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Chairperson's Corner: Bringing on Disruption

By Simpa Baiye

Change is here. Disruption is alive and well. Over the next two years, U.S. life insurance actuaries across insurance functions will experience the impact of substantial changes to the GAAP reporting of long-duration contracts; the mandatory adoption of life principle-based reserving; and reforms to statutory reserving, capital and interest rate hedge accounting for variable annuities. This period will be, without doubt, a very busy period for financial reporting actuaries.

At the heart of these changes lies regulators' decades-long desire to better align measures of solvency with long-term product risks and investors' desire to get a clearer view of the emergence of earnings and value. The work of actuaries involved in financial reporting has been to assist these constituents in getting a clear picture of insurers' financial condition and to help employers make sound strategic and tactical decisions about their businesses. Actuaries will need to pursue these noble objectives in the principle-based valuations of liabilities, in making extensive disclosures, and in modeling the complex interactions between insurance assets and liabilities.

Change management will prove to be an essential skill in helping organizations plan for and manage the implementation of accounting reforms in a way that makes the best use of time and minimizes disruptions to other functional priorities. Actuaries are well positioned to lead the way to a more complex reporting future in their respective organizations. Central to this leadership opportunity are 1) getting equipped and 2) being able to communicate with multiple stakeholders. Getting equipped means taking advantage of tools and processes that can increase productivity and having a second look at how responsibilities are shared across actuarial teams. It could also mean getting a better



perspective on how insurance assets (and not just liabilities) are measured and reported. Communicating with stakeholders, however, is probably the more crucial ability. In the words of the great motivator Tony Robbins, "To effectively communicate, we must realize that we are all different in the way we perceive the world and use this understanding as a guide to our communication with others."

Our work as the section council will be to equip you with the tools you need to succeed this year and beyond. Cutting-edge content delivered via podcasts and articles, webcasts on emerging issues and targeted meeting sessions are but a few of the ways we plan to help. To the changes and disruption ahead, we say: Bring it on. We will be ready. ■



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The Great MOCE Debate

By Stephen J. Strommen

MOCE is an abbreviation of “margin over current estimate.” The great MOCE debate is over whether the measurement of insurance contract liabilities for financial reporting purposes should include a MOCE and, if so, how that MOCE should be calculated. This debate has occurred in many contexts in recent years as the accounting treatment of insurance has been evolving. One current context is in connection with ICS 2.0, the international capital standard that the International Association of Insurance Supervisors (IAIS) is developing.

In this article, I argue that a MOCE should be included in the estimate of insurance liabilities for accounting purposes and that the cost of capital should be the basis of the MOCE. The major alternatives are that either MOCE should not be included or that it should be calculated using what is called a “prudence” approach, based on a probability level or conditional tail expectation (CTE).

The first section of this article explains how the cost-of-capital concept is fundamental to the financial framework of the insurance business. It is at the very root of the insurance business model.

The second section focuses on financial reporting, arguing that if measurement of earnings is to be consistent with the business model, then the cost of capital should play a role in that measurement.

Where financial reporting is concerned, there are historical precedents and practical considerations to consider. Those are addressed at the end of this article, where it is shown that the cost-of-capital concept for MOCE explains some important

historical precedents, provides a consistent approach to many issues under current debate, and that practical considerations involved with its application can be easily addressed.

FINANCIAL FOUNDATIONS OF THE INSURANCE BUSINESS

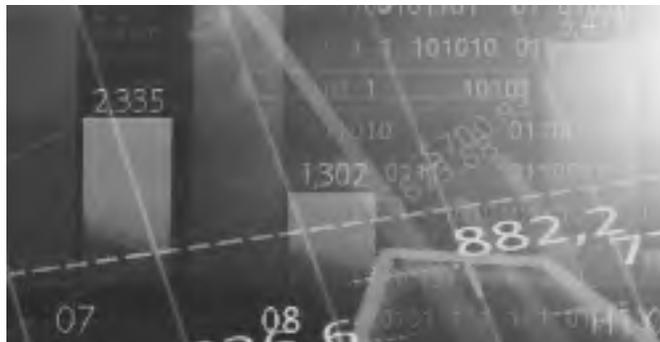
Insurance is by nature a risk-management business. An insurance company must maintain capital to draw upon in the event of adverse claims experience. Insurers try to grow and diversify in order to reduce the likelihood and magnitude of adverse experience, but that possibility cannot be eliminated. So, insurers must have capital and must have investors to supply that capital and allow it to be put at risk. Investors expect a return higher than the risk-free rate on the capital they provide. The extra return, or risk premium, is the cost of capital. It is the product of the amount of capital required and the size of the risk return spread that investors demand. The cost of capital is recovered by charging the customers more than the expected cost of claims and related expenses. To attract capital from investors, insurers charge premiums that include a profit margin that at least covers the cost of capital.

An insurance company must be able to attract and retain capital from investors to remain viable. Therefore, the cost of capital is a required cost of doing business. Viewing it as a cost may seem to be at odds with the accounting treatment where the cost of capital is part of what is presented as profit or earnings. Nevertheless, in this article, I will take the conceptual view that the cost of capital is a required cost of doing business because it is a fundamental part of the economic business model for insurance.

THE ACCOUNTING FRAMEWORK AND MEASUREMENT OF EARNINGS

An accounting framework is used to report an insurer’s financial condition, including net earnings and the amount of capital held. Premiums and investment returns are the main income items, while claims and expenses are the main disbursements. The balance sheet includes mainly invested assets on one side, while the other side must be divided between liabilities and capital.

Liabilities arise because premiums are normally paid before claims are paid. In the interim between premium payment and claim payment, there is a liability for the future payment of the claim. The question at hand is what should be included in the liability. Certainly, future claim payments should be included. Most actuaries agree that future policy-related expenses should be included. I suggest that the cost of capital should be included, since it is a required cost of doing business. Let’s examine why this makes sense, focusing on the emergence of earnings with an accounting framework.



If the premium for a new insurance contract is paid at the end of a reporting period, any excess of the premium payment over the liability that is set up is recognized as income immediately. In later periods, any excess of the liability released over the claims and expenses incurred is recognized as income in that period. Therefore, the contents of the liability determine the timing of income recognition. (I ignore investment income here for simplicity—more on that later.) If the liability includes only expected future claims and expenses, then expected future earnings are zero. Any margin included in the liability represents an expected amount of future earnings that have been deferred. Following this logic, **the purpose of having a margin in the liability is to defer the recognition of earnings.** This is especially important in the case of insurance contracts that span several reporting periods, that is, long-term contracts.

The purpose of the liability margin can be distinguished from the purpose of holding capital. **The purpose of capital is to provide a very high likelihood that all obligations will be met when experience is worse than expected.**

If one accepts that the purpose of liability margins is to govern earnings emergence, what then should be the expected pattern of earnings recognition for long-term insurance contracts? I suggest that not all earnings should be recognized immediately; some earnings should be deferred. Further, I suggest that the earnings deferral should be consistent with the financial foundations of the business model and therefore based on an estimate of the cost of capital. Other concepts also lead to this idea. The concept of release from risk, combined with the idea that the cost of capital represents the market price of risk, lead directly to this approach. Earnings equal to the market price of risk should not be expected to be reported until the end of a period when the insurance coverage is provided and the company is released from the risk. If the cost of capital is the market price of the risk, then the earnings deferral and the reserve margin should be based on the cost of capital.

Note that this framework allows any expected earnings in excess of the cost of capital to be recognized immediately upon issue of a new contract. The immediate recognition of any “excess” earnings is a separate topic and will not be addressed further here.

Some actuaries argue that the purpose of having a margin in the liability is to provide a safety margin, that is, to provide a more than 50 percent likelihood that the reserve will be adequate to fund future obligations. Of course, any kind of margin will accomplish that, so a cost-of-capital margin could be accepted under that view. But some actuaries extend that concept and confuse the purpose of liability margins with the purpose of capital. They suggest that the safety margin in the liability should be measured in probability terms because its purpose is

not to defer earnings but to provide a high likelihood that all obligations will be met. With that alternate purpose in mind, they suggest that the margin in reserves should be based on the statistical distribution of possible outcomes, such as an 80 percent likelihood or 70 percent CTE level. The level they choose is arbitrary and therefore widely debated. When the margin in reserves is based on this view, the expected pattern of emergence of earnings is very different. It tends to be back-ended and loses all connection with the cost of capital and the business model.

The difference can be striking. The charts below show mortality margins and the pattern of margin release over time for a simple 20-year term life insurance contract. The margins under each approach were calibrated so that they would be approximately equal for a mature block of such business.

Figure 1 shows the size of the margin by number of years to policy expiry. Note that for a short-term contract (or a long-term contract nearing its expiry), the cost of capital margin is dramatically smaller than the percentile margin. The difference for short-term contracts can easily be a factor of five or more. On the other hand, for long-term contracts far from expiry, the cost-of-capital margin is substantially larger than the percentile margin. The patterns cross at very roughly 10 years to expiry.

This durational comparison of margins tends to hold in general; it is not unique to term life insurance, although the exact patterns do vary by type of contract.

Figure 1
Reserve Margins by Years to Expiry

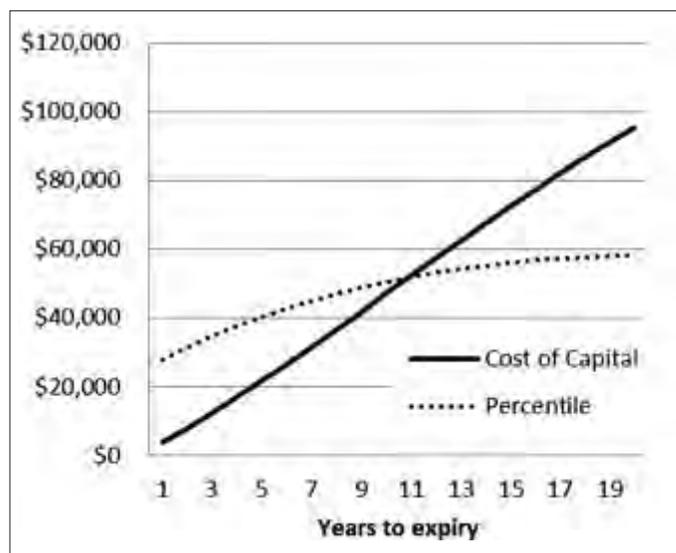
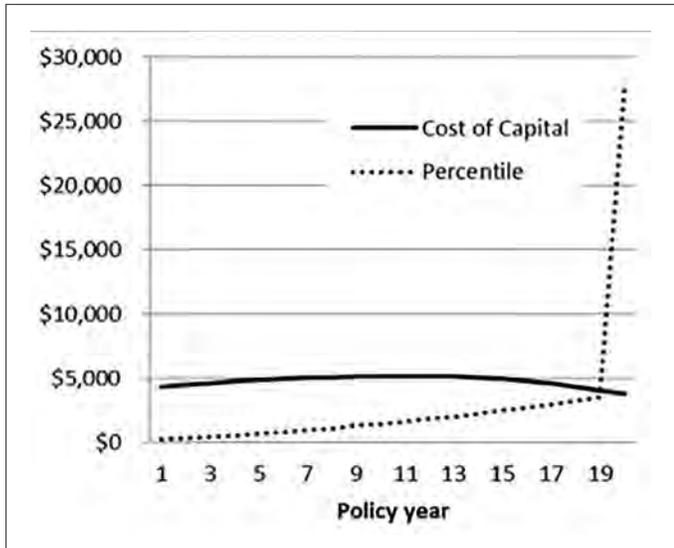


Figure 2 shows the pattern of margin release by policy year. Since margin release represents the expected future earnings, this is the pattern of expected future earnings by policy year. Under the cost-of-capital approach, this pattern is nearly level, because the amount released each year is the cost of capital. Under the percentile approach, the earnings release is back-ended to a significant degree.

Figure 2
Margin Release by Policy Year



HISTORICAL PRECEDENTS AND RECENT DEVELOPMENTS RELATING TO MOCE

The cost-of-capital approach to MOCE explains many things. It helps explain why historical differences in accounting for short- versus long-term contracts developed. It also provides answers to many questions, and solutions to a number of issues that have arisen during the recent evolution of accounting for insurance contracts both in the United States and internationally. The subsections below provide a sampling of places where the cost-of-capital approach to MOCE provides insight.

Historical Accounting Methods and Short- vs. Long-Term Contracts

Regulatory accounting for life insurance has traditionally included significant margins in the reserve liability. Regulatory accounting for short-term property/casualty (P/C) contracts has not, and there is resistance from P/C insurers to adding margins. Why this difference?

The cost-of-capital framework for margins provides two good answers: One is the size of the margin, and the other is the degree to which the liability margin affects capital requirements.

The size of the margin was discussed previously, but here's a numerical example. Consider a P/C company with capital equal to 30 percent of liabilities and a cost of capital rate of 5 percent. Assuming an average one-year contract duration, the cost-of-capital margin would be about $30\% \times 5\% = 1.5\%$ of liabilities. That's pretty insignificant next to the uncertainty in claims estimates. On the other hand, consider a life insurance company with contracts whose average lifetime is at least 20 years, with capital equal to 15 percent of liabilities and a cost of capital rate of 5 percent. The cost of capital would be $15\% \times 5\% = 0.75\%$ of liabilities per year, present valued over 20 years. The 20-year annuity factor may be about 12, putting the margin at $0.75\% \times 12 = 9.0\%$ of liabilities. Relative to liabilities, that's six times as large as for P/C and clearly NOT insignificant. So, we see that a cost-of-capital margin would be insignificant for short-term contracts and significant for long-term contracts, and that may partly explain why accounting has developed with different treatment for the two kinds of business.

The other reason is the interaction between liability margins and capital. Are liability margins part of capital or part of the liability? Capital requirements are generally based on the size of potential losses over a defined period of time at a defined percentile. Since liability margins are released over time, the amount of margin released during the defined time period is an expected profit that shifts the distribution of potential losses during that time period. In effect, that part of the margin is an offset to the capital requirement. For short-term contracts, the entire margin is released during that time period, so the entire margin is essentially capital. For long-term contracts, it depends on the time period. When the defined time period is short (as in Solvency II), then only a small fraction of the margin is released during that period, so most of the margin represents a liability, not capital.

The IAIS is considering a MOCE in developing its proposed international capital standard, but there is debate over whether it should be considered an offset to capital. As described above, the cost-of-capital framework provides a clear conceptual answer to this issue. It also explains why P/C insurers generally argue that the MOCE is part of capital, while life insurers tend to argue that it is part of the liability. The truth varies by company.

More Recent Developments in Insurance Accounting

For long-term contracts, there has been an evolution in recent decades away from formulaic measurement of insurance liabilities and toward the principle-based idea that the liability should be set equal to the value of the assets sufficient to fund the future obligation in terms of its cash flows. The concept of a replicating portfolio has been used to suggest that the value



of an insurance obligation is equal to the value of its replicating portfolio, that is, a portfolio with exactly the same cash flows.

True replicating portfolios rarely exist, but this concept has been used to argue for approaches to setting the discount rate and including margins when taking the present value of future liability cash flows. Arguments are that the discount rate should be less than the total return on risky assets because there is no provision for default in the liability cash flows. And a margin for claims variability should be included because risk aversion is known to affect asset prices.

Let's view this in the framework of setting the liability equal to a current central estimate and a MOCE.

To get the central estimate, we compute the present value of future liability cash flows (with no defaults) using a discount rate. If this is to be a true central estimate, then the discount rate should be a central estimate of the total return (net of defaults) on the assets.

To get the margin for risk in a cost-of-capital framework, we add an implicit cash flow equal to the cost of capital and apply the same discounting. The MOCE is added to the central estimate to obtain the liability.

This conceptual approach differs from the calculation procedure under every one of the recently proposed accounting frameworks (e.g., PBR, IFRS 17, ICS 2.0, Solvency II) in one fundamental way. The discount rate is never allowed to be a central estimate of the asset earnings rate. It is always lower. That means that the amount called the central estimate is not a central estimate; it includes a margin.

Conceptually, the spread between a central estimate of the asset earnings rate and the mandated discount rate represents a margin for investment risk that is present in the assets but not in the liability cash flows. The spread is conceptually equivalent to an estimate of the cost of capital, based on just the part of capital that is attributable to investment risks. In other words, this process mandates inclusion of an implicit cost-of-capital margin for investment risk in the central estimate.

Given that every one of the recently proposed accounting and capital frameworks implicitly includes a cost-of-capital margin for investment risks in the central estimate, it is surprising that there is debate over the conceptual basis of the margin for other risks. Internal consistency suggests using the same cost-of-capital basis for all margins. One can only speculate that debate arises due to a historical difference between actuarial and financial approaches to risk. To many actuaries, risk is characterized by a probability distribution, so that approach is often applied



to claims risks. To persons trained in finance, risk is characterized by a higher expected return, so that approach is applied to investment risks. In fact, both are true, and both are reflected in the cost of capital framework.

Stochastic Techniques and Liability Valuation

One of the arguments against the cost-of-capital framework for MOCE has been that it requires stochastic-within-stochastic projections for valuation. That may be a conceptually consistent approach, but as a practical matter, cost-of-capital margins can be calculated in a deterministic valuation.

The appropriate place for stochastic modeling is in the determination of capital requirements. Once capital requirements are determined, they can be converted into factor-based approximations. Many insurers routinely do this when developing their own capital targets for management purposes. A cost-of-capital MOCE can be calculated by taking the present value of periodic

cash flows equal to the projected factor-based capital amount multiplied by a cost-of-capital rate. When that is done, there is no need for stochastic valuation; all stochastic analysis can be focused on developing capital requirements.

CONCLUSION

I am an actuary, and my college degree is in actuarial science. While I work in the insurance business, I consider myself at least partly a scientist and try to follow scientific principles. One of those principles is to have a theory or conceptual framework that I apply consistently. Such a theory must be consistent with and help explain many of the things I observe in the financial environment. Once I accept such a conceptual framework, I use it when explaining my work to nonactuaries. That requires that I do my work in a manner consistent with the conceptual framework.

As discussed in this article, the cost-of-capital conceptual framework explains many things. The recent evolution of financial reporting requirements has opened the possibility of using this framework more directly in the future, but the current state of debate is riddled with competing concepts and conflicting points of view, especially between companies writing short- and long-term contracts. The cost of capital can be a consistent underlying framework. When properly understood, it can explain and resolve the conflicting points of view. I hope this article helps build such understanding. ■



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Profit Levers Under IFRS 17

By Hui Shan and Darryl Wagner



With the IFRS 17 effective date coming closer, most insurance companies have started or nearly completed their financial impact assessment to understand the transitional impact and how profit will emerge under the new global insurance accounting standard. While we all know it is a slippery slope to begin with a desired outcome in mind when making accounting decisions in the financial reporting world, it is necessary for management to understand the levers that drive profits and what to anticipate. That way, management can make informed and reasonable decisions regarding acceptable interpretation and justifiable practices. After all, as humans, we rarely make a choice in our life without consciously or subconsciously evaluating the potential consequence, even though that choice may be the only option given the circumstance.

In this article, we discuss three main profit drivers: contractual service margin, risk adjustment and financial risk. The discussion is focused on the insurance service result on the IFRS 17 statement of comprehensive income.

CONTRACTUAL SERVICE MARGIN

Given the prominence of the allocation or release of the contractual service margin (CSM) in anticipated IFRS 17 profit patterns under the general measurement model, the CSM naturally tops the list of profit levers.

For inforce business, the established CSM amount upon transition sets the tone for the emergence of future profits. The determination of the opening balance sheet varies by the transition approach. Under the full and modified retrospective approaches, the CSM is established for the inforce block as if IFRS 17 had been applied since the inception (with simplifications under the modified approach). Under the fair value approach, the CSM is established as the differential between the fair value and the fulfilment cash flows as of the transition date. To the extent that the fair value (measured as a liability) is higher, especially for business with rich guarantees where market participants would likely demand a level of compensation higher than that under a current value framework, the CSM may eat into equity upon transition. In this case, the erosion of equity translates into increased release of profits into future profit and loss (P&L) as the CSM is released over time.

For new business, the CSM is set up at inception to eliminate profit. If positive, it represents the deferred profit liability that can be released over time into P&L. The CSM is released to reflect services provided during each period and is unlocked or adjusted for changes in fulfilment cash flows that relate to future services.

By design, the IFRS 17 profit pattern is mostly driven by the movement of the CSM, which in turn is driven by multiple methodology decisions and technical calculations. These decisions and calculations include (but are not limited to):

- Transition approach that determines the opening CSM.
- Unit of account, since the granularity of the contract grouping will surely impact the calculations around the CSM.
- The choice of coverage units, which determines how the CSM is released over time.
- The sequence of the CSM calculation; the subsequent measurement of the CSM involves a number of components, including interest accretion, changes in fulfilment cash flows that relate to future services, release of the CSM to reflect services provided, the effect of contract additions, modification and derecognition, and the effect of currency exchange differences. How to handle the sequence of these elements in the modeling will affect the CSM balances.

As noted, for any reporting period, the CSM is adjusted for changes in fulfilment cash flows that relate to future services, such as updates of future nonfinancial assumptions. This adjustment, to the extent the CSM can absorb the impact, offsets the P&L impact due to changes in fulfilment cash flows, thus creating a neutral impact on P&L during the current reporting period. The unlocking adjustment to the CSM will then be subsequently released into future periods as services are provided.

RISK ADJUSTMENT

Under the general measurement model, the risk adjustment (RA) is remeasured at each reporting period, and the movement is recognized in P&L for the portion of the change that relates to the coverage period expired in the reporting period. The other changes in the RA will be reflected in the unlocking adjustment of the CSM, which as described above would be a neutral impact to P&L. In addition, the portion of the RA changes that relate to incurred claims is also reported in P&L.

At the inception of insurance contracts, the determinations of the RA and the CSM are connected in order to arrive at a no-profit situation. If a company targets a high confidence level for the RA, that would lead to a smaller CSM and vice versa. That time zero geography has an impact on the future profit emergence, because the RA and the CSM are not released into income in a consistent fashion. In light of this connection, evaluating the RA and the CSM together in analyzing the emergence of future profits would be logical and would provide valuable insights. It was noted that the CSM is the most prominent part of IFRS17 profit patterns. However, it may not hold true in certain situations. For example, for certain general and health insurance contracts that have claims beyond the coverage period, the CSM will have run off by the end of the coverage period, but the RA will continue to be measured. In this case, the RA will become the sole lever that drives P&L emergence beyond the coverage period.

IFRS 17 sets out five qualitative principles (paragraph B91) to guide RA methodology choices but does not prescribe any techniques to quantify the RA, including how to aggregate the RA for reporting entity-level disclosure or allocate the effect of diversification to a group of contracts. The methodology decisions around the RA will certainly impact the resultant release of the RA into P&L. As analyzed in the September 2018 issue of *The Financial Reporter*¹, the choice of the RA technique, whether a cost of capital approach or a value-at-risk approach, could result in very different profit patterns. In addition, risk mitigation approaches such as reinsurance and product de-risking that affect liability cash flows will also impact the RA.

FINANCIAL RISK

Some insurance contracts expose the insurer to financial risks in addition to significant insurance risks. Financial risks that arise from insurance contracts may include, but are not limited to, credit risk, liquidity risk, foreign exchange risk and market risk. Under the general measurement model, the effect of changes in financial risk, such as the change in discount rates, is recognized as insurance finance income or expenses, either in P&L or other comprehensive income. It does not affect the insurance service result, which is what this article is focused on. However, for direct participation contracts subject to the variable fee

approach (VFA), changes in the variable fee due to financial risks, which consist of the value of future charges less the cost of guarantees, impact the CSM. Such adjustment to the CSM is then subsequently released into insurance service result as services are provided. In addition, to the extent the company has a risk mitigation program that meets the conditions in paragraph B116 of IFRS 17, the entity may choose not to adjust the CSM for the changes in the variable fee.

CONCLUSION

The above is not an exhaustive list of levers that drive the profit signatures. Furthermore, magnitude of different profit levers will vary for different kinds of business. An impact assessment that considers possible levers is necessary for management to understand what to anticipate under the new accounting paradigm. The key benefit of performing a financial impact assessment is that it helps to identify and frame potential challenges and issues that need to be addressed in implementation. Sensitivity analyses around those levers—such as the choice of coverage units, target confidence level for the RA, the RA techniques (quantification, allocation and aggregation), and the risk mitigation program for VFA contracts, as well as experience variations and assumption unlocks—are useful to reveal how profits arise and emerge over time. Now that insurance companies are likely going to have one additional year for IFRS 17 implementation², it is in their best interest to understand the full scope of potential impacts under multiple scenarios before moving full steam ahead on the implementation journey. ■

The views reflected in this article are the views of the authors and do not necessarily reflect the views of Deloitte.



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ENDNOTES

- 1 Wagner, Darryl, Hui Shan, and Ryan Kiefer. 2018. IFRS 17 Risk Adjustment – Insights from a Practical Example. *The Financial Reporter*. September.
- 2 The IASB Board voted on Nov. 14, 2018, to propose a one-year deferral of the effective date of IFRS 17 to 2022.

NAIC Variable Annuity Reform—A Current Primer

By Zohair Motiwalla

In recent years, the use of on-shore and off-shore captive reinsurance transactions by a number of U.S. variable annuity (VA) companies—seen as a direct consequence of the complexity of the current U.S. statutory framework—motivated the National Association of Insurance Commissioners (NAIC) to determine what changes may be needed to encourage companies to recapture this business. This article provides a high-level overview of the proposed changes to the existing regulatory guidelines, the current status of the reform process, and a brief evaluation of the changes, including potential key drivers of differences in results.

BACKGROUND AND OVERVIEW OF THE PROPOSED FRAMEWORK

In early December 2017, NAIC released proposed revisions to the existing U.S. variable annuity statutory framework. These revisions were promulgated as redline updates to the existing Actuarial Guideline 43 (AG 43) and Risk Based Capital (RBC) C3 Phase II (C3P2) instructions and were the culmination of two rounds of field testing (quantitative impact studies, QIS) performed by Oliver Wyman and industry participants in 2016 and 2017 that provided much of the impetus behind the specific changes. The QIS testing itself was motivated by the industry perception that the use of captives by many variable annuity writers was a direct result of the complexity of AG 43 and C3P2. The NAIC commissioned the QIS initiative to address these concerns, to promote stronger risk management, and to consider what changes may encourage companies to recapture this business.

The NAIC proposed revisions were exposed for comment in the first quarter of 2018, which allowed industry participants, regulators and interested parties to fully absorb the redline documents. An NAIC variable annuity reform meeting on May 16, 2018, also provided a forum to render comments and feedback in person.



In late July 2018, the NAIC Variable Annuity Issues (E) Working Group (VAIWG) adopted almost all of the broad recommended changes outlined in the November 2017 AG 43 and C3P2 redline documents that were exposed for public comment, although a number of the recommendations were modestly adjusted and one recommendation was rejected (the recommendation to increase the admissibility limit for deferred tax assets pertaining to variable annuity business).

Under the new framework, the aggregate reserve is now the sum of the conditional tail expectation (CTE) Amount and the additional Standard Projection Amount, where the latter term is determined using the Standard Projection (formerly known as the Standard Scenario). While a complete description of all these components is outside the scope of this article, Figures 1 through 3 provide an overview of the proposed framework and that of the CTE Amount and the Standard Projection Amount.

Figure 1
Proposed Statutory Framework—Overview

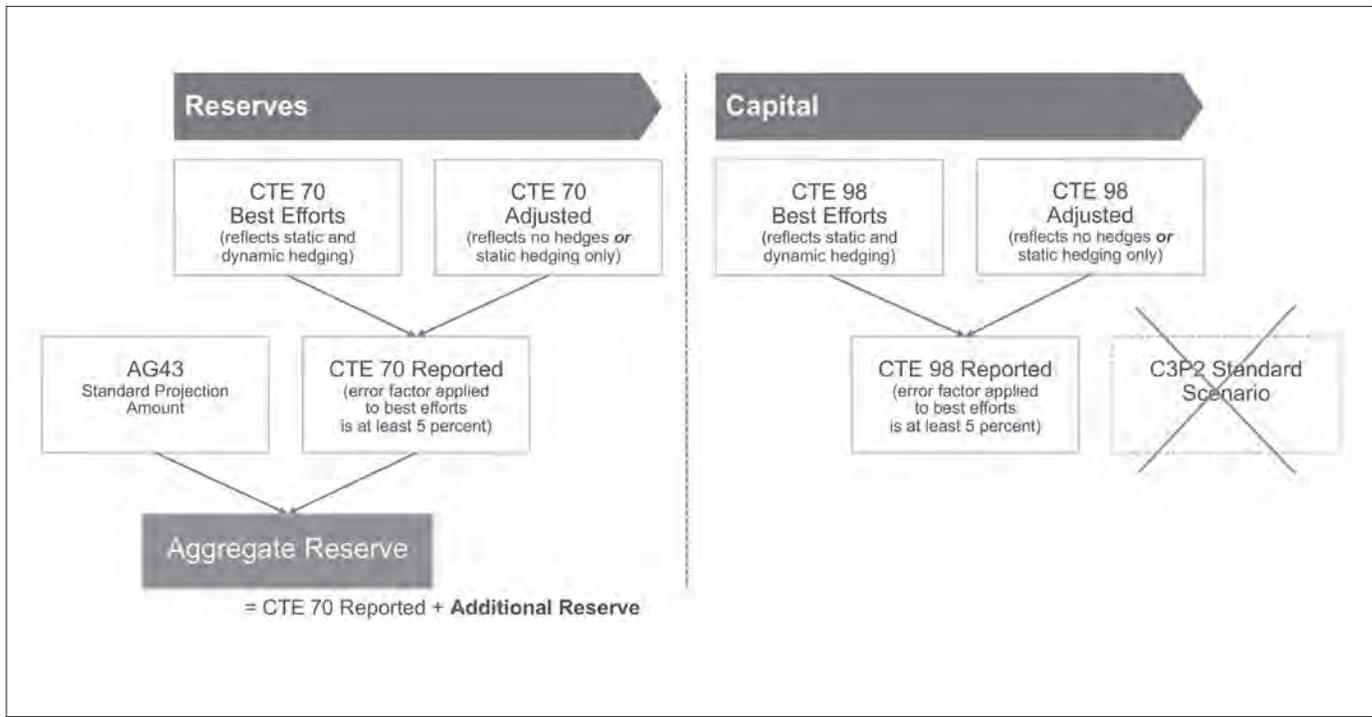


Figure 2
Proposed Statutory Framework—Overview on the CTE Amount

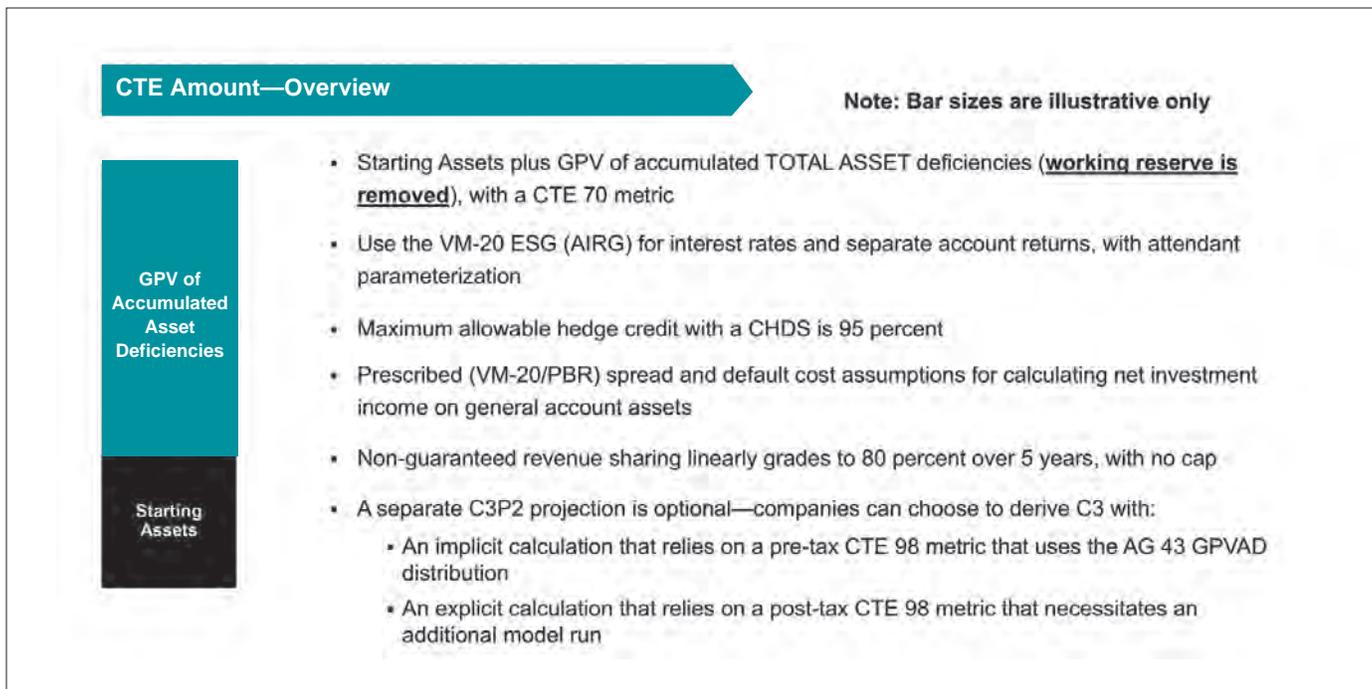
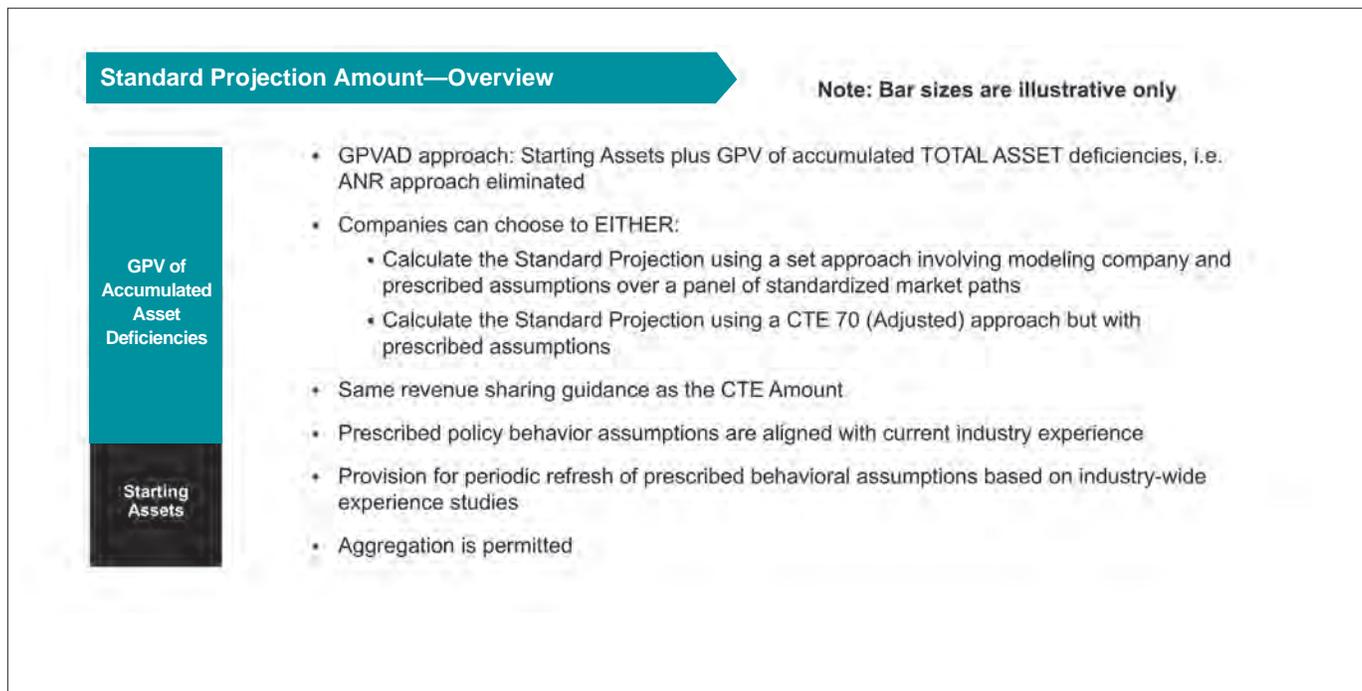


Figure 3
Proposed Statutory Framework—Overview of the Standard Projection Amount



KEY RECENT REVISIONS

At a high level, the main revisions in what the VAIWG adopted relative to the November 2017 redline documents include changes to the following:

RBC C3 Charge

- Modification of the calculation to use a CTE 98 metric (rather than a CTE 95).
- This follows from the VAIWG decision to not recalibrate the VM-20 scenario generator with 1926-2016 data.

Standard Projection

- In three years, the industry will re-evaluate the stipulation that the necessity of the Standard Projection as a binding element of the calculation (rather than simply a disclosure item).
- Removing the need for companies to obtain regulatory approval if choosing to calculate the Standard Projection using a CTE 70 Amount (Adjusted) approach with prescribed actuarial assumptions.
- Regulatory approval is still required to switch between this approach and the approach that relies on standardized market paths and both company and prescribed assumptions.

Other

- Removal of the affiliated/nonaffiliated distinction for nonguaranteed net revenue sharing income.
- Modifications to a number of disclosure requirements needed for the actuarial memorandum.

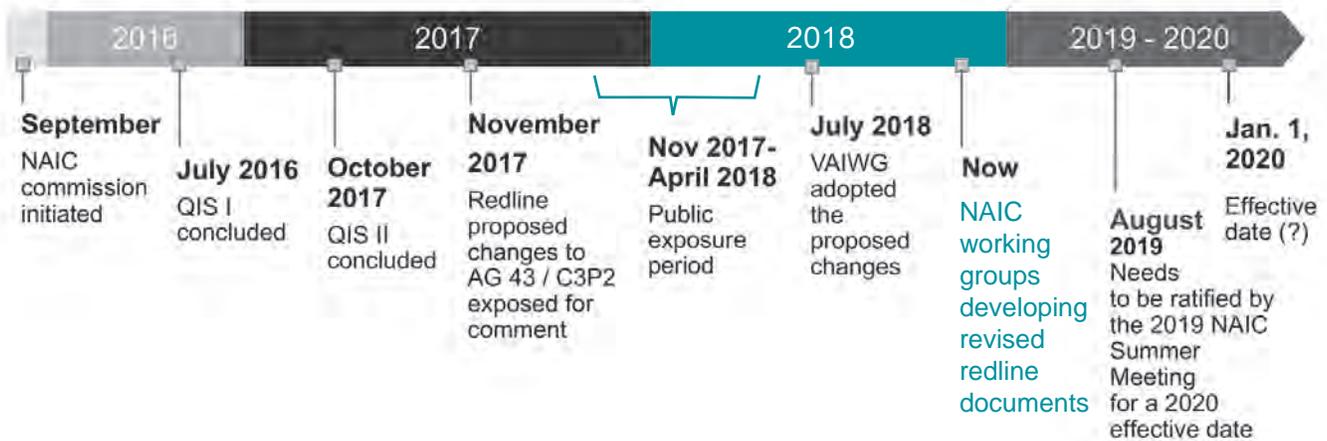
CURRENT STATUS

While NAIC has agreed upon the above revisions, these revisions have not yet been incorporated into a formal rewrite of the November 2017 redline documents. At the current time, implementation assignments to formally update said documents (in other words, to create a final set of regulatory instructions for AG 43 and, by extension, VM-21 of the Statutory Valuation Manual) have been assigned to the appropriate NAIC working groups and task forces.

New updated redlines will be exposed publicly piecemeal—the entire set will undergo review by the Life Actuarial (A) Task Force and Life Risk-Based Capital (E) Working Group, possibly in early 2019.

A timeline of the entire NAIC VA reform process is provided in Figure 4.

Figure 4
NAIC VA Reform Timeline



While the effective date in the final set of regulatory instructions is anticipated to be for valuation dates subsequent to Jan. 1, 2020, for this to occur, all technical wording changes to the instructions need to be approved at the highest level of the NAIC by the Summer Meeting that is to take place in early August 2019.

Should this date be missed, it is not clear whether the Jan. 1, 2020, date will be revised. Note that companies can also choose to apply these changes for the valuation on Dec. 31, 2019.

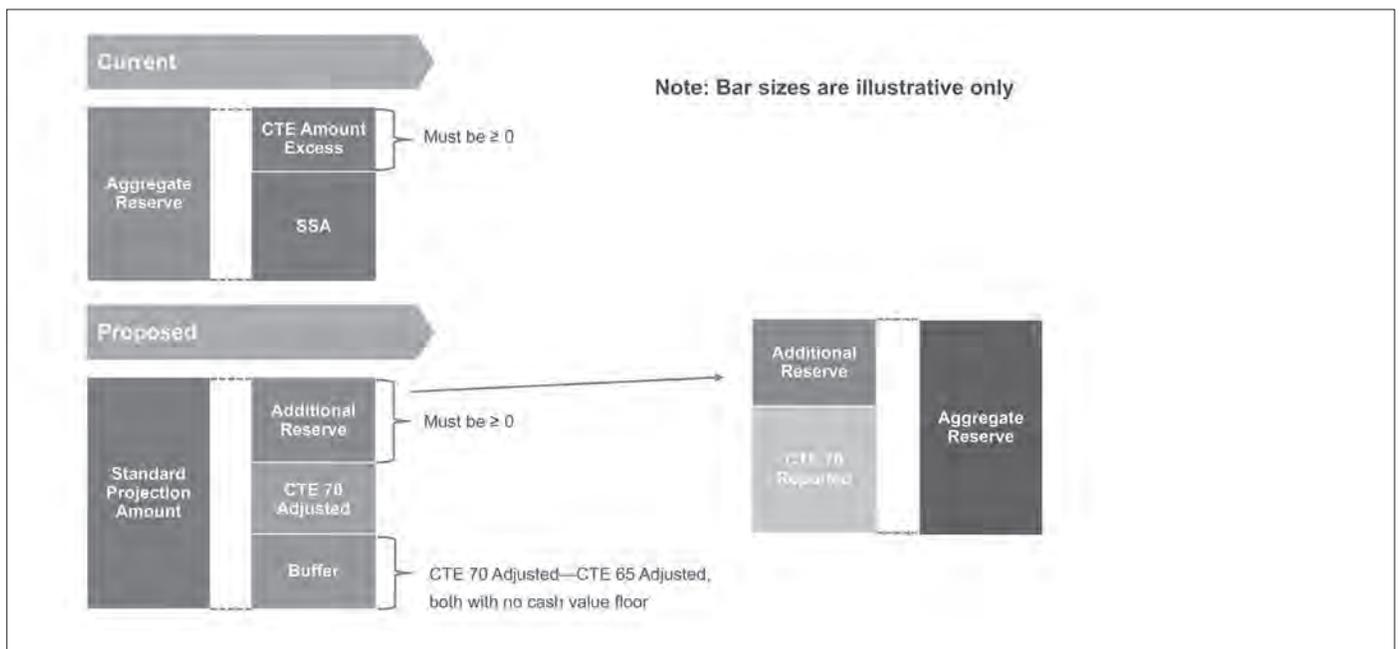
While the new framework applies to all existing variable annuity business as of the effective date and any business issued

thereafter, the final set of regulatory instructions has provision for an optional phase-in or grading of the new statutory framework over a three-year period, with a longer phase-in period (potentially up to seven years) allowed subject to regulatory approval. The grading may also be terminated prior to the end of the declared phase-in period, with the full statutory reserve under the new framework applying in such cases.

A HIGH-LEVEL EVALUATION OF THE PROPOSED FRAMEWORK

Figure 5 compares the building blocks for both the current (i.e., status quo) and proposed statutory reserving frameworks.

Figure 5
Comparison of Statutory Frameworks



Note that the additional reserve, defined to be the Standard Projection Amount less the CTE 70 (Adjusted) less a “Buffer” amount, must be nonnegative.

The following are potential positives associated with the proposed framework:

- Aligning the Standard Projection Amount with the CTE Amount as a greatest present value of accumulated asset deficiencies calculation, with aggregation permitted.
- Removing the C3P2 Standard Scenario (which was usually never binding for companies) and ironing out inconsistencies between the current reserving and capital frameworks for the stochastic calculation.
- Encouraging hedging through removal of the working reserve, potentially higher hedge credits and more favorable statutory hedge accounting treatment.
- Aligning the asset assumptions for general account modeling with that used in VM-20.
- Aligning the economic scenario generator for separate account returns and interest rates with that used in VM-20.
- Reducing noneconomic volatility in the RBC ratio and the impact of voluntary reserves (both through modification of the C3 capital charge formula).

The following are potential risks and/or difficulties associated with the proposed framework:

- The complexity of the Withdrawal Delay Cohort Method under the Standard Projection and the potential increase in run-time that may result. (A full-blown approach that is consistent with the instructions can result in liability in-force record counts increasing by a factor of six to 10, which can be challenging from a run-time perspective).
- Forecasting future statutory reserve amounts, as would be required under a pricing or business plan projection, due to the increased complexity of the Standard Projection.
- Determining the greatest actuarial present value at every time step under the Standard Projection.
- Consideration of the asset assumptions for general account modeling for those companies that have not previously explicitly modeled general account assets from first principles.

- Should the “nondefault” methodology be chosen in any specific area where choice is allowed (e.g., modeling the CTE 70 Amount Adjusted with prescribed assumptions for the Standard Projection), there is an added burden of calculating reserve requirements under the default methodology as a disclosure requirement.

- Additional disclosure requirements around the Standard Projection, CTE Amount and hedging.

OBSERVATIONS AND DRIVERS OF POTENTIAL DIFFERENCES IN RESULTS

For practitioners, specific items that may impact results relative to the current statutory framework include the following:

- Using an economic scenario generator (and underlying parameters) different to the VM-20 economic scenario generator. For example, some companies may be using a mean reversion assumption for interest rates that is materially different to that used in the VM-20 generator (both the target mean reversion and the “speed of reversion,” or time horizon over which interest rates revert to said target).
- Company policyholder behavior assumptions relative to the prescribed policyholder behavior assumptions for the Standard Projection.
- Using assumptions for general account asset modeling different to the prescribed VM-20 assumptions.
- The choice of methodology that is inherent within certain aspects of the new framework.

With respect to the last bullet, particularly important examples of choices in methodology include the formulation of the Standard Projection Amount—as either using a hybrid approach with both company and prescribed assumptions over a panel of standardized paths or a CTE 70 Amount (Adjusted) calculation with prescribed assumptions—and potential simplifications to the approach used to apply the Withdrawal Delay Cohort Method, particularly with regard to discarding cohorts. Modeling the Withdrawal Delay Cohort Method according to the instructions may require a significant effort and can be operationally challenging¹.

Another example of choice includes the approach to the RBC C3 charge calculation, for which companies can either choose to use an implicit approach (leveraging the distribution of AG 43 results, with a subsequent tax adjustment) or an explicit approach (that requires a separate model run with taxes included).

CONCLUSIONS

Despite the final set of regulatory instructions not being ready until early 2019, companies can use the existing November 2017 redline documents as a comprehensive starting point. Accordingly, with the effective date of the new statutory framework potentially on Jan. 1, 2020 (assuming ratification of the final set of regulatory instructions at the 2019 NAIC Summer Meeting) and given the scope/breadth of changes, it is critical that companies devote sufficient preparation time to:

- Implement model modifications to reflect the new framework.
- Perform impact testing of the new framework.
- Make decisions around areas of the requirements that allow a choice of methodology, as outlined above (with said decisions made on the basis of computational tractability and/or financial impact).
- Allow for peer review, independent validation and regression testing.

- Consider the additional disclosure items that are required in support of the Standard Projection and hedging.

It is also important for companies to carry out the above in order to provide context in discussions with third parties, such as auditors, regulators, rating agencies and/or reinsurance companies, with respect to chosen methodologies and the financial impact of the changes. ■



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ENDNOTE

- 1 While the instructions allow for discarding some cohorts, companies may also wish to test the impact of removing cohorts associated with off-risk ages, stipulating a maximum number of cohorts or other reasonable simplifications that do not materially impact results.

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VA Reform: Assessment and Implications

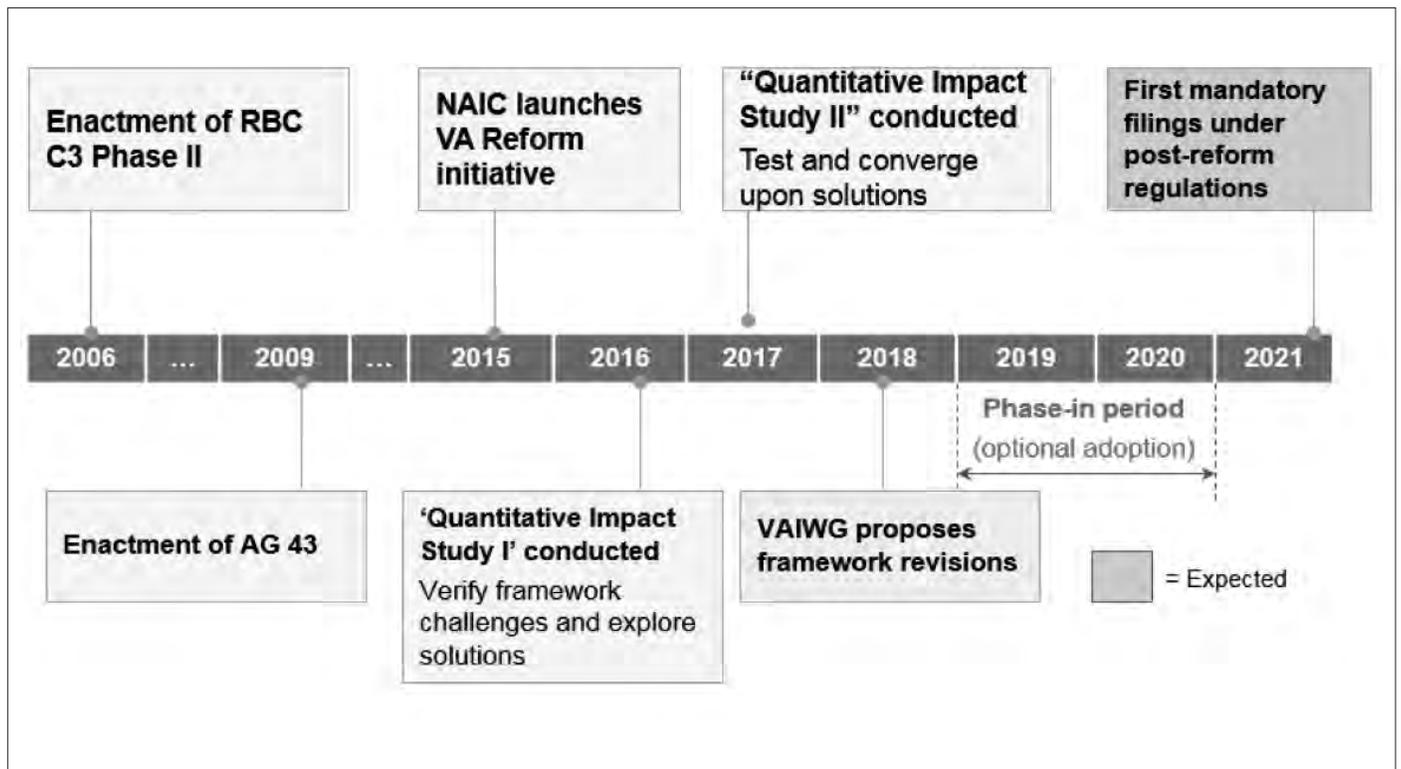
By Aaron Sarfatti

The variable annuity (VA) industry remains an engine of growth for the U.S. life insurance industry, with more than \$2 trillion in industry assets under management and annual premiums exceeding \$100 billion. While originally designed as a vehicle for tax deferred accumulation, a sizable portion of VA assets have riders attached to the policies that create exposures—in many instances material—to risks arising from capital markets, policyholder behavior and mortality. The regulations that guide the determination of the reserves and capital

associated with these guarantees materially affect the balance sheet and capital management practices of VA manufacturers.

In 2015, in response to a proliferation of captive reinsurers designed to help companies manage VA risk and capital, the National Association of Insurance Commissioners (NAIC) embarked on an approximately three-year initiative to reform the Actuarial Guideline 43 (AG 43) and C3 Phase II (C3P2) regulations that establish standards for setting VA reserves and capital. The principal NAIC objective was to encourage captive recapture—with subobjectives to (a) enable companies with prudent risk management to achieve greater capital stability and (b) maintain or enhance the prudence of regulatory standards. In May 2018, following two quantitative impact studies spearheaded by Oliver Wyman, the Variable Annuities Issues Working Group (VAIWG) recommended revisions to the AG 43 and C3P2 standards that, while preserving the general structure of the calculations, represent a sweeping overhaul of the calculation standards. Figure 1 shows a timeline of past and expected changes to VA reserve and capital regulations.

Figure 1
Timeline of VA reserve and capital regulations
2006-2021



I was the lead partner at Oliver Wyman supporting the NAIC initiative. The remainder of this article reflects my personal analysis of the reform initiative.

SUMMARY OF MAJOR RECOMMENDATIONS

The VAIWG recommended 27 revisions to the AG 43 and C3P2 guidelines. The most material pillars of these recommendations are summarized below.

Overhaul of the Standard Scenario

The existing AG 43 and C3P2 standard scenarios are supplanted by a Standard Projection (SP) featuring (a) prescribed policyholder behavior and mortality assumptions derived from industry experience and (b) a calculation structure aligned fully with that of the stochastic calculation. The stated objective of the new SP is to govern company model choices such as policyholder behavior assumptions.

Prescribed use of the VM-20 Scenario Generator

The current framework permits companies to determine the capital markets scenarios used in the stochastic projections, subject to a limited set of calibration criteria for select equity returns. The reformed framework prescribes all companies to use the scenario generator required by VM-20 (and with common input parameters), which at the time of this article is a generator authored by the American Academy of Actuaries.

Alignment of Reserve and Capital Calculations

The current framework derives reserves and total asset requirements (and hence risk-based capital, or RBC) using two distinct calculations: reserves at conditional tail expectation (CTE) 70 from one distribution of scenario projections and capital at the CTE90 of a separate distribution. The revised framework derives reserves and capital from the CTE70 and CTE98¹ of the same distribution.

Enhanced and Targeted Disclosures

The current framework requires several more general disclosures regarding inputs to or properties of the company projections. The revised framework prescribes targeted disclosures intended to enhance regulator knowledge of specific potential vulnerabilities of company projections; for example, companies will be required to disclose the magnitude of the “credit” to reserves and capital realized by projected hedge rebalancing.

SUCCESSSES OF THE REFORMS

The VA reforms constitute a de facto overhaul to the calculations, particularly with respect to company incentives and the quality of signals to regulators about the financial condition of companies. The most material successes are summarized below.

Greater Capital Stability for Prudent Risk Managers

Four distinct calculations can bind insurer reserve or capital in the current framework, and each contains different (oftentimes materially so) sensitivities to the capital markets environment. These conflicting signals regarding a company’s market exposure greatly complicate company hedge programs and effectively preclude capital stability across market environments, a requirement for many companies to participate in insurance markets.

The revised framework reduces to two and fully aligns the component calculations, with any residual variations in market risk sensitivity arising from matters of regulatory prudence, such as prescribed versus company policyholder behavior assumptions. Combined with a parallel Statutory Accounting Principles (E) Working Group initiative to expand hedge accounting practices, the alignment of capital market sensitivities in the new framework addresses the most oft-cited motivation for use of VA captives, that is, lack of capital stability post-hedging.

Harmonization of Capital Markets Scenarios

A 2015 Oliver Wyman survey at the outset of the VA reform initiative revealed wide disparities in company capital markets scenarios, particularly for interest rates, where observed company variations included:

- Long-term mean interest rates—from then-present, long-term U.S. Treasury rates (~3.0 percent) to nearly 7.0 percent.
- Speed and strength of mean reversion—from companies with gradual reversion to others where the preponderance of projected scenarios included sharp upward movements in long-term interest rates within 10 years.

For a class of long-dated GMxB liabilities where interest rates are arguably the most significant risk factor, granting companies the ability to set interest rate distributions issues a de facto license to set reserve and capital levels—a regrettable regulatory property itself, let alone the obvious preclusion of any uniform regulator assessment of capital strength across companies. The harmonized scenarios within the reform enable regulators to express a uniform appetite for capital markets risk across the industry.

Governance of Actuarial Assumptions

Error in actuarial assumptions, and particularly policyholder behavior, is among the most material risk to issuers of variable annuities, with analogs to long-term care via both the (i) long-dated, complex nature of many GMxB assumptions and (ii) the poor track record of many industry participants in assumption unlock experience.



The current framework attempts to govern policyholder behavior via the Standard Scenario, but these assumptions were set both (a) prior to the emergence of valuable industry experience and (b) without sufficient regard to policyholder economic incentives in many guarantee products. Moreover, whatever governance value the Standard Scenario affords through its prescribed assumptions is distorted by the sharp variations in its calculation approach relative to that of the stochastic calculations.²

While imperfect by dint of a lack of a crystal ball into the future, the revised prescribed assumptions in the Standard Projection (a) integrate substantial relevant industry experience and (b) better reflect policyholder economic incentives for assumptions not yet credibly informed by experience.

Elimination of the RBC Distortion Caused by the Use of Voluntary Reserves

A common industry practice is for companies to employ so-called “voluntary reserves” for variable annuities, setting the amount of the voluntary reserve such that total reserves approximately equal the C3P2 capital requirement. While the intent of many companies engaged in this practice is to stabilize capital given the mismatching signals, a poorly understood byproduct is to distort RBC ratios higher because the C3 charge under C3P2 is small or zero (the latter leading to an infinite standalone VA RBC ratio). The consequence of such a ratio is to weaken the signal value of the RBC ratio as a measure of company financial health. The revised framework, by use of the scalar to CTE98,

sharply reduces the distortionary effect of any use of voluntary reserves should any companies continue to use them.

POTENTIAL LIMITATIONS OF THE REFORMS

Given the magnitude of the approved revisions (all but one of the Oliver Wyman recommendations were substantially agreed to) and momentum to implement, my overall impression is that the NAIC VA reform initiative will be a success. Companies with prudent risk-management practices and sound assumptions should experience smoother capital and be able to simplify and streamline risk-management and hedging practices. However, three areas of concern remain.

Lack of Prudence of the VM-20 Interest Rate Scenario Generator

The VM-20 scenario generator is designed to provide a “real world” perspective of potential future capital markets environments along with a prudence margin. While the equity generator (and associated calibration criteria) was hotly debated during the QIS and, in my view, is lacking a sufficient prudence margin³, the most material questionable characteristic of the generator is its failure to produce sustained low, long-term interest rates, such as those observed in Europe over much of the past decade (or in the United States in 2016).

The interest rate generator is designed such that, at low interest-rate levels, the mean reversion strength (toward higher interest rates) overwhelms potential further interest rate

declines due to volatility in the random simulation. The consequence is a generator that, as of year-end 2017, did not produce a single scenario (out of 10,000), where the average 10-year interest rate is below 1.5 percent. The impact is that companies do not have to capitalize to sustained low interest-rate scenarios; therefore, business models predicated on a levered bet against sustained low interest-rate environments can attract capital and thrive, distorting market pricing and exposing the NAIC and life industry overall to financial losses and reputational harm in the event a sustained low interest-rate condition is realized.

The VAIWG chose not to recommend any revisions to the VM-20 scenario generator within the confines of the VA reform process, electing to defer the question of its revision. Unequivocally, the revision to or replacement of the VM-20 scenario generator should be a top priority for the NAIC, because the “sustained low interest-rate peril” will loom over the variable annuity industry until such revisions are instituted.

Uniform Regulatory use of the Enhanced Disclosures

Several aspects of the projections—such as Clearly Defined Hedge Strategies, complex but impactful components of company models—were deemed too complicated to govern via explicit guidelines. Instead, governance of these projection components relies exclusively on regulators’ diligent examination and questioning of results through enhanced disclosures prescribed as part of the reforms. The NAIC should ensure that regulators from all states uphold the commitment to examine these disclosures. Failure to do so would introduce substantial gaps in regulatory oversight.

Failure to Refresh Prescribed Policyholder Behavior Assumptions

As noted previously, the prescribed policyholder behavior assumptions in the new Standard Projection contain many improvements over existing prescriptions. However, many material assumptions still lack credible experience (either existence of data or the interest rate environment attending the data), and in these instances, judgment was applied with respect to the degree to which policyholders act according to their economic interests. Further data will continue to emerge for material assumptions; and updates to the assumptions, whether to strengthen or relax the prescriptions, will be a valuable use of regulatory resources in light of the tens of billions of dollars of capital dependent on relatively minor revisions to these

assumptions. Moreover, expanding the data sets to include non-retail GMxB business (the Oliver Wyman QIS study focused on retail GMxB business) should be allowed for companies that can demonstrate material exposure to such businesses.

CONCLUSION

The NAIC deserves considerable praise for undertaking the VA reform initiative, and I view the initiative unambiguously to have been a worthwhile endeavor. However, further work is required to complete (e.g., VM-20 generator overhaul) and sustain (such as refresh prescribed assumptions) the reforms. Moreover, the NAIC should extract and apply the learnings from this initiative—such as the needs to harmonize market assumptions and govern actuarial assumptions—to similar reform initiatives across the industry to promote soundness in both risk-management practices and business models. I would also like to thank the NAIC for granting me the privilege to render (with the support of my erstwhile colleagues at Oliver Wyman, in particular the peerless Peter Tian) the most significant industry contribution to date of my career. I hope this perspective on the VA reforms is helpful for regulators and interested parties alike, and I look forward to the continued health of the VA industry. ■

This article presents the author’s views of the NAIC VA reserve and capital reform initiative. These views are not sanctioned by either Oliver Wyman or AXA Equitable, the author’s current employer.



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ENDNOTES

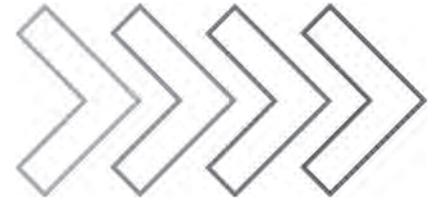
- 1 The revised framework sets undiversified C3 RBC equal to a scalar (initially 25 percent) of the difference between CTE98 and CTE70.
- 2 The current Standard Scenario uses the accumulated net revenue construct while the stochastic calculation uses the greatest present value of accumulated deficiencies construct. These two constructs differ sharply in the discount rate, reflection of hedging and recognition of certain liability cash flow items.
- 3 The Academy Generator, at the time of this article, produces a ~7.6 percent compound mean long-term expected large cap equity return where returns are entirely unrelated to the returns on risk-free assets and with an average annual lognormal volatility between 14 to 15 percent.

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VM-20 PBR for Life Insurance—Survey Highlights

By Emily Cassidy and Hans Harris

The principle-based reserving (PBR) model is a significant change to the life insurance regulatory framework. As the three-year grade-in period comes to an end and the Jan. 1, 2020, mandatory adoption date approaches, companies are actively preparing for (or at least contemplating) more complexities surrounding their processes, assumption setting, modeling efforts and information systems.

In order to benchmark the current adoption and implementation progress of the Valuation Manual (VM) Section 20—PBR for Life Insurance, in September 2018, KPMG surveyed 20 companies. The survey questions were broken down into four broad categories: (1) liability assumptions and margins; (2) asset and liability management (ALM), asset assumptions and margins; (3) reinsurance; and (4) modeling/methodology. This article summarizes the survey's key findings.

LIABILITY ASSUMPTIONS AND MARGINS

Adding more rigor to the process of setting, governing and documenting margins is top of mind for the responding companies. The VM-20 framework states that companies shall include margins to provide for adverse deviations and estimation error in the prudent estimate assumption for each risk factor that is not stochastically modeled or prescribed. Explicit margins on liability assumptions are a new concept for statutory reserving for life insurance. Margins can be a challenge, and when not prescribed, like mortality, companies must reflect prudent estimates based on their own experience. In addition, the process and ultimate margin must be documented in the VM-31 report. Most respondents have indicated that formal policies for setting margins are under development. Respondents also indicated that the use of sensitivity testing will be core to their process of determining margins on assumptions. Because any changes in margins from period to period will create volatility and the need to explain results, development of a formal, repeatable process will aid in driving appropriate consistency in setting margins on an annual basis.

With regard to anticipated policyholder behavior, VM-20 generally requires the use of dynamic modeling or other scenario-dependent formulation. The majority of respondents will apply dynamic adjustments to the lapse assumption, which is consistent with the principles-based valuation of variable annuities. Just under half of the respondents indicated that they would vary lapse margins by duration, one-fourth will keep lapse margins constant, and the rest have yet to decide. We expect that the lapse assumption and appropriateness of dynamic multipliers is an area that the industry will need to monitor as experience is gained and leading practices emerge.

For flexible premium products such as universal life with secondary guarantees, renewal premium assumptions are typically challenging for companies to quantify, and premium persistency experience studies are often unsophisticated or emerging. Of the respondents who sell these flexible premium products, about 35 percent indicated that they would apply a constant margin to renewal premiums on all scenarios. Given the disclosure requirements pertaining to premium payments, this is an assumption that companies will need to thoroughly document and have solid reasoning to support.

ASSET LIABILITY MANAGEMENT, ASSET ASSUMPTIONS AND MARGINS

The complexity in the approach to asset modeling for both valuation and projections lends itself to some operational challenges. About half the respondents indicated that they intend to use a single integrated model that projects assets and liabilities instead of standalone asset and liability models. For others, presumably, modeling systems have not yet transformed to a state where integrated modeling is easily accomplished. Similarly, about half the respondents indicated that they will use either company-based or market data in the modeling of economic assumptions.

Under the guidance of VM-20, “model segment” refers to a group of policies and associated assets that are modeled together to determine the path of net asset earned rates. Under each model segment, companies select starting assets equal to the estimated value of modeled reserve plus the pre-tax interest maintenance reserve. The starting asset value can be determined using direct iteration of actual assets or an estimate that is within 2 percent of the modeled reserve, i.e., collar approach. About 80 percent of respondents indicated they will apply the 98 to 102 percent collar to determine the starting assets for the combined model segments. The collar approach is simpler and reduces the additional run time that PBR will require. If the starting assets of the combined model segments are less than 98 percent, or greater than the larger of net premium reserve (NPR), or 102 percent of final modeled reserve, the company



will need to provide documentation that the modeled reserves are not materially understated.

REINSURANCE

Reinsurance plays important roles to insurers, which include sharing risk, sharing expertise, volatility management and assumption setting. Seventy-five percent of respondents indicated that they will either use the same amount of reinsurance or use the same types of reinsurance with the adoption of PBR. Despite the intention that PBR would reduce reliance on reinsurance captives, only 20 percent of respondents indicated that they will stop using captives. This seems to indicate that the cost/benefit analysis shows that PBR is not necessarily giving enough reserve relief to offset the benefit of using captives. The effects of tax reform are also likely playing a role in these decisions.

Reinsurance impacts all three reserve components under PBR. For reinsurance on a yearly renewable term (YRT) basis, the NPR is reduced by the net amount at risk. Most respondents did not yet have conclusive results on whether the reinsurance reserve credits for YRT arrangements would be positive or negative for both term and universal life products. Half the respondents will project nonguaranteed YRT premiums with either the current scale or addition of a margin.

MODELING/METHODOLOGY

The VM-20 framework is multifaceted and involves modeling of several reserve components, which can be a technology challenge. Most respondents indicated that they plan to use a single software platform to model all of the VM-20 reserve components.

Slightly more than half the respondents will perform a full stochastic calculation at each quarterly valuation period in determining the stochastic reserve component. For respondents who indicated that they would perform a stochastic calculation, about 80 percent will use more than 500 scenarios, with over half indicating that they would use more than 1,000 scenarios.

The deterministic and stochastic reserve may be calculated no earlier than three months before the valuation date, provided an appropriate method is used to adjust reserves to the valuation date. However, company data used in the determination of prudent estimate assumptions are not subject to the three-month limitation. Slightly more than 50 percent of respondents indicated that they would use asset information with a lag, while only 20 percent indicated that all data would be as of year-end.

SUMMARY

Based on the survey results, we observed the following:

- Companies are faced with multiple new regulatory requirements and accounting change initiatives over the next few years. The respondents to the survey are primarily delaying adoption as long as possible, with nearly 70 percent responding that they would adopt in 2019 or 2020.
- One of the original intentions of a principle-based framework was to reduce reliance on reinsurance captives. However, the results of this survey indicate that companies are still evaluating their planned use of reinsurance. Only a small percentage responded that they would stop using captives.
- Explicit margins on liability assumptions is a new concept for statutory reserving of life insurance. The majority of companies state that a formal policy for setting margins is under development and that margins will primarily be set using sensitivity testing rather than a more complex statistical technique.

- A fully integrated asset-liability model increases the complexity of the valuation process. About half of the participants indicate they plan to use a single integrated model that projects assets and liabilities. However, more than 80 percent of respondents plan to use the simplification of the 2 percent collar approach to setting starting assets rather than a direct iteration approach. ■

The views expressed in this article are those of the survey participants (on an anonymous basis) and do not necessarily reflect the views of KPMG, nor are they intended as methods of regulatory or tax compliance.



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PBR Simplified Methods Project

By Mark Birdsall

Section 2G of Valuation Manual Section 20 (VM-20) states the following: “A company may use simplifications, approximations and modeling efficiency techniques to calculate the net premium reserve (NPR), the deterministic reserve and/or the stochastic reserve required by this section if the company can demonstrate that the use of such techniques does not understate the reserve by a material amount, and the expected value of the reserve calculated using simplifications, approximations and modeling efficiency techniques is not less than the expected value of the reserve calculated that does not use them.”

The Society of Actuaries (SOA) funded a research project to explore possible methods of approximating the VM-20

Stochastic Reserve for Principle-Based Reserves (PBR). The PBR Simplified Methods research team consisted of Steve Strommen, Brian Hartman, Chris Davis, Therese DeWitt and myself. The project was designed to provide four deliverables: 1. a multi-risk scenario generator (MRSG) for all material assumptions; 2. objectivity measure(s) for material best estimate assumptions; 3. an actuarial report detailing the results of the project; and 4. recommendations for approximations techniques by product type, together with a sample regulatory demonstration.

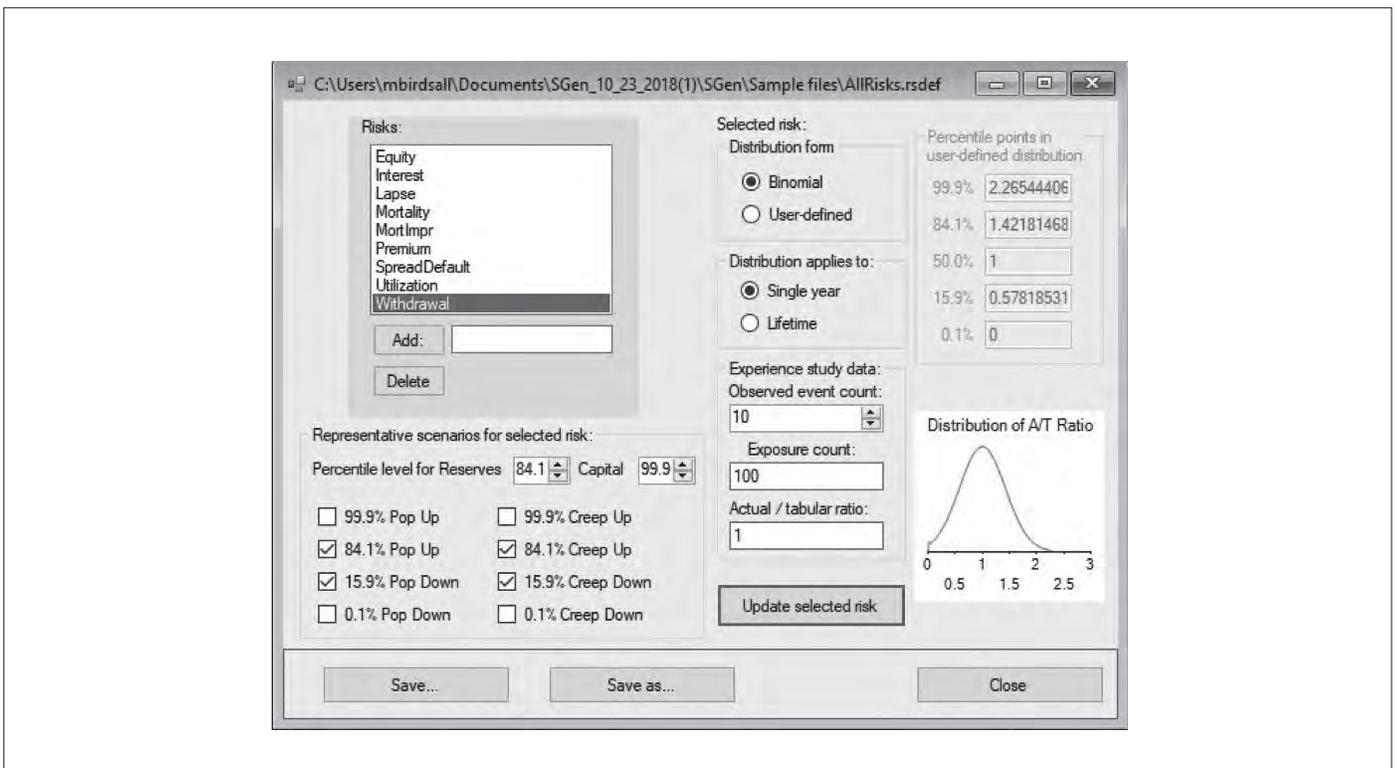
The team has provided these deliverables to the SOA. The project report, including a sample regulatory demonstration, and the MRSG will be available on the SOA website.

This article provides a brief description of deliverables 1, 2 and 4, including testing results with respect to the two recommended approximation methods for a sample universal life with secondary guarantees (ULSG) product.

MULTI-RISK SCENARIO GENERATOR

The MRSG produces actual rates for the equity and interest risks and actual-to-expected (A/E) factors (also called “actual-to-tabular factors” or A/T) for the other material risks. The user first creates a risk definition file.

Figure 1
Defining the Risks



In the upper left-hand corner of Figure 1 (pg. 25), the user starts with the equity and interest risks and adds material risks determined by sensitivity testing, actuarial judgment or other methods. For the equity and interest risks, the scenarios are generated using the SOA/AAA economic scenario generator embedded in the MRSG.

The probability levels for the shocks to the material risks are indicated in the lower left-hand corner, which reflect extreme scenarios that could be used to develop target surplus (e.g., 99.9 percent and 0.1 percent). The 84.1 percent and 15.9 percent scenarios could be used to represent moderately adverse scenarios. Note that the user may input respective percentile levels.

“Pop Up (Down)” and “Creep Up (Down)” are different methods for producing the scenarios at the selected probability levels. For some risks, such as lapses, the adverse direction is not always clear, so deviations in both directions are tested.

The pop and creep scenarios differ in the pattern of shocks that are used to create them. The PBR Simplified Methods research team defined the severity of a scenario as being measured by the

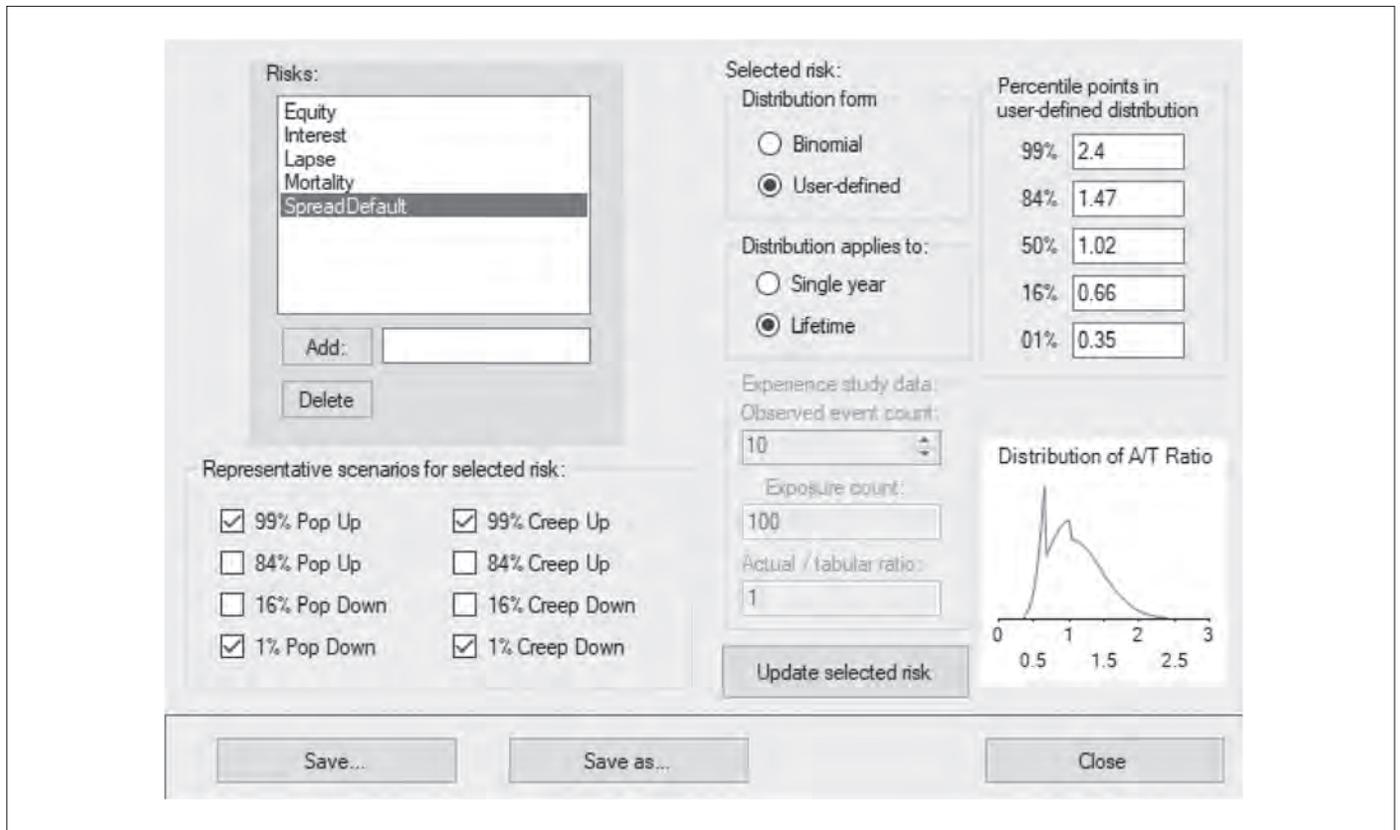
sum of the cumulative shocks. The pop and creep scenarios have the same sum of shocks over the first 20 years (240 months). In the pop scenarios, the shocks are higher initially and then grade off towards zero. In the creep scenarios, the shocks are the same in every month.

The user has the option to select the binomial distribution or to create a user-defined function. In the development of the generator, Brian Hartman developed an approach that permits the use of the binomial distribution for any material risk with a range from zero to one, such as lapse and mortality. The resulting distribution covers both estimation error and adverse deviation, as the valuation manual requires.

A user-defined function could be created when no relevant company or industry experience study is available, but the user has access to other information, such as credit spreads and default rates.

The choice of single-year versus lifetime scenarios impacts the frequency of change of the A/E factors for the specified risk.

Figure 2
Spread Net of Default Risk





In Figure 2 (pg. 26), note that the spread net of default risk employs a user-defined function that provides a single value for the first 20 projection years rather than varying year by year. After 20 years, the value reverts to the 50th percentile value of 1.02. For this situation, pop and creep scenarios do not apply. The percentile points shown in Figure 2 for the user-defined function were based on an American Academy of Actuaries presentation to the NAIC. Note the graph of this distribution is shown in the lower right-hand corner of Figure 2. The distribution of A/E ratios is skewed to the right, as one may expect.

OBJECTIVITY OF ASSUMPTIONS

Using the MRSG, the probability distributions of material assumptions are objectively defined for economic scenarios and for mortality and lapses based on company experience studies, relevant industry experience studies, and other relevant information sources.

In measuring assumption objectivity, the concept of central estimate assumptions is used. Central estimate assumptions refer to assumptions for the material risks to develop baseline assumptions for modeling those material risks in cash flow projection models. Where relevant company experience for a material risk is 100 percent credible, the relevant company experience for that material risk would be the central estimate assumption, including consideration of possible trends in the experience. When there is less than 100 percent credibility, the relevant company

experience could be credibility blended with relevant industry experience to establish the central estimate assumptions for a material risk, including consideration of possible trends in both relevant company and relevant industry experience. The central estimate assumptions should be updated regularly to not miss trends and provide a standard of comparison for the actual base assumptions used in the cash flow projection model. Four assumption objectivity measures are defined here.

Measure 1: Actual to Expected Ratios for the Material Assumptions

The central estimate assumptions provide the denominators for A/E ratios for the material assumptions for ULSG. The actual modeling assumptions (without margins) used as the basis for the cash flow projections provide the numerators in the A/E calculations. If the anticipated experience assumptions are set equal to the central estimate assumptions, the A/E ratios for all the material risks equal one. The A/E ratio provides a measure of the deviation of modeling assumptions to the central estimate assumptions for each material risk.

Measures 2, 3: Margin Impact, Percent Statutory Margin Impact

An anticipated experience reserve is defined as a deterministic reserve from the cash flow projection model using the anticipated experience assumptions. Similarly, a central estimate assumption reserve is defined for this demonstration as a deterministic reserve using the central estimate assumptions.

The anticipated experience reserve minus the central estimate assumption reserve for a block of business equals the margin impact. For this purpose, the statutory margin equals the reported statutory reserve for a block of business minus the anticipated experience reserve. The percent statutory margin impact equals the margin impact divided by the statutory margin.

If the anticipated experience assumptions equal the central estimate assumptions, the margin impact equals \$0 and the percent statutory margin impact equals 0 percent. Otherwise, these measures provide the combined impact of using modeling assumptions different than the central estimate assumptions. In a sense, these measures can be considered as measuring the degree to which the margin has been reduced to cover the use of other modeling assumptions.

Measure 4: Percent Aggregate Reserve Margin Impact

Using the MRSG to produce deterministic scenarios for each material risk at the 84th percentile of the distribution for that risk, an aggregate reserve margin is calculated, including a covariance adjustment, using either a square root formula

(like the statutory life risk-based capital formula) or a covariance matrix. The percent aggregate margin impact equals the margin impact divided by the aggregate reserve margin. If the anticipated experience assumptions equal the central estimate assumptions, the percent aggregate reserve margin impact equals 0 percent. Otherwise, this measure provides the combined impact of using modeling assumptions different than the central estimate assumptions. As above, this measure quantifies the reduction in margin due to using other modeling assumptions for one or more material risks.

APPROXIMATION METHODS FOR THE VM-20 STOCHASTIC RESERVE

Four products were tested for this project: level term, ULSG, accumulation UL, and par whole life. Using the MRSNG, the research team developed what we called “fully stochastic scenarios,” with all material risks varying according to the distributions defined in the risk definition file. The regulatory guardrail against mortality improvement was observed. The conditional tail expectation (CTE) 70 reserve based on 1,000 fully stochastic scenarios was the standard of comparison for the approximation methods. Two methods of approximating the PBR stochastic reserve for these products provided useful estimates that remained stable over three successive valuation years.

Method 1: Limited Number of Fully Stochastic Reserves plus CTE 70 Standard Deviation

The CTE 70 standard deviation is based on a 2005 article by John Manistre and Geoffrey Hancock in the North American Actuarial Journal titled “Variance of the CTE Estimator.” We refer to the sum of the CTE 70 stochastic reserve and the CTE error adjustment (i.e., standard deviation) as the “adjusted stochastic reserve.” For all four products, the adjusted stochastic reserve was greater than the CTE 70 stochastic reserve based on 1,000 fully stochastic scenarios for each of the numbers of scenarios run (30, 50, 100 and 200) and for each of the three successive valuation dates tested. The degree of conservatism in the adjusted stochastic reserve over the stochastic reserve based on 1,000 scenarios varied based on the number of scenarios.

Method 2: ULSG Central Estimate Reserve Plus Aggregate Margin at the 88th Percentile (Enhanced RSM)

The enhanced representative scenarios method (RSM) is a method to approximate the PBR stochastic reserve by projecting cash flows using separate deterministic scenarios for each material risk at a selected probability level (e.g., 88th percentile) to calculate an aggregate margin, which is then added to the central estimate reserve. For ULSG at December 2016, the aggregate margin was about 157.8 percent of the central estimate reserve. This result reflects the number of material risks associated with ULSG, as well as the degree of variability in those risks.

Sensitivity testing at the 88th percentile and the 12th percentile of the economic scenarios demonstrated that enhanced RSM continued to work well as an approximation method as economic conditions change.

REGULATORY DEMONSTRATION

When available, see the project report on the SOA website for a sample regulatory demonstration for ULSG. The regulatory demonstration for level term would contain similar elements.

In the testing for this project, the prevailing CRVM reserves for par whole life and accumulation UL were much higher than any of the modeled reserves calculated. It should be noted that modeled reserves reflect the level of expected profitability of the respective products; the higher the expected profitability of a product, the lower the modeled reserves. The regulatory demonstrations for these products simply need to provide evidence that the modeled reserves are less than the CRVM reserve. The goal is to minimize the extra work of PBR while still providing useful information for a company’s risk analysis.

OTHER USES

The PBR Simplified Methods Project has resulted in the development of new tools that can be used not only for approximation methods for the VM-20 stochastic reserves but also for other purposes.

VM-20 requires the development of margins for all material assumptions in both the deterministic and stochastic reserve calculations. The MRSNG could be a useful tool for the objective development of individual margins that reflect the amount of relevant experience underlying the specific material assumptions. The process of calculating an aggregate margin reflecting the covariance of the material risks can be used to calibrate the individual margins to avoid the stacking problem of just adding up individual margins.

Migrating asset adequacy analysis into a similar multi-risk modeling structure using the MRSNG and assumption objectivity measures would improve the analysis of company risk and the consistency of reserve measures among blocks of business. Since the material risks in the MRSNG are user-defined (except for economic scenarios), the generator could be used for the asset adequacy analysis of all long-tailed lines of business. Ranking of insurance risks could then be accomplished on a legal entity basis.

Many smaller companies use a percentage of RBC as a proxy for target surplus that is needed for pricing and capital allocation purposes. There is no theoretical meaning to a multiple of RBC but may simply represent a rule of thumb with respect to rating agency requirements to achieve certain ratings. With the

MRSRG, extremely adverse scenarios for each material risk can be selected and the results combined to produce a target surplus level that reflects the company's specific risks rather than an industry-wide average. Free surplus can also be computed consistently, and due to the excessive levels of statutory reserves for some products, the value of free surplus may be larger than previously thought.

GAAP reserve requirements currently require the addition of provisions for adverse deviations. The MRSRG could be used to produce those margins on an objective basis at a probability level consistent with GAAP.

The VM-20 stochastic exclusion test (SET) is focused on economic scenarios for interest rate and equity risk. The SET with a threshold of 6 percent may not differentiate well between products with different risk profiles. It may be that the MRSRG could be used to refine the SET as part of the NAIC's feedback loop. Regardless, a company could run tests using the MRSRG to determine whether stochastic reserves should be calculated, either as part of the PBR reserves or as a part of asset adequacy analysis.

The company's use of the assumption objectivity measures is entirely voluntary. In situations where reviewers (such as independent auditors, regulators or other interested third parties) may need assurance that assumptions used are appropriately set, the voluntary submission of assumption objectivity measures could help minimize time-consuming communications and increase trust for both current and future projects. Rate increase filings for long-term care and state examinations of PBR are two areas that could benefit from using this approach.

CONCLUSION

For level term and ULSG, VM-20 defines an NPR that is generally lower than the prior CRVM reserve for those products. For both products, reduced numbers of fully stochastic scenarios produced a CTE 70 reserve that, when augmented by the standard deviation of the CTE estimator, produced a good approximation of the CTE 70 reserve based on 1,000 fully stochastic scenarios. In addition, the enhanced RSM at the 88th percentile produced good approximations for the CTE 70 reserve based on 1,000 scenarios.

For the par whole life and accumulation UL products, the current definition of CRVM serves as the NPR. This reserve level does not reflect company experience and, for the product designs tested and the assumptions used in the cash flow projections, far exceeds the level of statutory conservatism targeted by the NAIC's Life Actuarial Task Force. For this situation, the incremental work to calculate the modeled reserves for PBR may not be useful. However, using the tools developed in this research project, enhanced work may be accomplished in asset adequacy analysis that could set the stage for future PBR developments, such as revised NPR calculations for these two product types. As noted, less-profitable products would produce modeled reserves that could be higher than the NPR (or CRVM) floor. ■



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Volatility from FASB Changes to Traditional Liabilities (Part 1)

By Leonard Reback

Under current US GAAP, as promulgated by FAS 60 and by FAS 97 for limited payment contracts, reserves for traditional nonparticipating contracts use locked-in cash flow assumptions and discount rates, as long as no premium deficiency emerges. Under targeted improvements, as promulgated recently by ASU 2018-12 and which will generally become effective in 2021, reserves for these contracts will use unlocked assumptions and discount rates. The impact of unlocking the discount rate will be reported in other comprehensive income (OCI). The impact of unlocking cash flow assumptions will result in retrospectively updating the net premium ratio (or net to gross ratio), with the net impact to the reserve reported in net income. The net premium ratio (NPR) will be capped at 100 percent and the reserve floored at zero by cohort. In addition, for limited payment products, the deferred profit liability will also be retrospectively updated. The unlocking of assumptions will generate more volatility in the reserves than occurs under current US GAAP.

INTRODUCTION

We can gain some insight into the volatility of reserves by examining the reserve formula under targeted improvements. In the absence of a change in discount rate, the results will be similar to the impact of DAC unlocking for FAS 97 UL-type contracts under current US GAAP or of unlocking SOP 03-1 reserve assumptions.

In this series, I demonstrate the impacts to reserves of updating projected future cash flows or truing up assumptions to reflect actual experience. Further, I demonstrate the reserve impacts under the condition that the discount rate has not changed since the contracts were issued. Even if discount rates have changed, these will be the reserve impacts that affect net income. In a future article, I will discuss the reserve impacts under the condition that discount rates have changed since the contracts were issued.

In all cases, I will assume that the NPR is not currently capped at 100 percent (i.e., the present value of gross premiums in the contract exceeds the present value of benefits) and that the reserve is not currently floored at zero. Also, for contracts that apply modified retrospective transition, the transition date would replace the contract inception date.

UPDATING CASH FLOW ASSUMPTIONS FOR PERIODIC PREMIUM PRODUCTS (NO CHANGE IN DISCOUNT RATE)

Assuming that the discount rate has not changed since inception and that historical cash flows have been trued up to reflect actual experience, the reserve at time t can be written as:

$$V_t = PVFB_t - PVFP_t \times NPR_t$$

Where:

| | |
|------------|--|
| $V_t =$ | Reserve at time t |
| $PVFB_t =$ | Present value of future benefits (plus any expenses included in the reserve) at time t |
| $PVFP_t =$ | Present value of future gross premiums at time t |
| $NPR_t =$ | Net premium ratio as measured at time t |

Retrospectively updating the NPR means that the ratio will reflect all actual cash flows from inception through the valuation date and all updated projected cash flows subsequent to the valuation date. So, the NPR can be written as:

$$NPR_t = PVFB_{0,t} / PVFP_{0,t}$$

Where:

| | |
|----------------|--|
| $PVFB_{0,t} =$ | Present value of all benefits from inception through the end of the contract, as measured at time t at the original contract discount rate |
| $PVFP_{0,t} =$ | Present value of all gross premiums from inception through the end of the contract, as measured at time t at the original contract discount rate |

For convenience, I will drop the t subscript from the $(0,t)$ and just use $PVFB_0$ and $PVFP_0$. Also for convenience, I will introduce two additional terms:

| | |
|------------------------------|---|
| $PVFB_s = PVFB_0 - PVFB_t =$ | Present value of all benefits incurred through the valuation date, as measured at time t at the original contract discount rate |
|------------------------------|---|

$PVFP_s = PVFP_0 - PVFP_t =$ Present value of all gross premiums incurred through the valuation date, as measured at time t at the original contract discount rate

$$\frac{dV_t}{dPVFB_s} = 0 - PVFP_t / (PVFP_s + PVFP_t) = -PVFP_t / PVFP_0$$

So, $PVFB_t$ includes all future benefits; $PVFB_s$ includes past benefits; and $PVFB_0$ includes all benefits. Now the reserve is written as:

$$V_t = PVFB_t - PVFP_t \times PVFB_0 / PVFP_0 = PVFB_t - PVFP_t \times (PVFB_s + PVFB_t) / (PVFP_s + PVFP_t)$$

To see what happens if I change an assumption that impacts future benefits or if a true-up in the amount of inforce impacts future benefits, I can take the derivative of V_t with respect to $PVFB_t$. This results in:

$$\begin{aligned} \frac{dV_t}{dPVFB_t} &= 1 - PVFP_t / (PVFP_s + PVFP_t) \\ &= 1 - PVFP_t / PVFP_0 = PVFP_s / PVFP_0 \end{aligned}$$

This derivative, and those that follow, assumes that the change in future benefits ($PVFB_t$) is independent of any change in future premiums ($PVFP_t$) or benefits and premiums already incurred ($PVFB_s$ and $PVFP_s$).

The reserve impact of a change in present value of future benefits will be the change in present value of future benefits, multiplied by the ratio of the present value of all historic gross premiums collected through the valuation date to the present value of all gross premiums expected to be collected over the life of the contract.

This is not surprising given the rationale for retrospective unlocking of the NPR. The change in present value of future benefits is spread over the life of the contract. To the extent that part of the life (as measured in premiums) has elapsed, that portion of the cash flow change gets reported through the reserve immediately. The remaining portion of the change is spread over the remaining life of the contract. This relationship becomes more complex if the discount rate has changed since contract inception, as I will discuss below.

In order to see how the reserve reacts to trueing up actual benefit incurred, take the derivative of V_t with respect to $PVFB_s$. That is because the experience true-up represents a change to current period benefits, which are part of the historical cash flows as of the valuation date. This results in:

When incurred benefits experience is trueed up, the reserve will decrease if the true-up generated current period benefits that were greater than those previously projected. The reserve will increase if the true-up caused a reduction to the previously projected benefits. The change to the reserve will be the ratio of the present value of all future gross premiums expected to be collected as of the valuation date to the present value of all gross premiums expected to be collected over the life of the contract. Again, this relationship becomes more complex if interest rates have changed since contract inception.

See how the reserve reacts if I change the assumption of future gross premiums by taking the derivative of V_t with respect to $PVFP_t$. Applying the quotient rule and some algebra, the result is:

$$\begin{aligned} \frac{dV_t}{dPVFP_t} &= 0 - [(1) \times PVFB_0 / PVFP_0 + PVFP_t \times (0 - (1) \\ &\quad \times PVFB_0 / PVFP_0^2)] = -PVFB_0 / PVFP_0 \\ &\quad + (PVFP_t \times PVFB_0 / PVFP_0^2) \end{aligned}$$

Since $PVFB_0 / PVFP_0 = NPR_t$, this reduces to:

$$\begin{aligned} \frac{dV_t}{dPVFP_t} &= -NPR_t + NPR_t \times PVFP_t / PVFP_0 \\ &= NPR_t \times (PVFP_t / PVFP_0 - 1) \\ &= NPR_t \times (-PVFP_s / PVFP_0) \\ &= -NPR_t \times (PVFP_s / PVFP_0) \end{aligned}$$

The impact to the reserve of a change in present value of future premiums is similar to the impact of a change in present value of future benefits, with two key differences. One is the sign. When the future premiums increase, the reserve goes down, rather than up as when future benefits increase. This is as expected. The other difference is the presence of the NPR in the impact.

If the NPR is close to zero, changing the future premiums will have very little impact on the reserve. If the NPR is close to 100 percent, the impact of a change in future gross premiums will be very similar (except for the sign) to that of a change in future benefits.

See, too, how the reserve reacts if I true up actual gross premiums incurred by taking the derivative of V_t with respect to $PVFP_s$. Again, applying the quotient rule and some algebra, the result is:

$$\begin{aligned} \frac{dV_t}{dPVFP_s} &= 0 - PVFP_t \times [0 - (1 \times PVFB_0)/PVFP_0^2] \\ &= (-PVFP_t \times -PVFB_0)/PVFP_0^2 \\ &= (PVFB_0/PVFP_0) \times (PVFP_t/PVFP_0) \\ &= NPR_t \times (PVFP_t/PVFP_0) \end{aligned}$$

As in the situation of changing a premium assumption, when truing up actual historical experience of premiums incurred, the reserve impact is similar to the impact of truing up benefit experience but with the opposite sign and with an impact from the NPR.

Although all the calculations above assume an NPR below 100 percent, it can be easily demonstrated that as long as the NPR is capped at 100 percent:

- Changes in the present value of future benefits or gross premiums would directly impact the reserve; and
- truing up actual cash flows would not impact the reserve.

This is because if the NPR is 100 percent, the reserve reduces to:

$$V_t = PVFB_t - PVFP_t$$

The reserve is simply a function of future cash flows, and historic cash flows have no impact. Thus, if the NPR is 100 percent:

$$\frac{dV_t}{dPVFB_s} = \frac{dV_t}{dPVFP_s} = 0$$

UPDATING CASH FLOW ASSUMPTIONS FOR SINGLE PREMIUM CONTRACTS

The impacts for limited payment contracts are similar to those for contracts with premiums throughout the life of the contract. For simplicity, let's look at a single premium contract. A limited payment contract such as a single premium contract would defer the premium loadings as a deferred profit liability (DPL) and amortize the DPL over an appropriate base, such as insurance inforce for a life insurance contract. I will assume here that inforce is the DPL amortization basis, although a different base can be used with no loss of generality.

If there have been no discount rate changes since contract inception, since there is only a single premium at inception the reserve at time t , V_t can be written as:

$$V_t = PVFB_t$$

The DPL at time t can be written as:

$$DPL_t = (P - PVFB_t) \times (PVFI_t/PVFI_0)$$

Where:

- P = the single premium at contract inception
- $PVFI_t$ = the present value of future in force amounts at the locked-in discount rate at time t
- $PVFI_0$ = the present value of future in force amounts at the locked-in discount rate as of contract inception

For convenience, I will also define $PVFI_s$ as the difference between $PVFI_0 - PVFI_t$, i.e., the present value of the inforce amounts that have already been reflected in DPL amortization through the valuation date.

Thus, the DPL at time t can also be written as:

$$DPL_t = (P - PVFB_s - PVFB_t) \times (PVFI_t/PVFI_0)$$

The total liability at time t , L_t , can thus be written as the sum of the reserve plus the DPL, or:

$$L_t = V_t + DPL_t = PVFB_t + (P - PVFB_s - PVFB_t) \times (PVFI_t/PVFI_0)$$

To see the impact of the liability for a change in assumption causing the present value of future benefits to change, take the following:

$$\frac{dL_t}{dPVFB_t} = 1 - PVFI_t/PVFI_0 = PVFI_s/PVFI_0$$

For the impact of truing up actual benefits, take the following:

$$\frac{dL_t}{dPVFB_s} = -PVFI_t/PVFI_0$$

CONCLUSION

Under targeted improvements, the liability for traditional non-participating contracts will become more volatile. This volatility will be a challenge to understand and explain. Even if the effect of a single change is understood, when multiple effects occur at the same time, the explanations will be more complex. For example, even if the current period reserve impact of higher-than-expected death benefits is understood, the increased mortality may have additional knock-on effects, such as a current experience deviation in premiums collected and lower in force than expected, impacting projected future benefits and premiums. ■



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Financial Reporting Research Update

By David Armstrong and Ronora Stryker

Research is a primary mission of the Financial Reporting Section and a significant use of our section dues revenue. Here is an update, as of December 2018, on projects in process and those recently completed.

CURRENTLY IN PROCESS ...

“Simplified Methods for Principle-based Reserve Calculations”—this project is in the late stages, and the project is being prepared for publication.

“The Application of Credibility Theory in the Canadian Life Insurance Industry”—this survey of credibility practices of Canadian life insurers will compare and contrast credibility methods used by the companies. The Financial Reporting Section contributed to the funding for this project. Work is in the late project stage.

“The Use of Predictive Analytics in the Canadian Life Insurance Industry”—this project will survey Canadian life insurers on the use of predictive analytics in practice. The Financial Reporting Section contributed to the funding for this project. Work is in the late project stage.

“Delphi Study of Economic Variables”—this study uses a Delphi Study framework to gather insights on the thought processes experts employ to estimate future values of economic variables. Work is in the early project stage.

“Macroeconomics Based Economic Scenario Generation”—this project intends to find a practical way to improve economic scenario generators by studying the causes of economic development, economic volatility and capital market volatility. Work is in the early project stage.

“Modeling and Forecasting Cause-of Death Mortality”—this study will develop mortality projection models and produce cause-of-death mortality forecasts. Work is in the early project stage.

“A Machine Learning Approach to Incorporating Industry Mortality Table Features in Mortality Analysis”—this research

applies a machine learning approach that would enable a practicing actuary to incorporate key industry mortality table features into insured mortality analysis. Work is in the early project stage.

COMPLETED IN 2018 ...

“Earnings Emergence Insurance Accounting Under Multiple Financial Reporting Bases”—this expands a 2015 research report on earnings emergence under multiple financial reporting bases. The original report looked at deferred annuities and term life insurance under US SAP, US GAAP, IFRS, CALM and market-consistent balance sheet approaches. This expanded report adds universal life and makes updates for principle-based U.S. statutory reserves, targeted changes to US GAAP, and the new IFRS for insurance products.

“Survey of Waiver of Premium/Monthly Deduction Rider Assumptions and Experience”—this report summarizes the practices and assumptions that different companies use for waiver of premium and waiver of monthly deduction benefits. Survey topics included mortality, valuation and pricing and may be valuable to companies as they prepare for a principle-based framework. The results were published in March. <https://www.soa.org/research-reports/2018/survey-waiver-premium-monthly-deduction-rider/>

COMPLETED IN 2017 ...

“PBA Change Attribution Analysis”—this project studied the drivers of change in principle-based reserves. An SOA webcast was also done at the time of publication, and the report was summarized in the December 2017 issue of this newsletter. <https://www.soa.org/research-reports/2017/2017-understand-vm-20-results/>

“Modern Deterministic Scenarios”—this was a review of possible deterministic scenario sets that could be useful to company management, regulators and rating agencies under PBA. The report was summarized in the December 2017 issue of this newsletter. <https://www.soa.org/research-reports/2017/2017-modern-deterministic-scenarios/>

“Actuarial Model Governance: A Survey of Actuarial Modeling Governance and the Industry Evolution Report”—this was an update to the original 2012 report co-sponsored by the Financial Reporting and Modeling Sections. <https://www.soa.org/Research-Reports/2017/2017-01-actuarial-model-governance/>



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REQUEST FOR RESEARCH PROPOSALS

Do you have an idea for a research topic you would like to see the Financial Reporting Section consider for funding? If so, we want to hear from you! For more information, please contact Dave Armstrong or Ronora Stryker. ■



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