Variable Annuity market update, Q3 2024

December 2024

Milliman

Featured article: NAIC GOES scenario generator update

The National Association of Insurance Commissioners (NAIC) continues moving forward with its efforts to reform the Generator of Economic Scenarios (GOES) to be used in principle-based reserving (PBR) in the United States, and which will replace the existing Academy Interest Rate Generator (AIRG). Most recently, this entailed a second industry field test, supported by published model office results to understand potential impacts to statutory requirements on business subject to PBR, notably VM-21 reserves and C-3 Phase II capital for variable annuities (VAs).

Leveraging a model that we developed in our 2023 paper[1] on this topic, the analysis presented in this abridged article aims to provide very brief commentary around the potential risk management implications of the proposed scenarios. It is important to note that while our model is intended to be illustrative of a prototypical VA block, it may not be representative of a given company's situation. Additionally, while there still remains some uncertainty around the final adopted version of GOES, specifically the parameterization of Conning's GEMS scenarios[2] that formed the basis of the second industry field test, as well as when it will be formally implemented,[3] signaling from the NAIC and the potential materiality of the new scenarios underscores their importance, making a strong case for the type of analysis presented here.

We encourage the interested reader to review our complete paper,[4] which considers the VM-21 reserve and C-3 Phase II capital impacts of the proposed scenarios under a range of capital market sensitivities and varying hedge strategies, providing a detailed view of tail risk measures.

COMPARING THE AIRG AND GEMS SCENARIOS

Both the AIRG and GEMS scenarios as of December 31, 2023, were calibrated based on a wide range of acceptance criteria. There are several points of commentary worth noting based on comparisons of the scenario output.

- **Equity volatility**: Although individual index volatilities are comparable, a measure of blended equity returns produces higher realized volatility in the GEMS model in part due to stronger positive correlation between equity indices.
- **Bond returns**: The GEMS model offers a more sophisticated corporate model that reflects stochastic, mean-reverting credit spreads. This can lead to higher average returns but also considerably more volatility in bond returns.
- **Rate distribution**: The average, range, and volatility differences in the observed 10-year rate point to a much wider distribution of projected rate scenarios in the GEMS model compared to the AIRG.

FIGURE 1: AIRG AND GEMS

BLENDED EQUITY[5]	AIRG	GEMS	GEMS – AIRG
Average Return	10.0%	9.6%	-0.4%
Realized Volatility	17.9%	18.2%	+0.3%
Sharpe Ratio @ 3% risk-free	39%	36%	-3%

1. Davidson, C., Motiwalla, Z., & Henley, P. (July 2023). NAIC economic scenario reform: A model for VM-21 impact analysis. Milliman white paper. Retrieved December 24, 2024, from: https://www.milliman.com/en/insight/naic-economic-scenario-reform-vm21-impact-analysis.
2. Specifically, the GEMS "Field Test 1" set of scenarios that use a starting yield curve of December 31, 2023.
3. As of the date of publication, public NAIC comments have suggested a January 1, 2026, adoption at the earliest, consistent with the expected earliest (optional) adoption date for VM-22, the PBR framework for non-variable annuities.
4. Our full paper, Davidson, C., Motiwalla, Z., Henley, P. et al. (November 2024), Here it "GOES" again: Reviewing the NAIC's second industry field test of the Generator of Economic Scenarios, can be found at: https://www.milliman.com/en/insight/here-it-goes-again-naic-second-industry-field-test. We encourage the reader to review the full paper for more details.
5. Returns are shown on an annualized basis. Blended equity assumes 40% large cap, 20% international, 20% small cap, and 20% aggressive equity.

LONG-TERM CORPORATE BOND	AIRG	GEMS	GEMS – AIRG
Average Return	4.6%	5.9%	+1.3%
Realized Volatility	6.6%	12.5%	+5.9%
Sharpe Ratio @ 3% risk-free	24.5%	22.9%	-1.6%

INTEREST RATES – 12/31/2023 CURVE	AIRG	GEMS	GEMS – AIRG
Average ultimate 10Y rate	3.33%	4.98%	+1.65%
25**th** Percentile ultimate 10Y rate	2.52%	2.62%	+0.10%
75**th** Percentile ultimate 10Y rate	3.88%	6.90%	+3.02%
Average 10Y rate volatility	1.27%	3.26%	+1.99%
Initial 10Y-3M spread	-1.59%	-1.59%	0.00%
Average 10Y-3M spread after 10 years	1.09%	0.67%	-0.42%
Average 10Y-3M spread after 30 years	1.10%	1.21%	0.11%
Frequency of 10Y-3M Inversion	9.3%	21.9%	12.6%
Average Difference when Inverted	0.54%	1.19%	0.65%
Frequency of Negative 3M Rate	0.0%	7.5%	7.5%

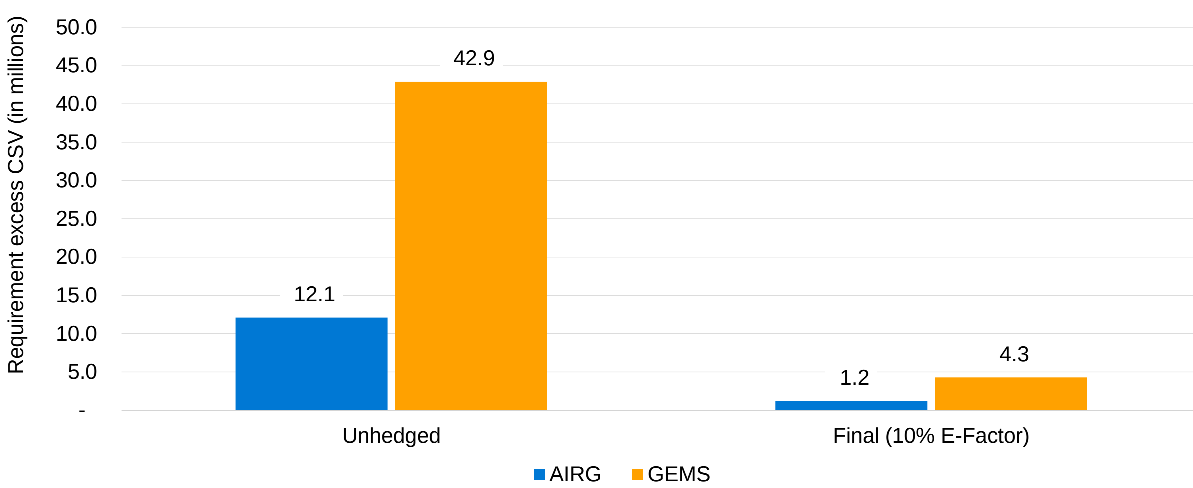
IMPACT ANALYSIS

The valuation model[6] used to facilitate the analysis in this paper is kept consistent across runs used for each scenario set and is intended to reflect assumptions and methodology that are considered illustrative of VA business.

The baseline model runs assumed a $10 billion cash surrender value (CSV) in-force book. This section details the impacts to VM-21 reserves in excess of CSV and after-tax conditional tail expectation (CTE) 98, also in excess of CSV. After-tax CTE98 total asset requirement (TAR) is equivalent to VM-21 reserves plus a target 400% level of C-3 Phase II capital, or simply referred to as “CTE98 TAR.” We have assumed a future hedging strategy and 10% E-factor for the best-efforts component of the calculation.

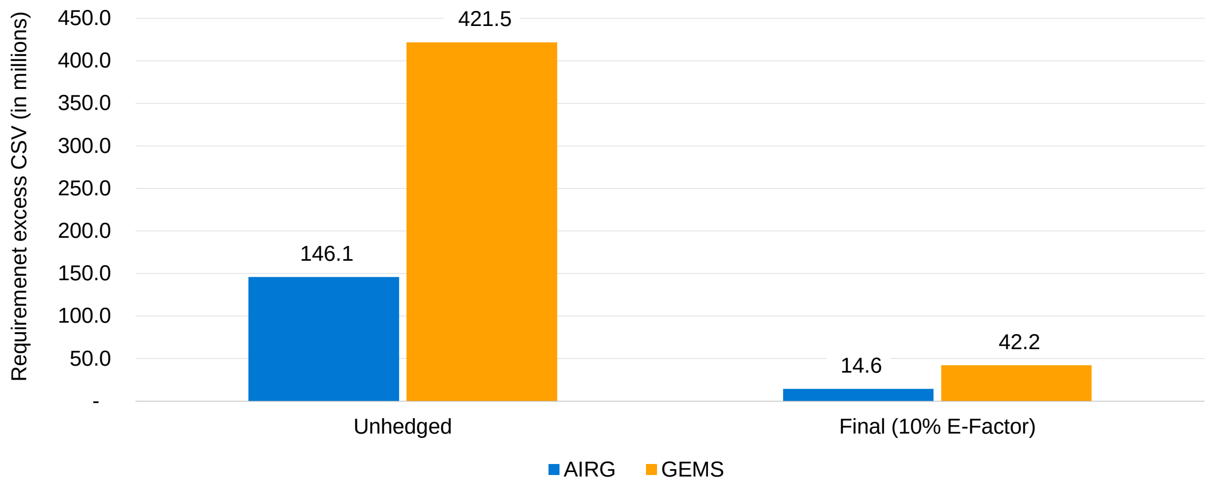
The initial baseline case reserves across each scenario set, as of December 31, 2023, is shown in Figure 3. Alternatively, Figure 4 presents CTE98 TAR.

FIGURE 3: VM-21 RESERVES



6. See Davidson, C., Motiwalla, Z., Henley, P. et al. (November 2024), Here it 'GOES' again: Reviewing the NAIC's second industry field test of the Generator of Economic Scenarios, at https://www.milliman.com/en/insight/here-it-goes-again-naic-second-industry-field-test for more details on the VA model design.

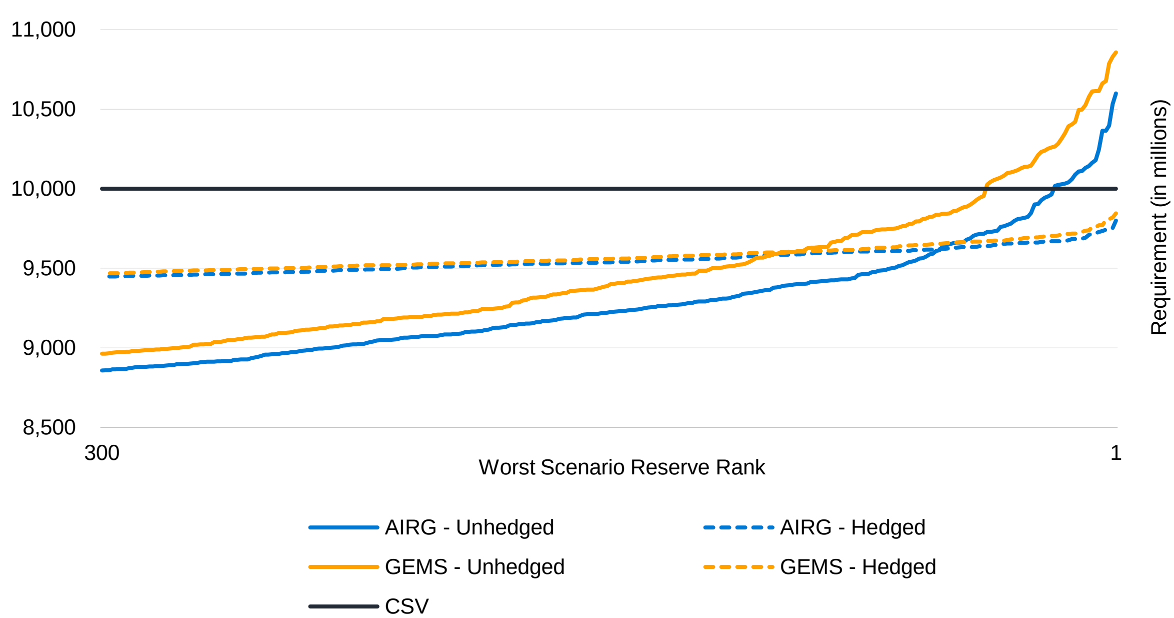
FIGURE 4: CTE98 TAR



These results illustrate that, on an unhedged basis, the GEMS scenarios produce materially higher TAR than the AIRG—*totaling +$275 million for the modeled business.* However, with an effective hedge strategy modeled, the difference between the GEMS and AIRG scenarios is dramatically reduced. Still, these results suggest a moderate TAR increase for the VA business: *+$28 million*, which represents a 290% increase in TAR.

It is important to emphasize how the impact of the GEMS scenarios will vary across companies. Within this analysis, the base case business and assumption mix produces a hedged CTE98 that is bound by the CSV floor, so the impact of the GEMS scenarios is directly tied to the amount of unhedged liability cash flow[7] impact contributing to the final TAR. Furthermore, to the extent that market conditions change or product features and assumptions vary dramatically from the base case, the materiality of the GEMS scenarios is expected to change.

FIGURE 5: SCENARIO-LEVEL REQUIREMENT FOR CTE70 SCENARIOS



7. This includes cash flows generated by the base contract as well as rider cash flows retained due to assumed hedge ineffectiveness.

Analyzing the results by CTE level, we find that:

- GEMS produces a consistently higher requirement by scenario, but this increase is significantly compressed on a hedged basis, consistent with reserve impacts shown in Figure 3.
- GEMS has 39 scenarios (so 3.9% of the total 1,000 set) producing a requirement above the CSV floor, more than twice the 19 scenarios above the floor from the AIRG result.
- Shifting from unhedged to hedged results significantly reduces the dispersion by scenario for both hedged and unhedged, resulting in a remarkably close pattern of results between GEMS and AIRG. Remaining variation across scenarios is driven by the unhedged cash flows and assumed hedge ineffectiveness.

CONCLUDING THOUGHTS

Given the complexity of VA business and the diversity of risk factors across companies, no model is going to perfectly capture the impact of the proposed GOES scenarios on statutory reserves and capital. However, the impact analysis presented in this paper intends to shine light on general themes that should be representative of what companies might expect.

These themes include:

- An increase in reserves and capital, which could be significantly reduced if an effective future hedge strategy is reflected in the CTE calculation
- Similar equity sensitivity, but increased rate sensitivity with GEMS scenarios

The complete version of our paper[8] also discusses the impact of alternative future hedging strategies, including either a full vega hedge or including the base contract cash flows in the hedge target. Generally, we observe less reserve and capital exposure to the GEMS scenario impact in each of these cases.

As the GEMS scenarios are finalized, companies should begin evaluating the implications of the new scenarios on not only their required levels of reserves and capital but also on other key metrics and risk management practices. For example, the change in market shock sensitivities could necessitate an adjusted hedge portfolio. Or companies may need to consider the impact of how fund exposure maps onto the new array of equity and fixed income funds offered on the GEMS model. Through detailed analyses like these, companies will gradually become prepared for the new GOES model once the NAIC gives final word on implementation parameterization and timing. Doing so will enable them to develop the technical and business prowess necessary for successful risk management going forward.

8. We encourage the reader to review our full paper for more details. Davidson, C., Motiwalla, Z., Henley, P. et al. (November 2024), Here it 'GOES' again: Reviewing the NAIC's second industry field test of the Generator of Economic Scenarios. Available at : https://www.milliman.com/en/insight/here-it-goes-again-naic-second-industry-field-test.

U.S. market update

- Q2 2024 year-to-date (YTD) sales were up 25.2% to $60.0 billion from $47.9 billion in Q2 2024 YTD.
- Registered index-linked annuity (RILA) sales continue to surpass traditional variable annuity (VA) sales similar to previous quarters in 2024.

FIGURE 6: U.S. VARIABLE ANNUITY SALES ($ BILLIONS)

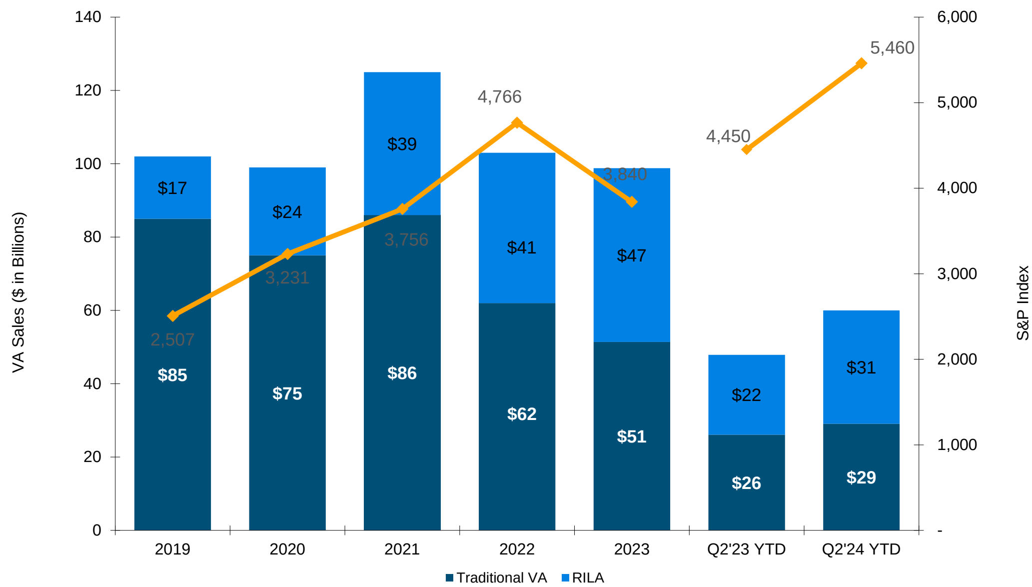


FIGURE 7: U.S. VARIABLE ANNUITY SALES BY COMPANY ($ MILLIONS)

Rank	Company	Q2'24YTD	Q2'23YTD	YoY	2023	2022	2021
1	Equitable Financial	$10,867	$8,399	29%	$17,882	$15,094	$14,566
2	Jackson National Life	7,330	5,772	27%	11,926	14,540	19,026
3	Allianz Life of North America	4,567	3,003	52%	6,795	5,867	7,011
4	Brighthouse Financial	4,213	3,542	19%	7,528	7,062	8,312
5	Lincoln Financial Group	4,079	3,915	4%	7,910	8,770	10,971
6	Prudential Annuities	4,045	2,409	68%	5,033	5,274	6,344
7	TIAA	3,675	3,717	-1%	7,242	7,626	7,901
8	Nationwide	3,146	2,290	37%	4,701	5,199	8,003
9	New York Life	2,937	2,651	11%	4,951	5,060	5,264
10	RiverSource Life Insurance	2,526	1,813	39%	3,981	4,046	5,968
11	Pacific Life	1,851	1,389	33%	2,774	3,376	5,578
12	Corebridge Financial	1,821	2,110	-14%	3,865	5,631	8,009
13	Transamerica	1,130	561	101%	1,461	703	1,259
14	Fidelity Investments Life	908	586	55%	1,322	1,228	2,424
15	Thrivent Financial for Lutherans	707	796	-11%	1,439	2,106	2,821
16	Athene Annuity & Life	568	420	35%	851	903	566
17	Protective Life	562	382	47%	782	748	1,027
18	Principal Financial Group	540	NA	NA	NA	NA	NA
19	TruStage	536	518	3%	1,031	1,296	1,565
20	Massachusetts Mutual Life	505	423	19%	968	1,162	778
	Other	3,488	3,205	9%	6,358	7,207	7,908
	Total	**60,000**	**47,900**	**25%**	**98,800**	**102,900**	**125,300**

Product trends of U.S. VA guarantee benefits

TRADITIONAL VARIABLE ANNUITIES

Lincoln

- Lincoln raised GLWB rates on certain higher age bands on its Lincoln ProtectedPay series:
  - Added the age bands 75-79 and 80+ (instead of 75+).
  - As an example of an increase, on the ProtectedPay Select Core, the 75-79 band was increased to a guaranteed withdrawal rate of 6.55% for single and 6% joint life. The guaranteed withdrawal rate for the same age band on the ProtectedPay Secure Core was increased to 6.90% single and 6.30% joint life.

Brighthouse

- Brighthouse's FlexChoice Access GLWB rates were increased uniformly by 0.50%. Example age 65 single life rates:
  - FlexChoice Access Level: 6%
  - FlexChoice Access Expedite: 8.5%. If AV falls to zero: 3.5%

Protective

- Protective updated its Protective Aspirations VA, including new advance payout options, a nursing home withdrawal rate cap increase, and new maximum daily value death benefit.:
  - Updated the SecurePay Protector GLWB:
    - The standard payout option has a set of GLWBs for the life of the rider.
    - The new Advance payout option guarantees a relatively high GAWA percentage initially (in guarantee periods of three, five, eight and 10 years), then a lower percentage after the conclusion of the guarantee period.
    - The rider no longer has the requirement that in order for a rollup to be applied, the client's account value can fall no lower than 50% of the benefit base.
  - SecurePay nursing home (NH) enhancement: This is an enhancement available with the GLWB. The NH withdrawal rate cap has been increased to 15% (was previously 10%).
  - New Maximum Daily Value death benefit: Available up to issue age 77, the new Maximum Daily Value death benefit provides the greater of contract value, premiums less withdrawals, or the greatest daily value up to the deceased owner's 83rd birthday.

REGISTERED INDEXED ANNUITES

Brighthouse

Brighthouse launched its next generation RILA, including Shield Level II six-year, Shield Level three-year, Shield Level Advisory, Shield Level Pay Plus II, and Shield Level Pay Plus II Advisory. The latter two now offer a lifetime withdrawal benefit. The Level Pay Plus II GLWB rider details are:

- Rider fee: 1.50%.
- There are limits on allocation options once the GLWB starts.
- There are three age bands: 59½-64, 65-74 and 75+. For the latter two age bands, the withdrawal percentage varies based on the contract year in which the GLWB starts.
- The structure allows for two withdrawal tiers, one that applies before the client's AV is exhausted and the other that applies should the AV fall to zero. At launch, the rate sheet offered the same rates for both scenarios.
- Two different benefits: Market Growth (base may grow by an annual ratchet to account value prior to age 91) and Market Growth with Rollup (both the ratcheting and an annual 5% rollup that lasts for 10 years in years no withdrawals are taken).

Members Life

Members Life closed the TruStage Horizon II RILA.

Corebridge

Corebridge launched Corebridge MarketLock, its first RILA.

- The RILA offers a unique investment strategy called the Lock Strategy. It is the only available RILA strategy account option that locks and credits a rate based on actual S&P 500 index performance on the day the preset growth target is reached, securing these gains automatically and immediately—even if the target is hit before the strategy term's end date. After the gains are locked in, consumers are guaranteed a fixed rate of interest until the next contract anniversary (set at 1% at launch), when they can transfer assets to any available strategy account option. Growth targets for the Lock Strategy are 30%, 40% or 50% for three-year terms and 50%, 75% or 100% with six-year terms. The 10% buffer is currently available with the Lock Strategy.
- Indices offered: S&P 500 and Nasdaq-100.
- Term lengths: one-year, three-year and six-year.
- There are 20 different strategy account options using various crediting methods: Lock, Cap, Trigger, Dual Direction with Cap, Participation, and Cap Secure Strategies. The Cap Secure Strategy uses an annual cap that is constant across the six-year term.
- Buffers offering downside protection: 10%, 20% (depending on the strategy option chosen).
- At launch, participation rates were set at 100%, except for the six-year S&P 500 Participation strategy option, which was set at 108%.
- There is no guaranteed living benefit rider.

International VA markets

JAPAN

As of the end of September 2024, the following are the key companies in Japan with the highest VA/variable life (VL) underwriting balances and their separate account balances, along with the changes from June 2024:[9]

- MS Primary, JPY 1,363 billion (-5.8%)
- Daiichi Frontier, JPY 314 billion (-16.1%)
- Sony Life, JPY 4,834 billion (+7.5%) (Note that the balance of Sony Life's separate account includes the balance of variable insurance.)
- Nippon Life, JPY 124 billion (-8.0%)
- Credit Agricole, JPY 86 billion (-24.7%)

TAIWAN

- First-year premium (FYP) sales of VAs as of Q2 2024 were around TWD 3.3 billion, 1.4% higher than Q2 2023.
- FYP sales of variable life as of Q2 2024 were around TWD 28.2 billion, 1.3% higher than Q2 2023.
- 2024 YTD sales of variable products have been 5.5% lower versus 2023 YTD.
- According to the disclosure from the Life Insurance Association R.O.C., the decrease in sales has been due to:
  - New regulations on variable products taking effect on January 7, 2023, have put restrictions on the fund choices and cash-back (in the form of automated partial withdrawal) and on bonus mechanisms. The announcement of these regulations had a positive impact on sales prior to June 2023 as the customers wanted to buy the products before the new restrictions, resulting in higher year-to-date sales compared to Q2 2024.

9. Source: Q2 FY 2024 financial statement.

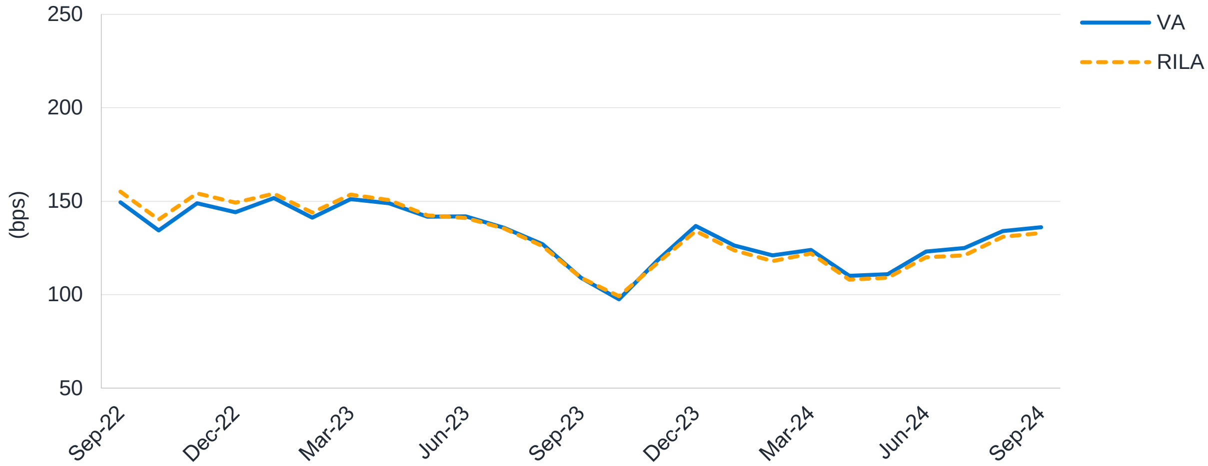
Risk management

MILLIMAN HEDGE COST INDEX™ AND U.S. MARKET COMMENTARY

September 2024 update

- In Q3 2024, U.S. equity markets performed strongly, reaching record highs. Market movements were influenced by mixed sentiments on labor data, improvements in inflation figures, sell-offs in large-cap tech stocks due to the unwinding of the Japanese carry trade, and the Federal Reserve's decision to cut rates by 50 bps in September. The S&P 500 gained 5.53% for the quarter, with steady increases of 1.13% in July, 2.28% in August, and 2.02% in September. The Nasdaq also posted gains, declining by 0.75% in July but recovering with gains of 0.65% in August and 2.68% in September, ending the quarter up 2.57%. The Russell 2000 surged by 10.10% in July, declined by 1.63% in August, and rose slightly by 0.56% in September, closing Q3 up 8.90%. The Dow Jones climbed 4.41% in July, increased by 1.76% in August, and rose 1.85% in September, ending the quarter up 8.21%.
- Continuing the trend from Q2, Q3 showed further easing of inflation. The CPI came below expectations at 3.0% YoY in July, dropped to 2.9% in August, and declined to 2.5% in September, with MoM figures showing a decrease of 0.1% in July and increases of 0.2% in both August and September. The PPI eased after initially exceeding expectations, with YoY figures at 2.6% in July, dropping to 2.2% in August, and aligning with expectations at 1.7% in September. The Fed's preferred inflation measure, PCE, remained steady at 2.5% YoY in July and August before declining to 2.2% in September. Q2 GDP growth was annualized at 3.0%, slightly above the forecasted 2.9%, while personal consumption fell short, reaching 2.8% in September against the 2.9% forecast.
- The labor market remained strong, with nonfarm payrolls slightly exceeding expectations in July, adding 206,000 jobs. However, August and September underperformed, adding 114,000 and 142,000 jobs, respectively. The unemployment rate held steady, moving from 4.1% in July to 4.3% in August and then to 4.2% in September. ADP Employment Change figures were consistently below expectations, recording 150,000 in July, 122,000 in August, and 99,000 in September.
- In the industrial sector, production increased by 0.6% in July, fell by 0.6% in August, and rose by 0.8% in September. Capacity utilization remained stable, ending the quarter at 78.0%. The housing market showed mixed results: Housing starts rose 3.0% in July, dropped 6.8% in August, and rebounded by 9.6% in September. Building permits exceeded expectations, increasing by 3.4% in July, falling by 4.0% in August, and rising by 4.9% in September. Existing home sales declined by 2.5% in September, while new home sales fell by 4.7%.
- During the September FOMC meeting, the Fed cut the federal funds rate by 50 basis points, lowering the rate to 4.75% to 5.00%. Jerome Powell noted the economy continues to expand at a solid pace, with job gains slowing but unemployment remaining low. He also indicated progress toward the 2% inflation target, with no signs of an imminent recession. The yield curve shifted from inversion to steepening, experiencing a bull flattening; the two-year yield ended the quarter at 3.64% and the 10-year yield at 3.78%, with the 2s10s spread turning positive at 14 basis points.
- In commodities and currencies, gold experienced volatility, peaking at $2,672.38 in September and ending the quarter with a 13.23% gain at $2,634.58. The U.S. Dollar Index fell by 4.81% over the quarter, likely due to expectations of future rate cuts. The VIX closed at 16.73, up 4.29 points from the previous quarter, peaking at 38.57 in early August. The term structure flattened, with the front end rising by four points and the back end by one point. The SPX one-year skew shifted higher, indicating increased downside protection demand.

FIGURE 8: EXPECTED HEDGE COST* (136 BPS FOR VA AND 133 BPS FOR RILA AS OF SEPTEMBER 2024)[10]



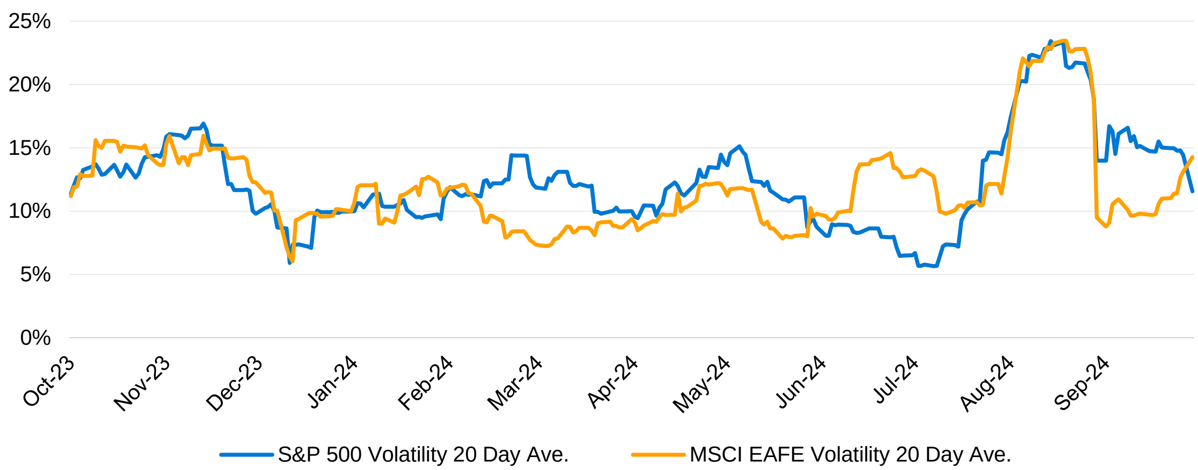
RISK-MANAGED FUNDS ON VA PLATFORMS

Risk-managed funds on VA platforms, Q3 2024

The U.S. VA fund space continues to see few new fund launches in 2024 with only six new funds launching in Q3. Five of the six funds launched are core building-block-style investment strategies from a newly established adviser entering the market, while the sixth fund was a new series added to an existing target-date fund lineup. The U.S. VA market did not have any risk-managed investment strategies launch in Q3 2024.

The graph below illustrates the average 20-day realized volatility for S&P 500 and MSCI EAFE as two representative indices. During the second quarter of 2024, the average 20-day realized volatility for the S&P 500 and MSCI EAFE was 14.99% and 14.36%.

FIGURE 9: INDEX VOLATILITY



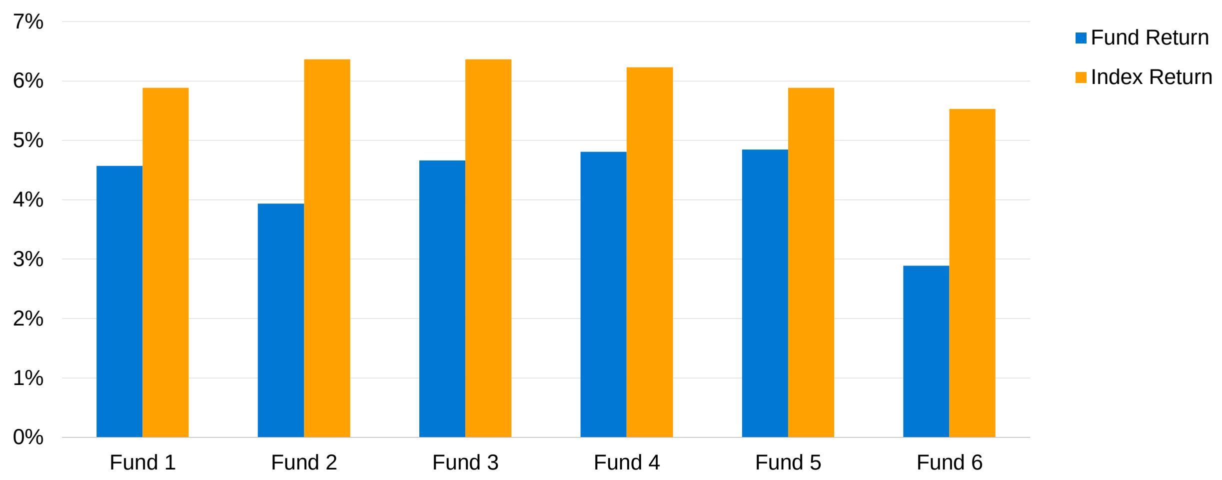
Source: Bloomberg.

10. Milliman recently completed a review of the design of its Hedge Cost Index and implemented some changes to align product features and assumptions with those prevalent in the VA marketplace. Details regarding this update can be found in the Index Methodology document at http://www.milliman.com/mhci-methodology.

We selected six different indicative managed risk fund strategies available within VA products. Each fund's quarterly return and realized volatility profiles are shown below. The following notes were observed in Q3:

- Fund 4, a managed volatility fund, was the best-performing fund on a risk-adjusted basis in Q3 across the peer group. The fund benefited from strong returns in both its equity and fixed income portfolios. At quarter-end, the fund's broad asset allocation was approximately 63% equity, 34% fixed income, and 3% cash and cash equivalents.
- Fund 5, a managed volatility fund, produced the highest absolute return and the highest level of volatility over the quarter, leading it to be the worst performer in the peer group on a risk-adjusted basis.
- Fund 6, a defined outcome fund, produced the lowest return over the peer group as the S&P 500 PR Index ended the quarter up above the fund's upside cap. Yet the fund has a gross 2.1% upside cap remaining between September 30, 2024, and the options reset date in December.

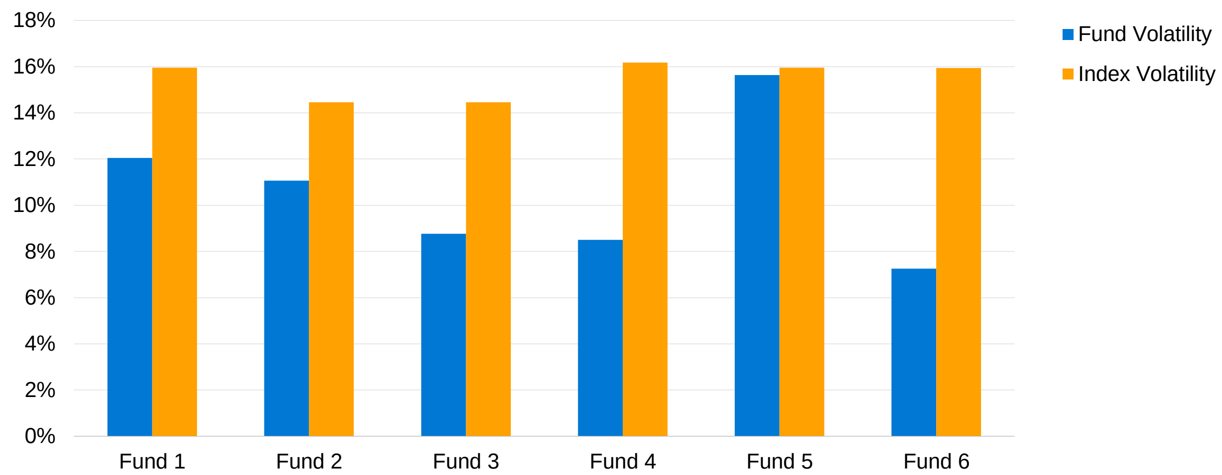
FIGURE 10: FUND RETURNS, Q2 2024



Source: Bloomberg.

Benchmarks: Fund 1: S&P 500 TR; Fund 2: MSCI World NR; Fund 3: MSCI World NR; Fund 4: Russell 3000 TR; Fund 5: S&P 500 TR;, Fund 6: S&P 500 PR.

FIGURE 11: FUND VOLATILITY, Q2 2024



Source: Bloomberg.

Benchmarks: Fund 1: S&P 500 TR; Fund 2: MSCI World NR; Fund 3: MSCI World NR; Fund 4: Russell 3000 TR; Fund 5: S&P 500 TR; Fund 6: S&P 500 PR.

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Data has been obtained from the following reports by LIMRA Secure Retirement Institute: U.S. Individual Annuity Sales (2018 Annual, 2019 Annual, 2020 Annual, 2021, 2022 Annual, 2023 Annual and 2Q 2023 YTD and Q22024 YTD).

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FEATURED ARTICLE

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