

MILLIMAN REPORT

Indexed annuities: U.S. statutory accounting

July 2022

Yan Fridman, FSA, MAAA
Karthik Yadatore, FSA, MAAA



Table of Contents

SECTION I: EXECUTIVE SUMMARY	1
SECTION II: INDEXED ANNUITIES.....	2
PRODUCTS	2
INDEX CREDIT HEDGING	2
SECTION III: STATUTORY ACCOUNTING	3
CURRENT REGULATION	3
SURPLUS VOLATILITY	3
REGULATORY RESPONSE.....	6
SECTION IV: CONCLUSION.....	9

Section I: Executive Summary

Indexed annuities have been around for a few decades and continue to have robust sales. Starting as a vehicle that provided policyholders an equity participation while preserving the principal, and known as equity indexed annuities from the outset, these products have evolved over time to offer income protection via guaranteeing lifetime withdrawal benefits and to allow policyholders more equity participation by relaxing the principal preservation in what became known as registered index-linked annuities.

Terminology changed sometime in the first decade of this century and most people refer to the annuities with full principal protection as fixed-indexed annuities. The impetus for the name change notwithstanding, the new name signifies what many practitioners had learned by then: from an insurer's point of view, indexed annuities are practically indistinguishable from fixed deferred annuities, as the entire equity risk associated with index credits can be hedged away, and what remains is a fixed deferred annuity.¹

Despite the fact that the insurer risks inherent in fixed-indexed annuities are similar to those in traditional fixed deferred annuities, statutory reserve and capital requirements in the United States treat them differently. While fixed deferred annuities generally enjoy a straightforward recognition and measurement of the assets and liabilities, leading to a predictable and understandable surplus development, there is a profound mismatch between asset and liability determination under a variety of market conditions, leading to noneconomic surplus volatility for fixed-indexed annuities. Insurance regulators in a few states (Iowa, Kansas, and Ohio) have recognized the issue and passed legislation to alleviate it, while most of the states continue to use the standard National Association of Insurance Commissioners (NAIC) methodology, leaving insurers in those states in search of alternative solutions.

The required capital structure penalizes insurers with fixed-indexed annuities compared to those with the fixed deferred annuities. The former were excluded from the scope of an inaugural principle-based capital framework known as C3 Phase I. As such, companies with profitable well-matched business may be required to hold twice as much capital on simple fixed-indexed annuities as on otherwise comparable fixed deferred annuities.

This paper is the first of two papers that we intend to publish during the summer of 2022. Following this paper, which focuses on the asset-liability mismatch, we will publish a paper on the required capital for fixed-indexed annuities.

The field tests expected in 2023, related to principle-based reserving for non-variable annuities (VM-22), should be able to help the industry understand the implications on surplus volatility and required capital for fixed-indexed annuities. We encourage insurers to participate in the tests and keep a close eye on the principle-based reserving and capital development. However, there will still likely be situations where complete resolution of the matters described in our two papers is not possible.

In this paper we:

- Describe the current statutory accounting rules governing indexed annuities.
- Provide an example demonstrating the noneconomic nature of surplus volatility.
- Examine a situation of a significant market decline in late 2018 to demonstrate a reduction in surplus.

¹ We assume here that there are no riders attached to this policy. Small differences may still exist from the fixed deferred annuities.

Section II: Indexed annuities

PRODUCTS

Indexed annuities come in two flavors: fixed-indexed annuities (FIA) and registered index-linked annuities (RILA).

FIA and RILA typically offer indexed accounts, where periodic interest crediting depends on a market performance subject to caps, participation rates or spreads, and fixed accounts, where periodic interest crediting is based on declared interest rates. Non-guaranteed elements are declared to policyholders in advance for each indexing period.

FIA and RILA have evolved to include riders and guarantees such as guaranteed lifetime withdrawal benefits and death benefits, with policyholders paying for such benefits either explicitly via rider charge or implicitly via lower credited rates.

While annual reset point-to-point products, where policyholders receive an index appreciation annually before a new set of non-guaranteed elements is declared, are most popular, a variety of product features exist with caps credited monthly, participation rates applied over several years, etc. In the case of RILAs, additional design features include floors and buffers that determine policyholder returns in times of negative market performance. Each feature adds its own peculiarity to the workings of the FIA and RILA and deserves to be studied separately.

INDEX CREDIT HEDGING

FIA and RILA writers have historically utilized static or dynamic hedging programs to cover market performance.

Non-static options often include macro hedging or delta hedging programs that consider expected benefit payments for the lifetime of a policy or a block of policies. The static option strategy includes, for an annual reset point-to-point FIA policy, purchasing a call spread where a one-year call option is purchased at-the-money and another one-year call option is written with the strike price at the declared cap. This way the option payoff is identical to the index credit to policyholders and such a strategy creates a perfect hedge. (In reality, companies purchase hedges in bulk to cover a number of policies, consider implications of policies that terminate partially or fully during the year for which options are bought, and take into account the capital efficiency of the derivatives that might result in over-hedging. There is also an unhedgeable policyholder behavior risk. For the sake of simplicity, we ignore these elements in this paper.)

Section III: Statutory accounting

CURRENT REGULATION

The current U.S. statutory accounting rules governing FIA and RILA treat the options that are used to hedge the index credit and the statutory reserves subject to Actuarial Guideline XXXIII and XXXV (AG 33/35) differently. Although the hedge payoff is effectively passed through to the policyholders, and the company is generally indifferent to the actual equity return, there is a non-perfect symmetry in the movement of the market value of the options and the statutory reserves between policy anniversaries.

To a large extent, this has to do with the overarching floor of cash surrender value on the U.S. statutory reserves. While AG 33/35 has several types and methods with multiple benefit streams under consideration, in many cases the reserve for a given policy without a minimum guaranteed benefit can usually be approximated as the greater of three values (reserve for death benefits and annuitization benefits is ignored for simplicity):

- Current cash surrender value
- Discounted value, to the valuation date, of the projected surrender value at the next policy anniversary
- Discounted value, to the valuation date, of the projected surrender value at the end of the surrender charge period for that policy

In addition, if there is an appreciable mismatch between the index crediting determination date and policy anniversary date, using a curtate Commissioners Annuity Reserve Valuation Method (CARVM) will result in lower reserve amounts, which further dampens reserve responsiveness.

The market value of the call spread purchased to match the cap will fluctuate between zero and the cap. Because the statutory reserve is not economic, a decrease or increase in the market value of the hedge will not result in a similar change in the reserve due to the current cash surrender value floor.

Large negative market movements between policy anniversaries lead to large surplus decreases on the valuation date (other than the policy anniversary), which may result in a false alarm to regulators and other stakeholders. Unless there are significant lapses, the surplus reduction will reverse by the next policy anniversary, regardless of future market performance.

SURPLUS VOLATILITY

To illustrate the surplus volatility created by the NAIC accounting framework, let us consider changes in surplus for an FIA policy without any riders or minimum guarantee benefits, with the index-related interest credited annually on a point-to-point basis that is hedged statically. We calculate reserves using the curtate CARVM determined by the Market Value Reserve Method (MVRM) Using Black-Scholes Projection.

Further, for ease of explanation, we will assume:

- No surrender charges
- A cap of 5%
- An initial cost of option of 2.5% of the indexed account value, and 97.5% of the indexed account value is invested in non-option assets
- A reserve discount rate of 4%
- A yield on non-option assets backing the reserve of 5%

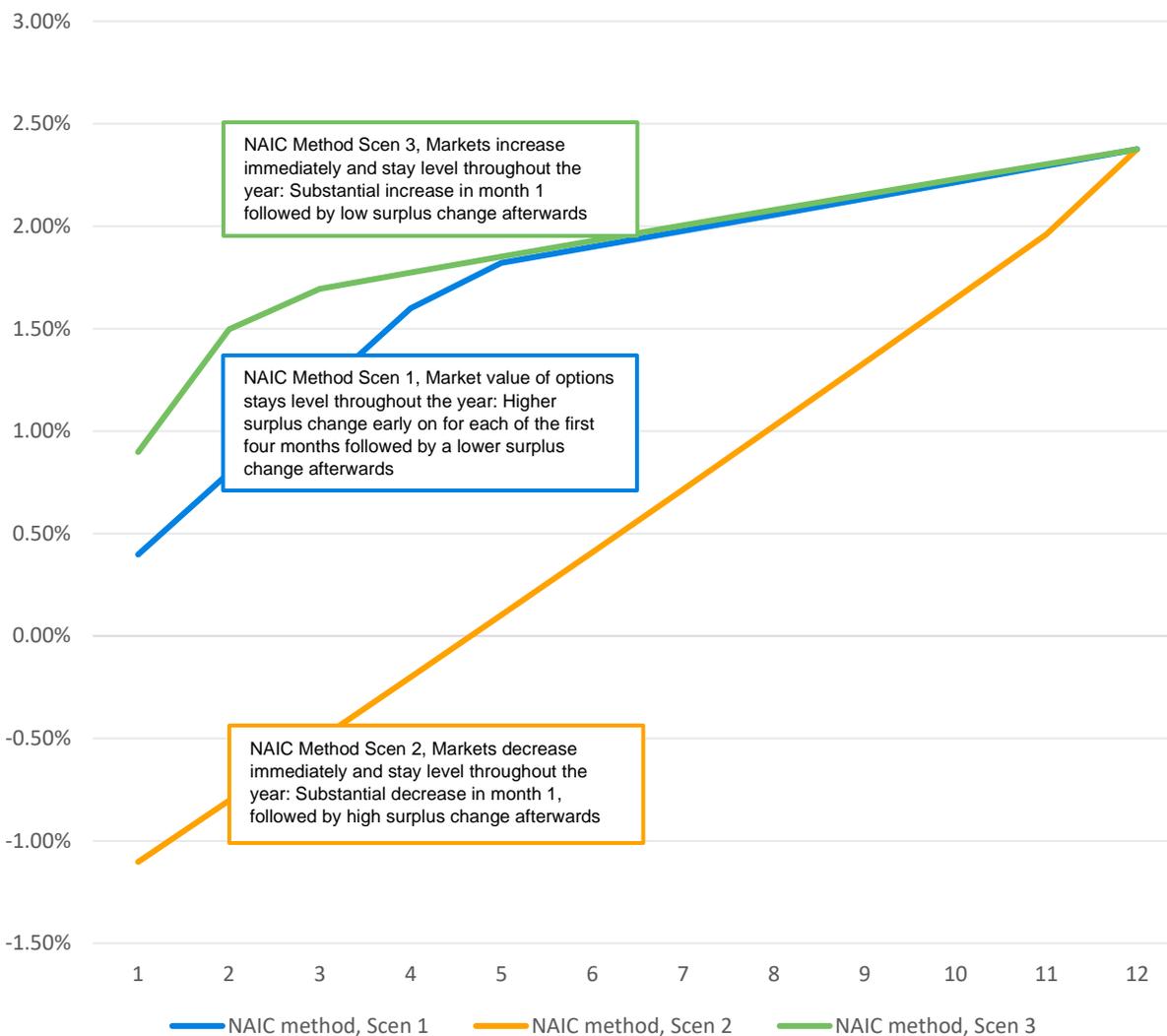
Using these assumptions (ignoring expenses, mortality, and persistency), we expect a one-year change in surplus of 2.38%, calculated as the yield on non-option assets of 5% * 97.5% less the option cost of 2.5%.

Three scenarios, illustrated in Figure 1, are considered below:

1. NAIC Method Scenario 1: Market value of options stays level throughout the year.
2. NAIC Method Scenario 2: Markets decrease immediately and stay level throughout the year.
3. NAIC Method Scenario 3: Markets increase immediately and stay level throughout the year.

Each of the scenarios produces a total surplus of 2.38% over the year, indicating volatility created by accounting is noneconomic.

FIGURE 1: SURPLUS (IGNORING TAXES) BETWEEN POLICY ANNIVERSARIES



We note, however, that there are several other reserving methods provided by AG 33/35, the application of which may lead to different results.

Now consider the drop in the equity markets in late 2018. For simplicity, we assume that the business for a hypothetical FIA block is distributed uniformly throughout the year, with each calendar month representing \$100 of business, for a total of \$1,200 of indexed account value in force.

Figure 2 shows a market value of the S&P call spread options as of September 30, 2018, and December 31, 2018, with each such option assumed to have been purchased on the first of the month for the block of FIA being hedged. Each in-flight option lost substantial value in the fourth quarter of 2018 as the S&P 500 index declined by 14%. As a result, the total after-tax market value of options decreased considerably. At the same time, the statutory reserves would have declined by a much smaller margin owing to the floor described above.

FIGURE 2: NAIC STATUTORY ACCOUNTING

Policy anniversary (1), (2)	Market Value (MV) options Calculated using Black- Scholes		Option Maturity (4)	Option Purchase	Total Option Impact, before tax	Statutory Reserve, MVRM Using Black-Scholes Method	
	9/30/2018	12/31/2018				4Q18	4Q18
1/1/2018	\$4.2	\$0.0			(\$4.2)	\$102.1	\$100.0
2/1/2018	\$3.1	\$0.0			(\$3.1)	\$101.2	\$100.0
3/1/2018	\$4.0	\$0.6			(\$3.4)	\$101.5	\$100.0
4/1/2018	\$4.4	\$1.6			(\$2.8)	\$101.6	\$100.4
5/1/2018	\$4.0	\$1.3			(\$2.8)	\$101.1	\$100.0
6/1/2018	\$3.7	\$1.0			(\$2.6)	\$100.6	\$100.0
7/1/2018	\$3.7	\$1.2			(\$2.5)	\$100.5	\$100.0
8/1/2018	\$3.3	\$1.0			(\$2.3)	\$100.0	\$100.0
9/1/2018	\$2.9	\$0.8			(\$2.1)	\$100.0	\$100.0
10/1/2018	\$5.0	\$0.9	\$5.0	\$2.6	(\$1.8)	\$103.3	\$105.0
11/1/2018	\$4.9	\$1.7	\$5.0	\$2.6	(\$0.9)	\$103.0	\$105.0
12/1/2018	\$4.5	\$1.5	\$5.0	\$2.6	(\$0.6)	\$102.5	\$105.0
Total	\$47.7	\$11.5	\$15.0	\$7.9	(\$29.1)	\$1,217.5	\$1,215.4
Impact of options, before tax							
Change in statutory reserve							
Net investment income on non-option assets							
Tax (3)							
Change in surplus between 9/30/2018 and 12/31/2018							

Notes:

(1) Options purchased in October, November and December include those purchased in 2017 for the 9/30/2018 valuation. Such options expired in 4Q18 and were replaced by new options purchased that quarter.

(2) We have estimated option values assuming hedges were bought for each policy on its anniversary; however, reserve calculation assumes some mismatch between the option purchase date and anniversary with the reserve for 1/3 of the policies being at cash surrender value irrespective of the option value.

(3) Tax reserve is assumed to be identical at 9/30/2018 and 12/31/2018.

(4) Option payoffs occur due to the S&P 500 index increasing in excess of the cap rate of 5%.

REGULATORY RESPONSE

Assuming a perfect static hedging for FIA index appreciation, on an economic basis, FIA products become fundamentally similar to fixed deferred annuities where equity market movements do not influence the net liability. Option budgets that determine the caps, participation rates, and spreads on indexed annuities are akin to credited rates on fixed annuities. The fixed annuity credited interest constitutes an expense for an insurer, and so does the cost of purchasing a call spread on an indexed annuity. The excess of the net investment income earned on the assets supporting the reserve over the interest expense determines the interest spread, the main profitability driver of fixed and indexed annuities.

Recognizing that, in 2009 Iowa prescribed a certain practice² for the insurers domiciled in that state that would correct the volatility issue. In essence,

- (1) Call options are reported at amortized cost with one-twelfth of the initial option cost recognized in earnings every month
- (2) AG 33/35 reserves do not consider index appreciation between policy anniversaries
- (3) Upon each policy's anniversary, its index credit is recognized in the reserve and is offset by the value of the maturing option

As a result, between policy anniversaries, only the option cost amortization is reflected. This creates a stable and predictable earnings pattern with no misalignment on the policy anniversary, provided effective hedge. Hedge effectiveness here is not referred to in its usual statutory definition; however, demonstrating a tight relationship between option payoff and the amounts hedged is a requirement in the law.

Some other states have recently followed suit. Kansas³ and Ohio⁴ passed similar legislation in 2019 and 2021, respectively.

Figures 3 and 4 provide a picture similar to those shown in the previous section illustrating the alternative method. Figure 3 shows a much smoother surplus progression over the year for all three scenarios described in Figure 1 (we left the surplus development associated with the NAIC method for comparison). The variance between the surplus difference shown in Figures 2 and 4 is \$11.70 per \$1,200 of overall block reserves. This means that, for a company with \$12 billion of FIA reserves, such variance would be approximately \$117 million. In addition, the 2018 equity drop happened at year-end, which meant all the statutory financials had to recognize a precipitous noneconomic drop in value. A distress signal like that could be misinterpreted by regulators, rating agencies, and potential future customers.

We hope that future regulatory efforts will alleviate the surplus timing issue and it remains to be seen whether the final VM-22 standard will accomplish the task. At present, however, we believe that the overriding cash value floor will continue to exist and asset accounting rules are not expected to change; so surplus volatility will exist even if in a modified form.

In 2023 the NAIC plans to run a field test to study the impacts of VM-22. Writers of FIA and RILA (in case certain RILAs are in scope of VM-22) might be wise to understand the impact of proposed reserving requirement changes on surplus volatility.

Even if the new reserving standard helps, it may only do so on new business, if VM-22 applies to business written after the standard becomes effective.

FIA and RILA writers domiciled in Iowa, Kansas, and Ohio may also want to understand how the existing state law would work together with future regulations.

² The full text of the Iowa legislation is available at <https://www.legis.iowa.gov/docs/ACO/chapter/02-09-2011.191.97.pdf>.

³ The full text of the Kansas legislation is available at http://www.kslegislature.org/li_2020/b2019_20/measures/documents/hb2177_enrolled.pdf.

⁴ The full text of the Ohio regulation is available at <https://codes.ohio.gov/ohio-administrative-code/rule-3901-1-67>.

FIGURE 3: SURPLUS (IGNORING TAXES) BETWEEN POLICY ANNIVERSARIES INCLUDING ALTERNATIVE ACCOUNTING

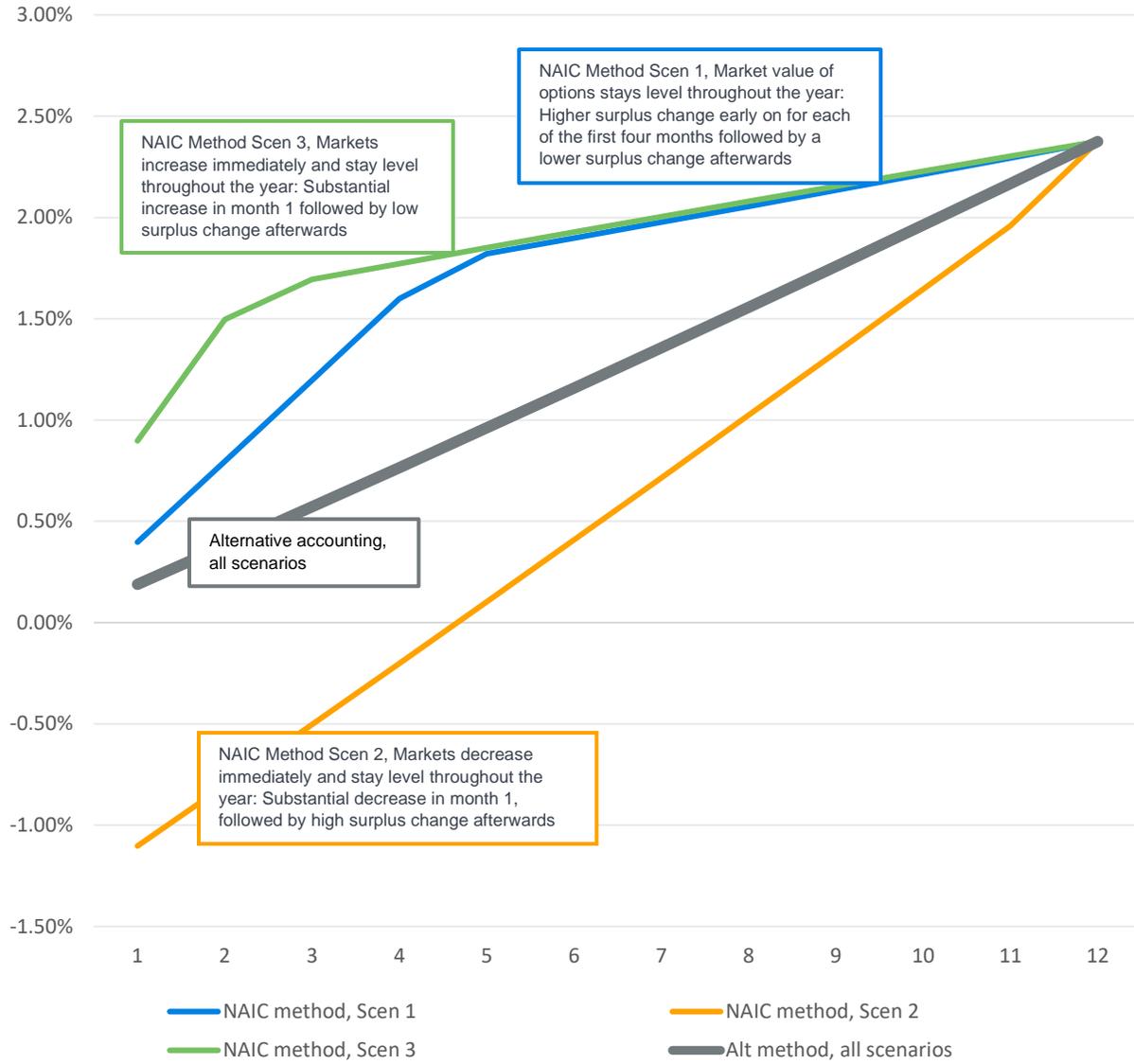


FIGURE 4: ALTERNATIVE ACCOUNTING

Policy anniversary (1), (2)	Options, amortized cost		Option Maturity (4)	Option Purchase	Total Option Impact, before tax	Statutory Reserve, Alternative Basis	
	9/30/2018	12/31/2018	4Q18	4Q18	4Q18	9/30/2018	12/31/2018
1/1/2018	\$0.6	\$0.0			(\$0.6)	\$100.0	\$100.0
2/1/2018	\$0.8	\$0.2			(\$0.6)	\$100.0	\$100.0
3/1/2018	\$1.0	\$0.4			(\$0.6)	\$100.0	\$100.0
4/1/2018	\$1.3	\$0.6			(\$0.6)	\$100.0	\$100.0
5/1/2018	\$1.5	\$0.8			(\$0.6)	\$100.0	\$100.0
6/1/2018	\$1.7	\$1.0			(\$0.6)	\$100.0	\$100.0
7/1/2018	\$1.9	\$1.3			(\$0.6)	\$100.0	\$100.0
8/1/2018	\$2.1	\$1.5			(\$0.6)	\$100.0	\$100.0
9/1/2018	\$2.3	\$1.7			(\$0.6)	\$100.0	\$100.0
10/1/2018	\$0.0	\$2.0	\$5.0	\$2.6	\$4.3	\$100.0	\$105.0
11/1/2018	\$0.2	\$2.2	\$5.0	\$2.6	\$4.4	\$100.0	\$105.0
12/1/2018	\$0.4	\$2.4	\$5.0	\$2.6	\$4.4	\$100.0	\$105.0
Total	\$13.8	\$14.1	\$15.0	\$7.9	\$7.4	\$1,200.0	\$1,215.0
Impact of options, before tax					\$7.4		
Change in statutory reserve					(\$15.0)		
Net investment income on non-option assets					\$15.0		
Tax (3)					(\$4.7)		
Change in surplus between 9/30/2018 and 12/31/2018					\$2.7		

Notes:

(1) Options purchased in October, November and December include those purchased in 2017 for the 9/30/2018 valuation. Such options expired in 4Q18 and were replaced by new options purchased that quarter.

(2) We have estimated option values assuming hedges were bought for each policy on its anniversary.

(3) Tax reserve is assumed to be identical at 9/30/2018 and 12/31/2018.

(4) Option payoffs occur due to the S&P 500 index increasing in excess of the cap rate of 5%.

Section IV: Conclusion

In the current U.S. statutory framework for annuities, accounting for assets and for liabilities are generally de-linked from each other. In AG35, an attempt was made to recognize index appreciation in the reserve computation. Index-related interest credited is often statically hedged, as insurance companies buy and sell call options (and sometimes put options in the case of RILA). While the reserve determination is complicated by considering multiple benefit streams, including a cash value floor, the options that hedge index appreciation do not have similar limitations. The result is a noneconomic surplus volatility that exists for each indexed annuity policy within an index crediting period.

This volatility is not a concern in stable market conditions but becomes visible when markets fluctuate. Year-ends 2008 and 2018 were prime examples. Significant market drops at year-end caused the surplus to be depressed, as reserves were largely floored at cash surrender value while the market value of options declined considerably.

Companies with significant exposure to indexed annuities, other than those domiciled in Iowa, may have experienced a large reduction in their risk-based capital (RBC) ratios. Insurers domiciled in Iowa recognized this issue during the 2008-09 global financial crisis and worked with the Iowa regulator to put in place an accounting regime that removed the noneconomic volatility. In the past three years, Kansas and Ohio have adopted similar regulations.

Although a new statutory reserving standard—VM-22, currently in development—may be able to alleviate certain aspects causing the surplus volatility issue, companies with significant indexed annuity exposure are encouraged to review their financial projections and consider management actions to address surplus volatility concerns. If surplus volatility risk cannot be accepted, some actions may include reinsurance or discussions with regulators to follow Iowa, Kansas, and Ohio.



Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

[milliman.com](https://www.milliman.com)

CONTACT

Yan Fridman
yan.fridman@milliman.com

Karthik Yadatore
karthik.yadatore@milliman.com