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Report of the American Academy of Actuaries'
Annuity Reserves Work Group

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Life Actuarial Task Force

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Annuity Reserves Work Group

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Introduction

The Annuity Reserves Work Group (ARWG) provides professional assistance to the Life Actuarial Task Force (LATF) in the development of requirements for non-variable annuity Principle-Based Reserves (PBR). To that end, the ARWG has been working on the development of a possible definition of Deterministic Reserves for use in VM-22.

During this work, the ARWG became aware of CARVM reserve questions and apparent anomalies for fixed annuities (including equity indexed annuity products). Since the ARWG had assisted LATF in developing the 2009 modifications to Actuarial Guideline XXXIII (AG 33) that addressed benefits such as Guaranteed Lifetime Income Benefits (GLIBs) offered with fixed annuities, the ARWG realized that these questions and apparent anomalies included issues surrounding the application of AG 33 to GLIBs. This report provides LATF with background on these apparent problems (and others described below) and offers our assistance to analyze them further and possibly to provide solutions.

Survey

In an effort to gather more information about apparent CARVM reserve anomalies, the ARWG conducted an informal survey of actuaries who work in the non-variable annuity reserve arena. This survey

requested information on any type of unusual CARVM reserve results, whether high or low, and whether or not specifically related to GLIB benefits. To ensure the confidentiality of the information, the Society of Actuaries (SOA) volunteered to send out the survey, collect the results, and remove all identifying information from the responses prior to forwarding them to the ARWG.[1] Our understanding of the SOA effort is that it resulted in 330 emails sent to individual email addresses obtained from a combination of the following sources:

- Attendees of Session 51PD at the 2011 Valuation Actuary Symposium that provided an update on ARWG activities;
- Licensees of annuity valuation software provided to the SOA by Actuarial Resources Corporation, Milliman, and PolySystems; and
- Select insurance regulators (as identified by SOA member database information).

Survey Recipients and Respondents

There were multiple recipients of the emails at many companies so that the recipients represented fewer than 330 companies. One regulator and 10 companies and organizations responded to the survey. For the sake of brevity and in recognition of repetitive responses and issues already being addressed by LATF, the ARWG chose not to include each and every response with this report.[2]

Survey Responses

In summary, however, four main issues, including apparent CARVM reserve anomalies and questions, were identified by the respondents:

1. **GLIB Reserves.** This issue involves the development of reserves that were reported to be in excess of accumulation values at some age/sex combinations on products having certain types of GLIB benefits. This appears to be the result of the requirements under AG 33 to consider *all possible* Integrated Benefit Streams, regardless of the likelihood of their occurrence. This is exacerbated by the requirement of deeming that 100% of contract owners elect the option(s) that give rise to the greatest present value.

   While this is not a new interpretation of CARVM under AG 33, this could be the source of the GLIB Reserves issue, since one may characterize certain of the Integrated Benefit Streams required by AG 33 as implausible because of the apparently small likelihood of their occurrence.

   Upon further investigation of this issue, the ARWG was able to reproduce the level of CARVM reserves that was reported through the survey. With the expertise of ARWG members familiar with these products, the ARWG has developed a detailed Excel® workbook to calculate CARVM reserves on sample products containing GLIB benefits. This assists in the ARWG's understanding of the process resulting in apparently large reserves for these sample products.

   Details of this reserve issue can be found in the Appendix to this report.

   The ARWG believes the best method to address reserve issues such as this is the use of a principle-based approach, providing an exhaustive methodology for recognizing all benefit and contract owner dynamics of such products.

[1] The ARWG is indebted to Mike Boot of the Society of Actuaries for this effort.
[2] A copy of the responses, as submitted to the ARWG by the SOA, is available from the Chairperson of the ARWG.

However, as noted earlier, the ARWG has been developing a Deterministic Reserve (DR) to recommend to LATF for use in VM-22. The ARWG is currently looking at a potential DR that is based on AG 33 but with the introduction of restricted ranges of incidence rates, possibly including lapse rates for certain benefits, into the Integrated Benefit Streams. Thus, instead of having to consider all possible incidence rates from 0% to 100%, only incidence rates within a prescribed range would be required. Such an approach would be similar to the approach taken with the Standard Scenario in AG 43, that is, a DR that is based on an AG 33 framework incorporating lapse and utilization rates for benefits that would be specified in the requirements, such as GLIBs.

It may be possible to look at this DR approach as a potential answer to the GLIB reserve issue raised in the survey. That is, it may be possible to modify AG 33 to introduce prescribed ranges of incidence rates and/or lapse rates that would apply to GLIB benefits issued prior to the date VM-22 becomes effective.[3] Of course, the range of incidence rates under such a modification would likely need to be wider than the range that could be used in a DR under VM-22. This is because the DR would only be one component of the PBR under VM-22, as opposed to being the only reserve required to be calculated under a modified AG 33.

If LATF would like the ARWG to investigate the possibility of such a modification to AG 33, we would be happy to do so.

2. **"Out of Sync" Calendar Year Statutory Valuation Interest Rates.** A few survey responses stated that some of the calendar year statutory valuation interest rates are too high relative to net investment yields currently available. One respondent also indicated that calendar year statutory valuation interest rates do not recognize changes to investment yields caused by reinvestment many years after contract issue, thereby distorting the relationship between the company's net investment yields and the valuation interest rate. Given that these rates are specified by formula in the Standard Valuation Law (SVL), the problems identified in this item may be impractical to solve until the SVL is reopened for modification.

3. **CD Annuity Valuation / Change In Fund Valuation Interest Rates.** One of the respondents noted that virtually every aspect of a CD annuity is "renewed" once the initial interest guarantee and surrender charge period has expired. Further, the insurer must be prepared to pay out the full accumulation value without surrender charges in the "window" that exists upon resetting the interest guarantee and surrender charge period, so we conclude that virtually all funds are reinvested at yields then available.

   Thus, it would seem that valuation interest rates should also be refreshed as would be the situation for currently issued business.

   The survey respondent mentioned above was concerned that no refreshing of valuation interest rates is permitted. However, subsequent discussions within the ARWG revealed that the Change in Fund valuation method may already contemplate this treatment. For instance, *U.S. Tax Reserves for Life Insurers* states the following with respect to the method:

[3] Our understanding is that VM-22 will apply to business issued on and after the effective date of that section. Thus, for contracts issued prior to that date, AG 33 would continue to apply to the valuation.

> "When a new guaranteed interest rate and period is provided by the company on an existing contract, the company may update the calendar-year valuation rates, but this update is not required."[4]

Nonetheless, official clarification regarding refreshing valuation interest rates may be needed. In addition, a regulator responding to the survey highlighted the differences that can occur between curtate and continuous CARVM on these products. Clarification may also be needed regarding how surrender charges that are temporarily waived by insurers should be reflected in curtate or continuous CARVM reserves.

4. **Proper Valuation Interest Rates for Settlement Option Elections.** One respondent raised the question of whether, upon election of a settlement option, the valuation interest rate corresponding to the year of election or to the year of original contract issue should be used for subsequent valuation. In 1997, the CARVM Multiple Benefits Work Group of the Academy (which worked with the Life and Health Actuarial Task Force in the development of the modifications to the original AG 33) reported that "Actuarial Guideline IX-B allows valuation interest rates to be based on (1) when the original contract issued; or (2) when the consideration was received, or (3) when payments actually begin, but must apply such procedure elected in a consistent manner." Thus, it may be that this issue has actually already been resolved.

Additional Questions

In addition to these topics mentioned by respondents, members of the ARWG had previously identified three other areas of uncertainty in the application of CARVM and AG 33 to today's fixed annuity contracts.

1. **Proper Valuation Interest Rates for Contracts with Temporary Market Value Adjustments (MVAs).** Contracts having MVAs can qualify for Plan Type B rates. But what if the MVA is temporary? What if the MVA period does not coincide with a guarantee of interest higher than the minimum required? Does the valuation interest rate revert back to Plan Type C after the MVA period? During the MVA period, if a penalty-free partial withdrawal is not subject to the MVA, would Plan Type B or Plan Type C apply? Another issue might be the application of Plan Type B or C to a GLIB withdrawal that is exempted from the MVA.

2. **Integrated Benefit Streams on Contracts having Multiple Indexed Interest Crediting Options.** Some products that contain multiple accounts representing different crediting options for portions of the accumulation value offer contract owners the option of moving part of their accumulation value from one account to another – much like on variable annuities. The different accounts may present guarantees with slightly different value. Should this option be considered an Elective Benefit under AG 33?

3. **Contingent Surrender Charges.** Some plans offer waiver of surrender charges under circumstances that may be difficult to measure. For example, contracts issued to teachers under IRC §403(b) where the teacher is separated from service and/or otherwise qualifies for distribution without federal tax penalty. For that situation (or similarly tax-exempted cases), surrender charges may be waived. Should a utilization rate less than 100% for the waiver be allowed under AG 33?

[4] Robbins, E. L. and Bush, R. N. (2006). *U.S. Tax Reserves for Life Insurers*. Shaumburg: Society of Actuaries, p321.

Summary and Commentary

The ARWG believes that VM-22, when it is completed and becomes effective, can address all of these issues. We believe VM-22 will result in reserve requirements that adapt more readily to plausible product risks than the current formulaic approach does under AG 33.

However, we believe it may be possible to effect a modification to AG 33 to introduce prescribed, restricted ranges (i.e., less than 100%) of benefit election (incidence) ranges and possibly lapse rates for specific benefits, should LATF choose such a route. This could also serve as a bridge for the DR to be included in VM-22.

We believe the existing CARVM approach continues to work well as a "formula reserve" for the majority of products. Therefore, should LATF request the ARWG's assistance in modifying AG 33, we envision that any resulting proposal would retain other aspects of CARVM valuation intact for products and features outside the scope of the modification.

Finally, the ARWG wishes to point out that *all* of the issues identified in this document are best addressed by a principle-based approach to the valuation of non-variable annuities. This would allow appropriate recognition of all contingencies and risks within the contracts, including those enumerated here and those not yet envisioned. It would also allow insurance regulators to reduce the time they must spend creating "Band-Aid solutions" to one problem after another. In achieving that end, the ARWG restates its willingness to assist LATF in its efforts to move expeditiously toward such a valuation approach.

Appendix: GLIB Reserve Calculation Detail Provided by Survey Respondents

The typical GLIB benefit allows contract owners to elect, at almost any duration after issue, to receive a series of equal periodic withdrawals (GLIB withdrawals) which, if other contractual requirements are met, will continue for life.

The amount of the GLIB withdrawals is typically predicated on the greater of the contract's normal accumulation value or a "benefit base" accumulation,[5] the latter of which accumulates from issue, independently of the contract's accumulation value, at an attractive rate, frequently guaranteed for some duration. This "greater of" value is multiplied by an income factor that varies by attained age. GLIB withdrawals, subsequent to election and when taken, are assessed against the accumulation value and against the benefit base. "Excess" withdrawals from any remaining accumulation value are allowed and typically reduce or eliminate future GLIB withdrawals. The amount of the GLIB withdrawals is guaranteed to continue for life.

Typically, prior to election, the amount of the available GLIB withdrawals increases with advancing age of election, both because of the continued increase in the benefit base and the increase in the income factor.

- The anticipated increase in income may cause some contract owners to delay electing the withdrawal benefit.
- Some GLIB designs provide that the contract's death benefit is the greater of the remaining accumulation value or the benefit base, paid over four or five years without interest. Such a design may further induce some contract owners to delay starting the GLIB withdrawal stream.
- Still, one might reasonably expect that a sizeable percentage of contract owners would elect these withdrawals at usual retirement ages.
- Further, the absence of an additional death benefit feature might also provide a relative incentive for early election of the GLIB withdrawal stream.

Despite any incentives for starting the GLIB withdrawal stream "sooner rather than later," one of the AG 33 required Integrated Benefit Streams suggested in the survey assumes that, for a cohort of buyers at ages in the mid-50s:

(i) no contract owners elect to start the GLIB withdrawals until the age at which the greatest actuarial present value of withdrawals occurs, such as at age 74;

(ii) no contract owners fully surrender the contract, or elect any other Elective Benefits despite CARVM's projection of the accumulation value at guaranteed crediting rates significantly less than rates projected and guaranteed on the GLIB benefit base;

(iii) at the end of the guaranteed "rollup period" from issue, such as 10 years (prior to which an attractive and guaranteed rate of interest has been credited to the benefit base), contract owners elect to restart the rollup period and restart deduction of the GLIB benefit charges; and

(iv) all contract owners surviving to the age of greatest present value of withdrawals, such as age 74, then elect the GLIB benefit, with the beneficiaries of those who die after election further electing to receive any remaining value in the benefit base in a series of installments instead

[5] Different products use different terminology, of course, including "income calculation base," "benefit calculation base," and "income accumulation value." The term "benefit base" is meant to encompass all such terms within the understanding of the term.

of opting for an immediate death benefit equal to whatever amount may remain in the contract accumulation value.

There are apparently instances where a reserve at issue can be nearly 50% higher than the insurer-determined single premium, as is illustrated by the chart that follows, reproduced from one of the survey responses. We assume that, upon adoption of VM-22, non-variable annuity PBR would likely require the use of appropriate assumptions with margins for the election rates for GLIBs. Thus, current statutory reserves for these benefits may be significantly in excess of the reserves that would be established under a PBR framework on the assumption that benefit election incidence rates under PBR would be less than currently required to be considered under AG 33. The survey respondent apparently also calculated a reserve that incorporated incidence rates (i.e., the last column) in addition to the reserve currently required under AG 33 (the second to last column).

		Premium	**$100,000**				
		Cash Surrender Value at Issue	**$88,000**				
		Issue Age	**50**				
		Gender	**Male**				
					AG33 Reserve (Optimal Utilization)		**AG33 w/ Utilization**
Assumed Income Start Age	55	60	65	70	**74**	75	**66.2**
Assumed Years to Defer Income	5	10	15	20	**24**	25	**16.2**
PV of Death & Surrender Benefit	$77,431	$73,571	$57,700	$44,671	**$40,765**	$38,461	**$55,278**
PV of Guaranteed WD Benefit	$13,790	$31,367	$63,624	$86,094	**$107,681**	$109,015	**$64,853**
Total Reserve at Issue	$91,221	$104,938	$121,323	$130,765	**$148,446**	$147,477	**$120,131**