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Implications of Actuarial Guideline 43 for Variable Annuity Product Design and Risk Management

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EXECUTIVE SUMMARY

Actuarial Guideline XLIII (AG 43, or the Guideline), the current U.S. statutory reporting requirement for variable annuities (VA), became effective as of December 31, 2009, replacing the formulaic and rules-based Actuarial Guidelines XXXIV and XXXIX. Despite companies preparing reasonably well for the transition to AG 43, the implementation process took many months with significant resources spent on analyzing and interpreting the inherently ambiguous areas in the methodology, where practice can, and most often does, vary from company to company.

As companies have now had a number of actual financial reporting cycles under AG 43, we feel that it is an appropriate time to comment on some aspects of the calculation that are being observed in practice, as well as to reflect on the implications of the Guideline on variable annuity product design and risk management going forward.

In this paper we will briefly discuss some observations that we have discovered as a result of a survey of the AG 43 implementation process for a number of U.S. variable annuity companies (including 10 companies ranked in the top 20 variable annuity writers, by 2Q 2010 sales). These observations illustrate the range of practice that exists in implementing the methodology.

However, the bulk of our discussion involves focusing on product design and risk management in light of the new statutory reserving paradigm. Our conclusions in this regard are as follows:

- The new statutory reserve paradigm will likely help sustain the recent movement to de-risk variable annuities. Changing product design is arguably the most effective risk mitigation strategy, and offers the most opportunity for innovation.

- For existing business, *de-risking* may not be practical, and so companies should understand how reserves change under various economic conditions and be prepared to anticipate and mitigate the impact to surplus and earnings.

- Not all variable annuity product designs are created equal under AG 43. Companies need to carefully consider what features to include in future product design. The design step should also involve projecting reserves and capital on a nested stochastic basis (or similar).

- Companies often have a range of metrics to meet, including those relating to GAAP, economic, statutory and rating targets. The design of hedging programs has to strike a balance among these needs, which may conflict at times. Most current hedging programs seek to protect the economic value of insurance companies. Although a book of business with well protected economic value will ultimately result in lower statutory reserves, the specific provisions of AG 43 could lead to short term reserve volatilities.

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INTRODUCTION

In April 2009, Milliman published the research report *A Discussion of Actuarial Guideline 43 for Variable Annuities*, which summarized the main provisions of AG 43, key drivers of the calculation, and a number of case studies illustrating the effect of the Guideline on typical VA product designs.

We are already almost a year into reporting under the Guideline. However, it is important to note that an in-depth understanding of how the new statutory reserving paradigm fits into the overall product design and risk management functions is still emerging.

This paper is intended as a follow-up to the earlier report. There are two sections to this paper. In this first section, we will discuss some insights that we have discovered as a result of a survey of 17 U.S. variable annuity companies. The participating companies run the full spectrum of product design types, range from small to large books of business, and also include companies with and without dynamic hedge programs and reinsurance treaties that support their portfolios. In the second section, we will focus on the prospective implications of the AG 43 reserving standard on variable annuity product design, risk management, and business strategy.

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DISCUSSION OF SURVEY RESULTS

For the most part, the questions in our survey related to the implementation of AG 43. Emphasis was placed on summarizing how companies have handled interpreting any particularly ambiguous parts of the Guideline. We have not included a full summary of all questions and responses included in the survey in this paper. Rather, we concentrate on briefly outlining what we feel are the most interesting discussion points.

CTE Amount vs. Standard Scenario Amount (SSA)

As of a June 30, 2010, valuation date, nine companies participating in the survey have AG 43 Aggregate Reserves (on a net basis) determined by the Standard Scenario Amount calculation. Of the remaining eight companies that are dominated by the CTE Amount, two have experienced at least one "flip" in the quarterly reserve calculation method since December 31, 2009 (at which time the reserve was determined by the SSA).

The dominance of the SSA on the AG 43 result is likely to be fairly representative of most variable annuity companies in the industry, although with the substantial decline in both interest rates and swap rates from 1Q to 2Q in 2010, the difference between the SSA and the CTE Amount values has narrowed for a number of companies.

Corporate Spreads

One interesting observation from the survey was the inclusion (or lack thereof) of corporate spreads in interest rates used for reinvestment assets and the discounting of accumulated deficiencies. Some actuaries believe that the use of such corporate spreads (net of default assumptions) is implicit in the phrase from the Guideline in Section A1.2) B) that states that "accumulated deficiencies shall be discounted using the same interest rates at which positive cash flows are invested, as determined in Section A1.4) D)," while some actuaries believe that the interest rates discussed in Section A1.4) D) are to be used without spreads because this section in the Guideline does not explicitly mention their use. From work that we have been involved in with companies in the industry, the perceived ambiguity in the wording has resulted in varying industry practice, with some companies including spreads and some companies choosing not to do so. This range in practice is exemplified in the survey, with 12 companies including spreads and five choosing not to.

Discounting Methodology

The survey also revealed the range of practice regarding the chosen discounting methodology used in the CTE Amount calculation. As outlined in the Guideline, there are three approaches to this, which we describe briefly here:

- **Option 1** requires the use of implied forward rates from the underlying swap curve on the valuation date. The swap rates are adjusted using a rolling risk premium structure.

- **Option 2** uses the 200 interest rate scenarios as prescribed by the American Academy of Actuaries C-3 Phase I scenario generator, calibrated to the yield curve as of the current valuation date.

- **Option 3** uses an integrated model of equity returns and interest rate scenarios.

Interestingly, a majority of companies seem to be using Option 2 (10 companies), with a smaller number of companies choosing either Option 1 (three companies) or Option 3 (four companies). That this is the case is likely a safe harbor carry-forward from how companies have implemented the C-3 Phase II methodology, which states that although an integrated set of scenarios is the most desirable option, using the approach outlined in Option 2 above is acceptable.

One item to note is that the mean reversion assumption that is implicit in the scenario generator specified in Option 2 is quite high (6.55% for the 10-year Treasury), resulting in projected interest rates that tend to grade up over time. The level and slope of these interest rates may have an impact on results – rates that grade up over time can lower requirements. It is our understanding that a new scenario generator is

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being produced that will have the ability to set the mean reversion assumption as a user-defined input. However, it is not clear at the moment whether this new generator will take the place of the existing generator in the Guideline. In any case, it is important that companies be aware of the mean reversion assumption and its associated impact.

The movements in interest rates from one valuation date to the next will impact the CTE Amount and SSA in different ways.

- Under the CTE Amount calculation, movements in interest rates will impact the accumulation and discounting of deficiencies, although the impact may depend on the choice of interest rate option that is used. For example, all else being equal, one might expect that under "Option 2" a movement in interest rates from one valuation date to the next will, while generating a different set of projected interest rates based on the updated starting yield curve, also tend to be "anchored" to some degree to the embedded mean reversion assumption. This in turn would tend to suggest that reserves would be less sensitive to interest rate movements under this option. Note also that movements in interest rates will also impact the value of the starting assets used in the CTE Amount projection, thereby directly affecting the reserve calculation.

- The basic SSA calculation itself is not sensitive to interest rate movement, but if there are interest rate hedges in place as of the valuation date, the unwinding of these hedges will have an impact on the reserve.

Revenue Sharing

One aspect of the methodology that has probably resulted in the most debate is revenue sharing. Companies appear to be adopting a conservative approach with respect to the reflection of revenue sharing in their calculations – 10 of the companies surveyed assumed zero guaranteed revenue sharing. This is likely due to the unclear guidance in the instructions surrounding the definition of what it means to be guaranteed, as well as to the level of scrutiny placed on revenue sharing by auditors in their review processes. The new Addendum to the C-3 Phase II practice note, made available in July 2009, should help companies better identify whether or not their revenue sharing contracts could be considered guaranteed.

As a result of AG 43, we expect that companies will try to ensure that any new revenue sharing agreements that are entered into are structured so that they are more likely to be considered guaranteed, thus allowing for a greater proportion of net revenue sharing income to be included in the projection. We expect that companies will consider restructuring existing agreements as well.

Model Compression

As might be expected given the stochastic nature of the calculation, a number of the companies surveyed indicated frustration with CTE Amount model run-times. Liability compression was the most common form of approach taken to reduce model run-time (seven companies), with other companies either using liability, scenario, and/or asset compression jointly (four companies), or no compression at all (six companies). Despite this, for the baseline AG 43 run (inclusive of hedging), the range of model run-times for those companies surveyed still ranged from around five hours to upwards of five days. This strongly suggests that classical or traditional approaches to model run-time are not up to the task.

One approach that addresses this issue is the clustering modeling technique that has been developed by Milliman. This technique enables users to efficiently model millions of policies into a few thousand (or even fewer) liability model points, with an accurate reproduction of the results corresponding to the associated seriatim file across a range of scenarios. Moreover, this technique is easily adaptable to assets and scenarios as well. More information on the underlying theory (and some case studies illustrating the approach) can be found in the research report *Cluster Analysis: A Spatial Approach to Actuarial Modeling*, available on the Milliman website.

A number of companies that we have worked with have already implemented the clustering process for other purposes, such as market-consistent embedded value, economic capital, and pricing, with very favorable results both from an overall process perspective and from reviews carried out by external

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auditors. We also know of one top 20 variable annuity writer that is reporting AG 43 reserves and C-3 Phase II capital requirements based on the clustering approach along with a number of others that are using the approach for sensitivity work.

Dynamic Hedging

With equity market and interest rate declines, both the CTE Amount and SSA components of the AG 43 reserve tend to increase dramatically due to the higher liability exposure in these economic conditions. One might expect that dynamic hedging would mitigate this somewhat. However, for many companies with clearly defined hedging strategies (including seven out of the nine companies surveyed for this report who are in this category), incorporating dynamic hedging into their AG 43 calculations has resulted in an increase in the CTE Amount reserve. This potentially creates a disincentive to dynamically hedge economic risks based (solely) on statutory results.

The observation that an increase in the CTE Amount reserve could occur after reflection of dynamic hedging was anticipated in our earlier research paper published in 2009. In essence, it is a result of the fact that in a CTE 70 calculation, there are likely to be scenarios captured in the worst 30% of results where the cost of hedging exceeds the gain. This situation is less likely to occur in the CTE 90 calculation under the C-3 Phase II capital methodology.

Note also that only existing hedges are allowed to be included in the Standard Scenario calculation – no credit for dynamic hedging is considered.

Reinsurance

In the situation where companies have multiple aggregate reinsurance treaties, there are no specific instructions in the Guideline as to how the overall ceded AG 43 reserve should be allocated to each reinsurer. We observed a number of different approaches from companies participating in the survey, including a quota share approach, a ratio approach, and allocating using the present value of Standard Scenario accumulated net revenue.

Taking different approaches may result in (materially) different answers. Although simplicity in the method is clearly important, care should be taken to understand and to be able to justify the allocation approach adopted and to ensure that it does not unfairly overstate any one reinsurer's exposure. Complicating matters is the fact that a company with multiple treaties may have some treaties that correspond to aggregate reinsurance and others to individual reinsurance.

When considering aggregate reinsurance under the SSA calculation, the impact of the accumulative net revenue caps should be reflected in the allocation process. Based on our experience, this can have a material impact on the calculation of the reserve credit for each reinsurer.

Attribution Analysis

Somewhat surprisingly, only seven of the companies surveyed indicated that they perform attribution analysis to decompose the overall movement in AG 43 statutory reserves (from one reporting cycle to the next) into economic and non-economic components.

An attribution analysis might involve the following presentation:

- **Non-economic components**
  These would typically involve reflecting the contribution of time decay (or aging of the business), decrements, withdrawals, premium deposits on existing business, and assumption changes to the reserve calculation.

- **Economic components**
  These would typically involve market movement, transfers or allocation changes, hedge program impact, interest rate movements, and volatility movements.

Any new business added between cycles would also be included separately.

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Although it might be somewhat laborious to set up initially, this presentation is likely to be helpful to senior management when trying to understand the drivers of the AG 43 reserve movement over time. It would likely also be easier to set up for the Standard Scenario than for the CTE Amount calculation, because some of the more complicated components of the above would not be applicable.

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IMPLICATIONS OF AG 43

ON PRODUCT DESIGN AND RISK MANAGEMENT

In this section we take a step back from implementation issues and consider instead the implications of the new statutory reserving paradigm on variable annuity product design and risk management.

For companies writing variable annuity business (or indeed any type of insurance), the goal is usually not to eliminate the risk that is assumed, but rather to manage that risk effectively. With the embedded guarantees in variable annuities, companies are essentially selling long-dated put options on equity markets. The most common ways of managing the risks arising from these guarantees include *de-risking*, product design, hedging, and reinsurance.

Each of these approaches has its own advantages and disadvantages, and a robust company-wide risk management framework would do well to consider all these approaches in some degree.

However, few actuaries would argue against product design being the most cost-effective way to manage the risk – clearly the most optimal risk management strategy is one where undue risk is avoided to begin with, and so de-risking during the product lifetime becomes unnecessary. Proper product design on the front end means subsequent risk management is more effective and reduces the need to resort to de-risking during the product life cycle. In a very real sense, therefore, product design and risk management are really two sides of the same coin.

In this section we discuss the implications of the AG 43 statutory reserving requirement on each of the following risk management strategies:

- De-risking
- Product design
- Hedging
- Reinsurance

De-risking
The recent financial crisis has refocused attention on total statutory requirements, and the attending impact of AG 43 and C-3 Phase II. In response, many companies have chosen to de-risk their existing business. These de-risking strategies have usually involved some of the business decisions outlined below, all of which are clearly also applicable when initially designing a new product to bring to the market:

- **Focusing on simple products**
  The emphasis here is on simplifying products in order to promote transparency. The more bells and whistles that are embedded into product, the harder it is to manage the risks that develop during the product life cycle.

- **Scaling back benefits**
  Any decisions that reduce the richness of the underlying guarantees will result in commensurately lower reserves. For example, modifying the rollup or ratchet features that are commonly found in variable annuity guarantees in any of the following ways will incur less risk:

  — Reducing the period over which the rollup or ratchet is applicable

  — Placing a cap on the accumulation (rollup) or step-up (ratchet)

  — Using simple interest rather than compound interest when applying the rollup percentage

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— Linking the rollup percentage to Treasury rates rather than employing a static assumption (thus linking the guarantee to market conditions)

— Ratchet at less frequent intervals

For guaranteed minimum income benefit (GMIB) products, offering more conservative guaranteed annuity purchase rates would be one way to decrease the underlying risk – such purchase rates would tend to be based on lower interest rates and more conservative mortality tables. Most products also stipulate that GMIBs can only be elected on (or near) the policy anniversary, which minimizes the likelihood of policyholders exercising their embedded options in response to an extreme market movement.

For guaranteed minimum withdrawal benefit (GMWB) products, one very prevalent de-risking strategy has been to decrease the age-tiered guaranteed withdrawal rates that are used once the policyholder has elected to start taking withdrawals. This clearly reduces the level of claims the company can expect to pay in the future once the account value has been fully depleted.

- **Increasing rider fees**
  Increasing the fees directly allows for higher margins under the SSA and CTE Amount calculations, thereby reducing the reserve requirement. Fees should also be made a function of either the guarantee value, or even the higher of the guarantee value and the account value, to ensure that the fee income is not reduced in depressed equity markets.

  Some companies have instituted the contractual ability to increase fees over time, or to set fees based on underlying separate account investment options that are available to the policyholder. Those policyholders who choose to invest in more risky funds would be required to pay a higher rider fee.

  However, because fees are arguably the most visible aspect of the product, due consideration must be given to how raising fees would affect the competitiveness of the product.

  Note that it is possible, although unlikely, that in a real-world setting increasing fees would result in a drag to the account value growth that may actually increase reserves. This situation is more probable under a risk-neutral valuation.

- **Basis risk and volatility risk management**
  By carefully selecting the type and the number of investment options in which policyholders can place funds, or by simply requiring that the overall allocation be capped at a certain equity limit, companies can mitigate the volatility exposure in their business.

  Typically, the investment options would be restricted to those that are more hedge-friendly, and so any remaining basis risk is also (at least partially) managed. In some cases, investment options for certain products could be limited to only passive index funds in order to minimize basis risk.

  Companies can also engage in internal rebalancing, by using a customized algorithm to automatically rebalance the allocation in response to market conditions, which lowers the exposure to equities when realized volatility is high.

  By reserving the rights to either change investment options going forward, or change the rebalancing algorithm going forward, companies have greater flexibility to manage risk proactively in response to changing economic conditions.

In employing these strategies, companies reduce the risk in their products, thereby automatically reducing the notional exposure required for other risk management strategies, such as hedging. To the extent that this reduces the projected benefits under the tail scenarios, the reserve and capital requirements under AG 43 and C-3 Phase II respectively are lessened.

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It is important to note, however, that each of the above strategies will potentially differ in the degree to which they are effective. All else being equal, reducing the guaranteed withdrawal rates for example is likely to have a larger, more direct impact on the reserve calculation than the arguably indirect approach of limiting the investment options associated with the product. The important takeaway here is that it is critical to test the impact of these strategies, in isolation and in aggregate, in order to better understand the consequences of each potential de-risking decision.

Further, there are clearly a number of important practical items that need to be worked through when considering whether or not to de-risk. For example, there will inevitably be push-back from a company's marketing area, who will want to make sure that the range of product features and investment options available to the policyholder is as wide as possible, ensuring stronger product sales. There will also be the need to consider whether or not scaling back the benefits for an existing product would pass regulatory approval. The decision to implement de-risking strategies should also be made in the context of the risk appetite and capital position of the company as a whole.

Lastly, de-risking is only practical to the extent that contract language allows for such changes, usually upon reset or for new purchases of existing contracts. More often, companies may need to stop sales of current products and replace with new products because it may not be possible to significantly change the nature of the existing contracts.

Product Design

Under the AG 43 statutory reserving paradigm, not all guaranteed benefits are created equal. With the drive toward new innovative concepts to meet ever-changing consumer demands tempered by the need to reduce overall reserving and capital requirements, we anticipate that certain product designs that are more costly under the new paradigm will be less likely to make the cut going forward. This could mean that new products may limit these features to some degree.

Companies would also do well to pay close attention to those guaranteed benefit designs that seem to be expensive under either Standard Scenario or the CTE Amount calculation:

- **Rollup vs. ratchet designs**
  The basic rollup feature accumulates initial premiums (less any withdrawals) using an assumed rollup percentage rate. The basic ratchet is a maximum anniversary calculation that compares the current guarantee to the prevailing account value at an anniversary and resets the guarantee to the larger of the two values. Both these features, typically with subtle variations, are often sold in combination, with the policyholder entitled to a guaranteed value equal to the larger of the two.

  The rollup feature tends to be more expensive than the ratchet feature, because for rollups the guarantee is always increasing over time (absent partial withdrawals), whereas for ratchets the guarantee only steps up on a ratchet anniversary if the account value is higher than the ratchet amount. Under the SSA, for example, the projected equity returns less all applicable fees and charges that are used to grow the account value tend to be less than the rollup assumption that is used to increase the guarantee base, implying that the rollup will tend to dominate.

  As indicated earlier, the impact of ratchets can be lessened by decreasing the frequency with which they apply. In recent years it has not been unheard of for companies to have ratchets that operate on a monthly or daily basis. By employing ratchets with less frequent step-ups, risk is potentially mitigated.

- **Guaranteed living benefits**
  AG 43 tends to result in greater sensitivity to capital market conditions (equity and interest rate movements) than the old statutory paradigm, especially for guaranteed living benefits. It is our expectation that, generally speaking, GMIBs will tend to be more expensive than GMWBs under the AG 43 framework, especially where the SSA is concerned.

  Under the SSA, the GMIB election rate can be 25% for guarantees that are more than 20% in-the-money. This is likely to be higher than the dynamic election rates assumed in the CTE Amount

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calculation, which is based on company experience, suggesting that GMIB designs are likely to be more costly under the Standard Scenario than under the CTE Amount calculation.

GMWBs tend to be quite sensitive to policyholder behavior. Under the Standard Scenario, once the policyholder has started taking guaranteed withdrawals, less than full utilization of the maximum allowed withdrawal amount is possible (depending on attained age and how the withdrawals affect other guaranteed living benefits that might also exist).

The timing of when guaranteed withdrawals are assumed to start also plays an important role. One might expect that assuming earliest exercise is the most conservative, as opposed to assuming a varying mix of (future) deferral periods. However, in some product designs deferring exercise means that a bonus credit would become available at a later date, implying that deferral (and not earliest exercise) might be the path that is the more valuable to the policyholder.

Assuming rational behavior, the age of the policyholder will usually determine the course of action here; younger ages can defer their withdrawals and wait to get the bonus credit simply because they will have many future years over which to take withdrawals. However, for older ages it will likely be optimal to start taking withdrawals sooner rather than later, although the guaranteed withdrawal rate (typically tiered by attained age) will also be an important consideration.

The above discussion is clearly suggestive of complex path dependency. It is thus very important for companies to test how their products fare under these situations so that they can better understand how their reserve requirements under AG 43 will emerge.

- **Offsetting risk by selling products that naturally hedge each other**
  It may be possible to sell products that (at least to some extent) naturally hedge each other.

  An example of this would be offsetting part of the longevity risk in a GMWB product by also selling a product with a guaranteed minimum death benefit (GMDB) feature, which introduces some mortality exposure.

Lastly, in order to properly capture profitability one cannot ignore calculating AG 43 reserves and C-3 Phase II capital requirements during pricing. Projecting out these items is no simple exercise, because in order to do it properly it requires a nested stochastic projection. Consequently, run-time is certainly a concern, although using clustering would help in this regard. A more feasible solution might be a two-pass run where a prior projection calculates statutory reserve and capital factors that are then referenced in a subsequent pricing run.

Performing stress tests during pricing (equity shocks, interest rate shocks, varying policyholder behavior) is also desirable from a risk management perspective in order to understand how profitability is sensitive to stressing the AG 43 reserve and C-3 Phase II capital requirements.

Hedging

As mentioned earlier, for many companies incorporating dynamic hedging into their AG 43 calculations has resulted in an increase in their CTE Amount reserve. From a risk management perspective, this non-intuitive result can persuade companies to unnecessarily modify their dynamic hedge programs, not in response to any true change in the underlying economic risk of their business, but simply with the intent to mitigate increases in their statutory reserves. Dynamic hedging programs usually target GAAP or economic value exposure, and although the former is potentially based on book value (SOP 03-1 for GMDB or GMIB products), it may also be based on an economic-type liability (FAS 133 for guaranteed minimum accumulation benefit [GMAB] or GMWB products). In the recent economic environment, some variable annuity writers are also implementing hedging programs aimed at protecting statutory solvency, with the philosophy that they need to protect their solvency, but are willing to take capital market risks beyond that.

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Under the SSA calculation, existing hedges are reflected in the calculation and are fully liquidated by the end of the first projection year. Assuming existing equity hedges, the impact to the reserve is likely a credit that is due to the hedges paying off under the prescribed immediate drop scenario. However, importantly, no credit for dynamic hedging is allowed in the calculation and so therefore dynamic hedging cannot contribute to managing the movement in the SSA reserve. If the SSA dominates the reserve calculation, this creates a situation whereby the reserve movement is disconnected from the dynamic hedging program, but where conclusions about the efficacy of the dynamic hedging program may be drawn based on the volatility of statutory results.

When evaluating hedge instruments to be used for both the existing static hedges and for the dynamic hedging program, care should be taken to understand how each instrument behaves under each of the different paradigms.

Because hedging only addresses market risk and not policyholder behavior risk, the latter is also an important consideration when developing and maintaining a dynamic hedging program. Policyholder behavior assumptions with respect to full lapses, withdrawals, and guaranteed living benefit elections must be incorporated. To the extent that actual experience deviates from expected policyholder behavior assumptions, there will be corresponding gains and losses in the hedge program. Thus, having an effective monitoring process in place to update assumptions based on emerging experience is needed.

In the AG 43 calculation, actual policyholder behavior is reflected through the valuation date via changes in the in-force cohort, with expected policyholder behavior (based on company experience) modeled subsequently in the CTE Amount projection. However, the assumptions under the SSA are prescribed and therefore companies cannot reflect their expected policyholder behavior assumptions in this calculation.

Reinsurance

Reinsurance transfers the risk associated with either the guarantees or the total contract itself (base contract and guarantees). It usually has the benefit of transferring both capital market and actuarial risks, and is therefore more of a complete risk transfer than hedging, which only addresses capital market risk.

To the extent that hedging cannot completely address the volatility of statutory exposure under AG 43, reinsurance may be a good addition to a company's overall risk management strategy. However, because of the higher current market volatility since the financial crisis, our expectation is that it will be hard to find reinsurance solutions for variable annuity guarantees, both because such solutions will likely be expensive and because reinsurers have mostly exited the variable annuity marketplace.

For companies with already existing reinsurance solutions, the impact of the reinsurance may depend on whether the type of reinsurance in question is aggregate or individual. Under the SSA, for example, individual reinsurance is to be reflected directly in the contract-level Net Revenue calculation, whereas aggregate reinsurance (which usually has contract-stipulated aggregate limits in place) is projected in aggregate across all contracts and then the present value is captured and allocated back to each individual contract.

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CONCLUSIONS

The results of the survey we have conducted has corroborated our expectation that there is a wide range of practice that exists in implementing the methodology, especially with regard to ambiguous items, which include (but are certainly not limited to) the treatment of revenue sharing, corporate spreads, and reinsurance allocation.

Our expectation is that the AG 43 statutory reserving paradigm will help sustain the current movement to de-risk variable annuities. We also believe that if they have not already done so, companies will view product design as a key risk management strategy in controlling the volatility in statutory reserves, especially via building in sufficient flexibility up-front to manage risk. Proper product design should also involve nested stochastic projections of AG 43 reserves and C-3 Phase II capital requirements to understand its impact to profitability.

As we have discussed, not all variable annuity product designs are created equal under AG 43. Certain designs such as rollups and GMIB designs tend to be more expensive under the Guideline.

Moreover, although dynamic hedging is a perfectly sound risk management strategy to hedge the underlying economics, it does not provide any relief in the Standard Scenario Amount calculation and will also likely increase the CTE Amount reserve. With the Guideline as it currently stands, other strategies should be used to try to reduce unexpected movements in the statutory reserve.

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