RBC as the statutory capital on the balance sheet. Holding additional "buffer" capital above the target is also a common approach for risk management.

The capital risks cover exposures associated with affiliates (C_0), assets (C_1), insurance (C_2), market (C_3), and business risks (C_4). The key risk components related to VA liabilities are C_{3a} and C_{3C}, which are the VA interest rate risk and VA equity risk, respectively. For RILA, the key risk components are C_{3C} and C_1, where C_1 captures the asset risks associated with the general account asset investments from the premium deposits. For VA products, there is also C_1 risk associated with the general account assets backing the business, but the magnitude is not as significant as the amount associated with RILA. The focus of this paper is on the market risk capital component on its own, which is effectively focusing on the conditional tail expectation (CTE) 98 measure per C_3 Phase II.

CTE 98 and CTE 70 represent the average of the worst 2% and 30% of outcomes, respectively, from the full set of stochastic results of future fund growth and interest rate paths. The CTE 70 is the reserve amount that the insurer must hold, and it is calculated on a pretax basis.[5] The total C_3 is approximately 25% of the difference between CTE 98 and CTE 70 calculated per the requirements specified under the National Association of Insurance Commissioners (NAIC) VM-21.[6] The C_3 is an after-tax calculation and targeting total asset requirement (TAR) at 400% RBC is roughly equal to the after-tax CTE 98.[7]

The VM-21 framework involves a stochastic real-world valuation that incorporates both asset and liability cash flows. The projection of assets reflects general account assets as well as derivatives used in hedging,[8] with potential credits for future rebalancing, and the projection of liabilities captures both rider and base product cash flows. The outcome for each scenario within the stochastic valuation captures the minimal amount of additional assets that the company needs to hold above the cash surrender value (CSV) to enable the company to meet all guarantee obligations along the projection path.

5. This assumes a company is not subject to additional standard projection amount (ASPA). The ASPA is a separate stochastic calculation based on prescribed mortality/policyholder behavior assumptions. Nonzero amounts arise when the prescribed assumptions are more conservative.
6. This is applicable to companies domiciled outside of New York. For the case of a company domiciled in New York, the valuation would follow Regulation 213 (Reg213), which is a special case ignored in this paper.
7. There are two different approaches for calculating the after-tax CTE 98. One of the approaches is deriving a pretax CTE 98 based on the same distribution as that used for the CTE 70 and then applying a high-level federal income tax (FIT) adjustment at the end, the Macro Tax Adjustment (MTA) approach. The alternative is to build all tax attributes within the stochastic calculation itself, the Specific Tax Recognition (STR) approach. When using the MTA approach, for companies not subject to ASPA and not capped at the non-admitted deferred tax assets, after-tax CTE 98 equals (CTE 98pre-tax – CTE70) x (1 – FIT) – (CTE70 – CTE70 x 0.9281) x FIT.
8. The 2023 NAIC Valuation Manual requires companies to reflect all future hedging strategies. The term "future hedging strategy" is a derivative program undertaken by a company to manage risks through one or more future hedging transactions, including the future purchase or sale of hedging instruments and the opening and closing of hedging positions.

This principle-based framework design recognizes the natural diversification benefit of VA and RILA products. On an unhedged basis, RILA payoffs to policyholders are most severe under market scenarios with strong positive index returns that drive contract crediting obligations. VA payoffs are associated with negative return scenarios that cause GMxB riders to be more in-the-money (ITM), increasing claims. Thus, the natural offset emerges between RILA liabilities paying off favorably in negative return scenarios and VA paying off favorably in positive return scenarios. However, such diversification benefits would vary depending on VA or RILA guarantee hedging, as the framework incorporates projected VA and RILA hedge program profit and loss (P&L) within the cash flow projection. The following analysis examines the magnitude of the diversification benefit and the trade-off that exists between hedging and capital management when combining VA and RILA business in the statutory framework.

VA AND RILA DIVERSIFICATION BENEFITS UNDER THE U.S. STATUTORY FRAMEWORK

Statutory valuations were performed on RILA stand-alone, VA stand-alone, and RILA + VA to quantify diversification benefits using an illustrative modeling framework.[9] Figure 7 shows the specifications for the hypothetical RILA and VA blocks used in the analysis. With its credited value tied directly to index performance, the RILA has a greater unit delta than VA, which leads to a sales mix with significantly less RILA needed to maximize the natural aggregation benefit between products. This sales ratio is explored in further detail below.

FIGURE 7: HYPOTHETICAL RILA AND VA BLOCKS

BASELINE CASE	RILA	VA
Cash Surrender Value (in $ thousands)	$170,000	$830,000, i.e., 5:1 ratio of VA:RILA
Policy Mix	Equal weight between SPX 1-year and 6-year standard point-to-point segments	Sample of GMIB[10] policies that are ATM on an actuarial basis

Four different hedge strategy combinations between the RILA and VA are examined in this analysis, each leading to a different level of CTE 98 and magnitude of diversification benefit in the aggregate valuation. For this analysis, we are just concerned with hedged versus unhedged risk, and do not quantify differences between static and dynamic replication of the hedges, such as additional yield that may be obtained by investing saved option premium in higher-yielding assets or potentially hedge ineffectiveness. We emphasize that these strategies were selected to capture varying degrees of hedging and are not intended to represent typical approaches in the industry. The strategies considered are:

- **No Hedge:** Leave both RILA crediting obligations and VA guarantees unhedged.
- **Partial RILA-Only Hedge:** Hedge the RILA call spread only, VA unhedged.
- **Partial Hedge:** Hedge the RILA call spread only, VA GMIB rider claims hedged.
- **Full Hedge:** Hedge the RILA put and call spread, VA GMIB rider fully hedged.

To reflect the VA hedging strategy, the valuation assumes an implicit hedge approach covering the appropriate rider cash flows and assumes all market risks are fully hedged. This approach assumes rider cash flows are effectively "hedged away" and replaced with the hedge cost, which equals the risk-neutral value of the rider cash flows as of the valuation date.

9. As part of this illustrative model, analysis was performed using market data as of June 30, 2022.

10. The analysis presented is intended to be represented of any GMxB riders commonly offered for VA products. "ATM on an actuarial basis" means the account value of the sample policy set is approximately equal to the actuarial present value of benefits.

Figure 8 summarizes the CTE 98 in excess of cash surrender value (CSV), or simply the "CTE 98 requirement," for each hedge strategy valuation described above. Here are some observations based on the results:

- Under the No Hedge case, although the RILA/VA ratio is 1:5, the CTE 98 of RILA is greater than that of VA. This is due to the substantial crediting obligations enabling the tail outcomes to be driven by high growth scenarios. Note in this case that the diversification benefit is the greatest because the RILA valuation drives tail outcomes, and under these scenarios the VA results are much more favorable relative to the VA stand-alone valuation.
- Once the call spread hedge is added under the Partial RILA-Only Hedge case, the RILA requirement reduces substantially. However, the aggregate CTE 98 is higher than No Hedge due to VA outcomes driving the tail now, and under those equity down scenarios the call spreads are not paying off.
- In the Partial Hedge strategy, the VA hedge effectively reduces the CTE 98 requirement for both VA only and the aggregate CTE 98, while maintaining a similar magnitude of diversification benefit as the Partial RILA-Only Hedge case.
- The Full Hedge strategy provides the lowest aggregate CTE 98 as the guarantee risk exposure in both VA and RILA is effectively hedged away. However, this also produces the lowest diversification benefit and the aggregate CTE 98 is driven by the VA.

FIGURE 8: CTE 98 IN EXCESS OF CSV (IN $ THOUSANDS)

HEDGE STRATEGY	VA	RILA	VA+RILA	DIVERSIFICATION BENEFIT
NO HEDGE	215,180	260,690	176,492	299,378
PARTIAL RILA-ONLY HEDGE	215,180	72,235	210,774	76,641
PARTIAL HEDGE	106,962	72,235	116,255	62,942
FULL HEDGE	96,951	4,432	93,267	8,116

The waterfall of hedge strategies quantified across the VA and RILA demonstrate that, intuitively, the CTE 98 requirement tends to decrease as more of the liability risk is hedged. To that end, fully hedging the VA GMIB rider and RILA crediting directly produces the lowest CTE 98 requirement. However, to achieve the lowest CTE 98 requirement a company would need to assume the full hedge cost associated with the hedge program and would not recognize the natural offsets in the product features, as evidenced by the low diversification benefit for the Full Hedge result. In practice, for a company looking to add RILA to a VA-dominated balance sheet via sales, some net exposure to falling equity markets is likely to persist for some time ("negative delta"). In the simple case of futures-based hedging, the expected hedge cost would grow in proportion to the assumed risk premium in equity returns relative to risk-free return and in proportion to the net delta.

In contrast, by not fully hedging the products, the company could realize significant savings in the hedge program but would require a larger amount of capital—approximately $83 million (or 8.3% of CSV) in the case of no hedging and the business mix assumed above, which is almost twice the level of capital when compared to the fully hedged basis. Because of the substantial diversification benefit—approximately $299 million as quantified in the case of no hedging—the additional capital requirement could be considered a manageable trade-off for some companies, when weighed against the expected return from reduced hedging. In particular, if the present value of future hedge cost savings exceeds the cost of capital associated with reduced hedging, and the illustrative company is comfortable with the potential earnings volatility that stems from reduced hedging, it could justify holding an additional capital buffer in lieu of fully hedging the products, allowing it to realize the diversification benefit. In practice, the "optimal" amount of hedging would be company-specific, potentially reflecting a company's own cost of capital, capital markets views (e.g., on equity risk premium), risk tolerance, and business mix.

VARYING THE VA/RILA SALES MIX

Figure 9 shows the CTE 98 requirement across a range of VA/RILA sales mixes when the products remain unhedged to capture diversification benefit. The CTE 98/CSV ratio can be a useful metric to gauge which sales mix produces the lowest rate of CTE 98 requirement. Whereas the base case results (5:1 sales) shows a 17.6% ratio, the 3:1 sales mix shows a 15.1% ratio, suggesting a slight improvement. This improvement is indicative of the most optimal level of delta offset between VA and RILA, where adding more RILA sales helps to offset residual VA risk exposure. As the sales mix starts to favor a heavier share of RILA, the higher relative delta of the RILA begins to dominate, leading to a less optimal CTE 98 requirement. In other words, the company in this example would be best positioned to target a 3:1 VA/RILA sales mix, but, if RILA sales run too hot, it could lead to a suboptimal degree of diversification benefit.

FIGURE 9: NO HEDGING – VARIED BY VA/RILA SALES MIX, COMPARISON OF CTE 98 EXCESS CSV

		5:1 SALES	3:1 SALES	1:1 SALES	1:3 SALES
(1)	**VA CSV**	830,000	750,000	500,000	250,000
(2)	**RILA CSV**	170,000	250,000	500,000	750,000
(3)	**VA**	215,180	194,440	129,627	64,813
(4)	**RILA**	260,690	383,367	766,734	1,150,101
(5)	**VA+RILA**	176,492	151,372	573,351	1,053,089
(6) = (5) – [(3) + (4)]	**Diversification Benefit**	299,378	426,436	323,010	161,826
(7) = (5) / [(1) + (2)]	**VA+RILA CTE98/CSV**	17.6%	15.1%	57.3%	105.3%

Figure 10 presents the same view as the table in Figure 9 but assumes both the VA and RILA are fully hedged. As noted previously, this approach leads to the lowest level of requirement, but viewing different sales mixes indicates an optimal VA/RILA sales mix. With the risk exposure of the VA and RILA effectively hedged, the level of CTE 98 requirement does not vary as much across alternatives as the unhedged case, but the pattern indicates that more RILA sales is optimal, as the 1:3 sales mix shows the lowest CTE 98/CSV ratio of 3.2%. With the index-crediting effectively managed, shifting to a larger share of RILA sales contributes more profits without adding tail exposure, achieving an improved offset against the VA.

FIGURE 12: FULL HEDGING – VARIED BY VA/RILA SALES MIX, COMPARISON OF CTE 98 EXCESS CSV

		5:1 SALES	3:1 SALES	1:1 SALES	1:3 SALES
(1)	**VA CSV**	830,000	750,000	500,000	250,000
(2)	**RILA CSV**	170,000	250,000	500,000	750,000
(3)	**VA**	96,951	87,606	58,404	29,202
(4)	**RILA**	4,432	6,518	13,036	19,554
(5)	**VA+RILA**	93,267	82,581	51,591	31,730
(6) = (5) – [(3) + (4)]	**Diversification Benefit**	8,116	11,543	19,849	17,026
(7) = (5) / [(1) + (2)]	**VA+RILA CTE98/CSV**	9.3%	8.3%	5.2%	3.2%

Conclusion

Integrating RILA with VA portfolios presents significant risk management synergies for VA writers. The complementary nature of downside exposures, stemming from the offsetting risk exposures within the products and coupled with the hedging needs between the two products can allow insurers to improve real-world collateral management and realize cost savings. By internally offsetting the put options required for VAs with those sold for RILAs, insurers can potentially achieve greater efficiency in managing equity risk, thus enhancing portfolio yields and reducing overall hedging costs. Moreover, under the VM-21 framework, aggregating the valuation of RILA and VA can provide diversification benefits, reducing the total capital requirements associated with any unhedged risks, and enabling quantification of trade-offs between use of hedging and capital to fund claims. This trade-off is important to monitor as insurers continue to sell RILA and VA products, as the diversification benefits can shift and potentially deteriorate over time along with the sales mix.

As the RILA market continues to expand and evolve, understanding these synergies within an insurer's existing portfolio along with the impact of planned or potential new business is crucial to success. It is possible that new product innovations in the RILA market, such as novel crediting strategies or GLWB riders, meaningfully impact how the product behaves as an operational and reporting complement to VAs. With this knowledge, companies can progress toward optimal, integrated hedging strategies that promote strong statutory valuation and robust risk management, while still achieving sustainable growth.

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