SOCIETY OF ACTUARIES Financial Reporting Section

The Financial Reporter

ISSUE 91 DECEMBER 2012

RESPECT

By Henry Siegel

Like many people, I've been working with the International Accounting Standards Board (IASB) for almost 10 years on its insurance contracts project and for the past several years with the Financial Accounting Standards Board (FASB) as well. In working with people on a project for that long, you learn a few things about them. If there's one thing I've learned about every board member and staff member that I've worked with it's that they are trying their best to devise the best standard they can. I'd also add that, without exception, the board members and staff are smart and hard-working. In many cases, very smart and very hard working!

So it upsets me when I hear a board member make comments that imply those of us in the industry are trying to get a standard which will allow us to manipulate our earnings or that our comments are not worth listening to. When I compare our experience with other industries, the number of accounting frauds in our industry I can remember are few and relatively long ago (e.g., Equity Funding). The companies I'm familiar with have a very serious attitude toward showing their earnings in a meaningful way. I remember clearly a situation where the chief financial officer (CFO) of our company, not an actuary, came to visit our chief actuary to ask if he could lower reserves on a block of pension contracts that had been set up based on an asset adequacy test in excess of statutory minimums. The conversation was short. "No," said the chief actuary. The CFO walked out, no further discussion. This was not the only time I've heard similar conversations.

I've even had them myself. I was asked once by a business unit CFO if he could raise an incurred but not reported (IBNR) reserve he had already journalized because he didn't need the earnings this year and wanted to release it the next year. Again, it was the same short conversation.

CONTINUED ON **PAGE 6**

Actuaries
Risk is Opportunity.®

The **Financial** Reporter
ISSUE 91 DECEMBER 2012

Published by the Financial Reporting Section Council of the Society of Actuaries

This newsletter is free to section members. Current issues are available on the SOA website (www.soa.org).To join the section, SOA members and non-members can locate a membership form on the Financial Reporting Section Web page at www.soa.org/fr.

CLARIFICATION OF THE SEPTEMBER 2012 *FINANCIAL REPORTER* ARTICLE TITLED,

"Statutory Reserving for Fixed Indexed Annuities with Guaranteed Lifetime Withdrawal Benefits"

By Kush Kotecha, Ben Yahr, and James Collingwood

We would like to offer the following clarifications to our article, "Statutory Reserving for Fixed Indexed Annuities with Guaranteed Lifetime Withdrawal Benefits," published in the September 2012 issue of the *The Financial Reporter*.

In our article we stated:

- "The American Academy of Actuaries (AAA) Annuity Reserves Working Group (ARWG) has taken up the issue from the industry's perspective …"

  We did not mean to imply that the AAA and any of their working groups act on behalf of the industry and/or are the voice of the industry. Rather, we desired to note that the ARWG brought this issue to the attention of the Life Actuarial Task Force (LATF) of the National Association of Insurance Commissioners based on observations of AAA membership. We want to clarify that the ARWG was representing the AAA and the actuarial profession only and not the industry.

- "… a reserve calculation tool was developed by the ARWG to illustrate the impact of allowing for utilization and lapses in determining the present value of benefits for the GLWB benefit under a modified AG33 approach."

  We would like to clarify that the main purpose of the tool developed by the ARWG was to demonstrate the calculation of statutory reserves under AG33 for fixed annuities with GLIBs and tabulate the level of reserves in relation to other measures. However, as an ancillary benefit, it optionally demonstrated the effect of including utilization and lapses in the calculation, which would provide insight into the GLIB calculation.

- "Noting that these products are similar to variable annuity products with guaranteed living benefits, the ARWG has also proposed using an AG43 approach to the Fixed Annuity Subgroup. …"

  We would like to clarify that the ARWG has not made this proposal nor have they taken a stance on whether any changes to current practices are advised. However, various individuals have made proposals similar to that described in the article to the Fixed Annuity Subgroup, but they have not been made or endorsed by the ARWG.

- Finally, "As a result, we expect to see companies with large blocks of this type of business explore the feasibility of obtaining a permitted practice from their state of domi-

cile to allow them to use a modified calculation approach (such as an AG43-like approach). Companies heading down this path will likely leverage the work products of the ARWG and the discussions with the Life Actuarial Task Force."

To clarify, the ARWG has not developed any tools that address an AG43-like approach nor has the ARWG discussed such an approach with LATF.

The authors regret the issues noted above and any confusion they may have caused regarding the role of the AAA ARWG with regard to this topic. We look forward to continuing to follow the development of this topic and appreciate the efforts of the AAA to serve the actuarial profession.

The views expressed herein are those of the authors and do not necessarily reflect the views of, Ernst & Young LLP. ■

Kush Kotecha is a manager in the Insurance and Actuarial Advisory Services practice of Ernst & Young LLP's Financial Services Office. Kush is based in Chicago.

Ben Yahr is a manager in the Insurance and Actuarial Advisory Services practice of Ernst & Young LLP's Financial Services Office. Ben is based in Philadelphia.

James Collingwood is an actuarial advisor in the Insurance and Actuarial Advisory Services practice of Ernst & Young LLP's Financial Services Office. James is based in Chicago.

Chairperson's Corner

By Matthew Clark

Matthew Clark, FSA, MAAA, CERA, is principal at Deloitte Consulting LLP in Chicago. He can be contacted at matthewclark@deloitte.com.

I am writing my submission to *The Financial Reporter* in September for an issue you are reading in December. I am reflecting on the changes that have occurred over the last year and all of the changes that will have occurred between now and the time you read this article. I will take some time to reflect on the contribution made by the Section Council members you elected, provide insight into the annual meeting events and consider the industry activities before us.

SECTION COUNCIL MEMBERS

I must start this article with a thank you to the council members whose elected term of service has come to an end. Rob Frasca is departing after leading the council as the chair over the last year. As I hope to declare next year, Rob has left the section in a better place than when he started. Mark Alberts and John Roeger are also at the end of their elected terms. Mark spent the last year focusing his time as the Research Team chair. As you already know, the Financial Reporting Section spends a lot of time and resources supporting the industry in the area of research. John has spent his time in support of education and webcasts. The Financial Reporting Section has been very active in the webcast space over the last year. By my last count, there will have been approximately 10 webcasts supported by the section over the last year. All three of these individuals volunteered a significant portion of their time and brought a passion to the council that will be missed.

With the departure of some comes opportunity for others. I am excited to welcome the newly elected members to the section council. Tara Hansen, John Esch and Jim McWilliams have been elected and will be serving the section over the next three years. I am excited to work with them as well as the returning members of the council.

Service to the industry is a subject that energizes me. While participation on the SOA section councils is an important role, there are many other efforts for which our members have provided support. I don't have the space or time to provide an exhaustive list, but do want to take a moment to thank everyone who contributes their time and energy to all of the initiatives. I am always humbled by the time, commitment and energy brought by the volunteers—the backbone of the actuarial profession.

ANNUAL MEETING

The annual meeting in Washington, D.C. metro area, is an important time for the SOA sections. At that time, we will welcome the newly elected members to the council and plan our strategy for the coming year. A summary of the strategy decisions will be shared in the next issue of *The Financial Reporter*.

Another tradition that will occur during the annual meeting Financial Reporting Section breakfast is the passing of the green jacket. For those of you not familiar with this tradition, the outgoing chair of the section wears the jacket at the annual meeting up until the breakfast. At that time, the jacket is passed to the new chair, who wears the jacket the remainder of the meeting. As the section representative on the annual meeting planning committee, I took the liberty to move the breakfast to the last day.

I am also excited about the meeting sessions. As a member of the planning committee, I have had the opportunity to help design the sessions. With so many changes facing the profession, I am confident you will find the content and the presenters enlightening.

INDUSTRY DEVELOPMENTS

To say we are living in exciting times is an understatement. The economic challenges coupled with the changes in the regulatory environment have and will continue to stimulate challenges and change in the actuarial profession. I reviewed the topics in this publication, SOA meeting sessions and recent webcasts. The recurring themes include:

- The low interest rate environment;
- Regulatory changes (International Financial Reporting Standards, Principle-Based Reserves, Solvency II, Own Risk and Solvency Assessment); and
- Modeling considerations.

All of the above topics are of interest to the Financial Reporting Section. I am confident we will have an active year. I promise to keep you informed of the accomplishments and focus of the section. Last, I encourage you to get involved in the section and the profession. ■

My point in all of this is that the groups I participate in that comment on standards (at last count there were five) don't approach this from how can they manipulate results but what would be the best result for the industry, both users and preparers. I'm not always sure that all board members appreciate that.

In particular, actuaries have standards of practice that don't allow us to engage in earnings manipulation outside the boundaries allowed by accepted practice and that are an inevitable result of projecting future cash flows. The entire accounting standard being developed by the IASB and FASB depends on actuarial standards of practice for their success.

The IASB and FASB and their staffs need to develop a mutual respect with actuaries that will make this successful and not assume we have improper motivations. The International Actuarial Association (IAA) and the IASB recently signed a memorandum of understanding that was disappointing to me in that it did not include a recognition that actuaries can be relied upon to develop standards that would produce reliable projections. Nowhere did it say that accountants can rely on actuaries to produce acceptable experience assumptions.

This is regrettable.

SEPTEMBER MEETINGS

This quarter, neither board substantially discussed insurance contracts in July or August. In September, however, there were major issues discussed by the IASB and FASB.

Transition: Joint IASB/FASB Meeting

At the Insurance Working Group meeting in June, everyone agreed that transition was a key issue for the success of the project. The proposal in the original exposure draft would have resulted in life insurers showing negative earnings for many years, an unacceptable result. Accordingly, this was the subject of a detailed discussion by a joint meeting of the boards.

Measurement

The key issues on measurement are how to determine the remaining residual or single margin on contracts issued previously and how to determine the discount rate as of the date of issue for purposes of how much of the liability should be in OCI.

The discussion of the single/residual margin considered several alternatives, based on conversations with preparers and users. The possibility of measuring it based on fair value as of the earliest date of presentation was considered and strongly supported by several board members. However, the majority of the board recognized that determining the fair value would involve at least as much guesswork as estimating the margin based on the fulfillment method.

Therefore, the boards tentatively decided that when an insurer first applies the new insurance contracts standard, the insurer shall do the following.

1. At the beginning of the earliest period presented,

   a. Measure the present value of the fulfillment cash flows using current estimates at the date of transition (i.e., as of the earliest period presented, which could be as much as three years prior to the current date), and

   b. Account for the acquisition costs in accordance with their existing tentative decisions for acquisition costs and derecognize any existing balances of deferred acquisition costs.

2. Determine the single or residual margin at the beginning of the earliest period presented, as follows.

   a. Determine the margin through retrospective application of the new accounting principle to all prior periods, unless it is impracticable to do so.

   b. If it is impracticable to determine the cumulative effect of applying that change in accounting principle retrospectively to all prior periods, the insurer is required to apply the new policy to all contracts issued after the start of the earliest period for which retrospective is practicable (i.e., apply retrospectively as far back as is practicable).

c. For contracts issued in earlier periods for which retrospective application would normally be considered impracticable because it would require significant estimates that are not based solely on objective information, an insurer shall estimate what the margin would have been if the insurer had been able to apply the new standard retrospectively. In such cases, an insurer need not undertake exhaustive efforts to obtain objective information but shall take into account all objective information that is reasonably available.

d. If it is impracticable to apply the new accounting policies retrospectively for other reasons, an insurer shall apply the general requirements of ASC Topic 250-10/IAS 8 that are relevant to situations in which there are limitations on retrospective application (i.e., measure the margin by reference to the carrying value before transition).

The boards asked the staff to consider developing a constraint, or set of constraints, on the estimated amount of the single or residual margin. In addition, the FASB asked the staff to explore a practical expedient that might allow insurers to determine the margin based on the definition of portfolios during the retrospective period.

This first request shows the lack of confidence the boards have in actuaries to do a responsible job of estimating the proper value. If we had a better relationship between accountants and actuaries, such a request would not be necessary; the boards would simply rely on actuaries to derive an acceptable estimate. They could simply state that the estimate must be based on Actuarial Standards of Practice adopted by the IAA and this would be sufficient.

Determining the Discount Rate

The boards tentatively decided that, for those periods for which it would be impracticable to determine the discount rate that would reflect the characteristics of the liability, insurers shall determine the discount rate as follows.

a. Calculate the discount rate in accordance with the standard for a minimum of three years and, if possible, determine an observable rate that approximates the calculated rates. If there is not an observable rate that approximates the calculated rate, then determine the spread between the calculated rate and an observable rate.

b. Use the same observable reference point to determine the rate (plus or minus the spread determined in (a) if applicable) to be applied at the contract inception for contracts that were issued in the retrospective period.

c. Apply the yield curve corresponding to that rate to the expected cash flows for contracts recognized in the retrospective period to determine the single or residual margin at contract inception.

d. Use the rate from the reference yield curve reflecting the duration of the liability for recognizing interest expense on the liability.

e. Recognize in other comprehensive income the cumulative effect of the difference between that rate and the discount rate determined at the transition date.

Transition Disclosures

The boards tentatively decided that insurers shall make the disclosures required by ASC

CONTINUED ON **PAGE 8**

Topic 250-10/IAS 8. In addition, insurers shall make the following, more specific, disclosures:

a. If full retrospective application is impracticable, the earliest practicable date to which the insurer applied the guidance retrospectively;

b. The method used to estimate the expected remaining residual or single margin for insurance contracts issued before that earliest practicable date, including the extent to which the insurer has used information that is objective, and separately, the extent to which the insurer has used information that is not objective, in determining the margin; and

The IASB decided that it would not explore further disclosures about the effect of regulation on reported equity in the insurance contracts project.

c. The method and assumptions used in determining the initial discount rate during the retrospective period.

The boards also tentatively decided that an insurer need not disclose previously unpublished information about claims development that occurred earlier than five years before the end of the first financial year in which it first applies the new guidance. Furthermore, if it is impracticable, when an insurer first applies the guidance, to prepare information about the claims development that occurred before the beginning of the earliest period for which the insurer presents full comparable information, it shall disclose that fact. (This decision confirms the proposal in the IASB's exposure draft.)

IASB-Only Meeting

Residual Margin: Accretion of Interest

The IASB tentatively decided that, consistent with the proposals in the original exposure draft (ED):

- An insurer should accrete interest on the residual margin, and
- The rate used for the accretion of interest should be the discount rate of the liability determined at initial recognition, i.e., a locked-in rate.

Disclosures

The IASB tentatively agreed with the disclosure package as set out by the staff in Agenda Paper 16F "Disclosures: Overview and Proposed Drafting," including requirements that insurers should:

a. Disclose gains or losses arising on contract modifications, commutation or derecognition;

b. Provide reconciliations between the opening and closing carrying amounts of insurance contract liabilities and insurance contract assets, including information about the carrying amounts of onerous contract liabilities recognized in the precoverage period; the expected present value of fulfillment cash flows, the risk adjustment and the residual margin; and

c. Disclose amounts payable on demand in a way that highlights the relationship between such amounts and the carrying amount of the related contracts.

The IASB tentatively decided not to add more guidance on the level of disaggregation of the reconciliation of carrying amounts beyond the requirements to (a) consider the level of detail necessary to satisfy the disclosure objective, and (b) to aggregate or disaggregate data so that useful information is not obscured by either the inclusion of a large amount of insignificant detail or the aggregation of items that have different characteristics.

The IASB tentatively decided to delete the specific disclosure proposed in paragraph 89 of the ED about contracts for which uncertainty about the amount and timing of claims payments is not typically fully resolved within one year.

The IASB decided that it would not explore further disclosures about the effect of regulation on reported equity in the insurance contracts project.

Review Draft or Re-expose

This was a very important discussion from the perspec-

tive of the industry. A decision not to re-expose would have meant a final standard would be available much sooner.

Although the deliberations on the insurance contracts project are not yet complete, given the stage of the deliberations and the desire to provide greater certainty to the market, the IASB discussed whether the IASB should proceed to an international financial reporting standard (IFRS) as its next step, perhaps with a review draft being made publicly available, or publish a revised exposure draft. The IASB discussed the progress that has been made on the insurance contracts project, and acknowledged the length of time that has been devoted to the project and the importance of issuing a final standard in a timely fashion. The IASB discussed the substantive nature of the changes made since the ED and the importance of evaluating each change within the context of the overall model. The IASB also considered the importance of obtaining constituents' input on targeted areas and of adjusting the model, if necessary, as a result of that input. On balance, the IASB decided to publish a revised exposure draft of the proposals on accounting for insurance contracts but to seek feedback only on the following issues:

1. The requirement that the cash flows used to measure participating contracts should be based on the cash flows used to account for the underlying items (mirroring approach);

2. The requirement to present premiums in the statement of comprehensive income, which has two consequential decisions:

   i. The part of the premium that relates to investment components is excluded from the premium presented in the statement of comprehensive income, and
   ii. The premiums are allocated in the statement of comprehensive income on an earned basis (to be discussed at a future meeting);

3. The requirement to use the residual margin to offset changes in estimates of future cash flows (unlocking);

4. The requirement to present in other comprehensive income changes in the discount rate used to measure the insurance contract liability; and

5. The proposed transition requirements, including the tentative decisions made at the September meeting as well as those that will be made at future meetings.

While the IASB noted that the exposure draft would include the full text of the proposed standard, it would also be necessary to clearly inform stakeholders that, after re-exposure, the IASB does not intend to revisit aspects of the proposed standard other than those targeted areas set out above.

The American Academy of Actuaries and the IAA will both comment on the exposure drafts the boards produce. I hope the boards will pay attention because, as we know:

Insurance accounting is too important to be left to the accountants! ■

Henry W. Siegel, FSA, MAAA, is vice president, Office of the Chief Actuary with New York Life Insurance Co. He can be reached at henry_siegel@newyorklife.com.

A Tale of Two Formulas: Solvency II SCR and RBC

By Mary Pat Campbell

Mary Pat Campbell, FSA, MAAA, is VP, insurance research at Conning in Hartford, Conn. She can be reached at marypat.campbell@gmail.com.

For the past decade, Solvency II has been developing in Europe to update approaches to insurer capital requirements, amongst other issues with respect to insurance regulation. In July 2008, in response to Solvency II (and then reacting to other regulatory developments in the wake of the financial crisis), the National Association of Insurance Commissioners (NAIC) kicked off its Solvency Modernization Initiative (SMI). As the end of 2012 approaches, most major decisions surrounding calculations for required capital have been finalized, though some details are still open for development. Below, I will examine the central formulas and look at their underlying assumptions.

THE CAPITAL FORMULAS

The core life authorized control level risk-based capital (ACL RBC) formula is as follows:

$$ACL\ RBC = C_0 + C_{4a} + \sqrt{(C_{1o} + C_{3a})^2 + (C_{1cs} + C_{3c})^2 + C_2^2 + C_{3b}^2 + C_{4b}^2}$$

The core formula for the Solvency Capital Requirement (SCR) under Solvency II is:

$$Basic\ SCR = \sqrt{\sum_{i,j} \rho_{i,j} \cdot SCR_i \cdot SCR_j}$$

The more complete SCR requirement includes a separate operational risk charge, but I will not deal with that issue here. Let us ignore what the individual components mean, other than the various C amounts are risk charges for particular risk categories, such as credit risk or mortality risk. We can see from the forms that there are similarities between the two types of formulas.

However, the surface similarities go away when one looks into the assumptions that have gone into developing the various components and the formulas themselves. To begin with, there is a top-down vision of the Solvency II SCR: It is defined as being the one-year value at risk (VaR) at the 99.5 percent confidence level. One starts at this high-level concept and then drills down to modules and submodules of risk that conform to this vision. One could have a full internal model to simulate the losses to get a multivariate VaR, but, in general, one would have separate individual models that have their results aggregated as noted in the formula above.

On the other hand, U.S. RBC is more of a bottom-up calculation in its core concept. There is no specific time horizon or risk metric that is specified, much less a specified confidence level. As the RBC formula has been updated, it has been at the component level, with various pieces having their own calibration points, not necessarily in conjunction with any other factors seen in the equation. The method for updating RBC has been one of incrementalism, with new factors being targeted to very specific risks and/or lines of business. The projects have involved targeting missing risks or outdated factors. For example, the C3 Phase II project to determine C3 (asset-liability mismatch risk) for variable annuities with guarantees, was intended to recognize risks that had been poorly captured by prior factors. To that end, as part of the SMI, the NAIC has already designated certain areas of the formula needing updating, such as the need for an explicit catastrophe risk charge in the P&C RBC formula and also to recalibrate asset risk factors and provide a different granularity than that which existed before.

RISK METRIC AND CONFIDENCE LEVEL

Let us first consider the risk metrics used in these formulas. As noted above, Solvency II SCR uses the VaR metric, which gives the potential loss in value over a defined period for a given confidence level. In this case, the confidence level is 99.5 percent, so it is expected that there would only be a 0.5 percent chance for capital set at this level to be fully depleted.

Considering that last sentence, one can see the primary strength of the VaR metric: It is easy to interpret and has a clear connection to probability of insolvency (defined as capital depletion). In addition, a lot of mathematical and computational machinery has been built to calculate VaR speedily. Much of this was originally developed for banking risk management.

However, there is a glaring problem with VaR, especially if one is a regulator concerned with what happens when insurers fail. The VaR metric only looks at how bad it can get up to a certain failure probability;

it does not reveal anything about the shape of the loss distribution beyond that point. This is akin to a black hole's event horizon—one can observe the effect of a black hole outside that range, but, once inside, there is no clue what is going on.

The issue of "risk blindness" past the confidence level specified has caused problems in the financial world before, most notably with collateralized debt obligations (CDOs). "Fat-tailed" risks means that, when things go bad, they can go catastrophically bad. If one is a regulator, one wants to make sure that, in the case of insolvency, policyholders are relatively well protected. A catastrophic insolvency whereby other insurers could not assume the liabilities in question is the almost-worst-case scenario for regulators. The worst-case scenario would be a catastrophic collapse of the entire insurance industry.

On the NAIC RBC side, there is no single risk metric that has been used. In some of the cases, a VaR metric was used to develop factors; in other cases, there was no specific metric per se. Recent projects to update life RBC calculations have used a conditional tail expectation (CTE) approach that looks at the expected value past the VaR loss. While this metric does address the risk blindness problem, the interpretation of the result is more difficult to convey. That said, the CTE metric has other nice properties, such as subadditivity (where two separate risks do not become more risky simply from combining them together; VaR fails with respect to subadditivity) as well as smaller confidence intervals for the same number of scenarios when one is estimating the metric using Monte Carlo techniques.

RISK AGGREGATION

Though theoretically the SCR is a top-down measure, generally modeling all risks at the same time and determining the loss at the proper percentile is untenable. Thus, many would use the BSCR formula as noted above, where module or submodule VaR is calculated, and then aggregate using correlation coefficients (whether developed on their own or using standard correlations).

This approach is sometimes called the variance-covariance approach to capital calculations, and it is equivalent to using a Gaussian copula for modeling the dependencies of the separate risk modules. Copulas are a method for combining single-dimensional probability distribution into a multidimensional distribution by using arbitrary marginals (the individual risks independently modeled) and using the structure from some standard distributions. Gaussian copulas are particularly popular in risk modeling, but they have a pitfall: tail independence. Tail independence shows up as a measure of probability that two extreme events occur simultaneously (in the case of a two-variable copula); as you're pushed out further and further into the tail, Gaussian copulas show these extreme events to be independent. One can see how this might underestimate the "true" VaR.

The NAIC RBC formula is a bit more extreme, in that the implied correlations in the formula are either 0 (total independence) or 1 (perfect correlation). Assuming total independence may underestimate the impact of combined risk and assuming perfect correlation may overestimate it.

TIME HORIZON

U.S. RBC does not specify a time horizon for its risk charges, while Solvency II SCR has a time horizon of one year for all risks. In commenting on this as part of RBC reviews in the SMI, NAIC working groups have noted that different time horizons may be appropriate for different risks as they develop over time. A Conning analysis of capital adequacy models commented on the importance of the time horizon with respect to risk capital measures:

> Risk can look very different over time. A risk that can dominate the risk landscape over a short time horizon can be more benign over a longer time horizon. For example, small unanticipated changes in medical inflation might require only a small portion of the total required capital over a short time horizon. Over a longer time horizon, the impact of unanticipated changes in medical inflation will compound while other risks, such as catastrophe frequency, will diversify. Therefore, a single economic capital metric is a current-point-in-time measure that does not consider how risks interact over many different time horizons. They view risk over a single time horizon. It is important to under-

CONTINUED ON **PAGE 12**

> stand how these risks interact and aggregate over different time horizons to understand the appropriate level of capital to hold. (Painter and Isaac, "A Stakeholder Approach to Capital Adequacy")

The time horizon is really only relevant for solvency measurements that use cash flow modeling. The RBC approach offers only a point-in-time assessment of capital levels and is essentially a retrospective view of capital. The Solvency II approach uses a one-year capitalization time horizon.

While an improvement over the retrospective view of capitalization, the models focused on a one-year horizon, by definition, are not designed to view the business on a multiyear/going-concern basis. The problem with the one-year view is that it misses latent, developing risks that build over time to affect capital.

As the NAIC has been adding projection elements to the RBC calculation for life products, the time horizon used for calculations have taken longer-term points of view, usually running out the liability model until the entire liability has essentially run off. There are issues with this approach as well, as one needs to project out many life liabilities for decades before run-off is complete. This means that one must also be able to model very long-term reinvestment strategies in addition to projecting mortality and policyholder behavior trends. There is a lot of model uncertainty with such long-term projections and, of course, certain company actions—such as changing investment or dividend strategy—will be influenced by actual developments that may be difficult to incorporate into a cash flow projection model.

That said, while having a theoretically infinite time horizon is troublesome, in practical terms, nearer-term cash flows generally dominate should the company be in a weakened position with regard to reserves and capital backing a particular line of business. Perhaps an intermediate time horizon, such as a five-year period, may help bridge the gap between the multiyear development of trouble as well as the practical problems with overly long horizons.

The time horizon is really only relevant for solvency measurements that use cash flow modeling.

INTERNAL MODELS

Finally, one major distinction between the approaches to capital requirements is the use of internal models. While there has been recent development of principles-based approaches for determining life RBC, on the whole, the set of factors being used are the same across the industry.

While understanding the need to modernize approaches to risk capital for complicated products, which involves the use of fairly sophisticated models, regulators in the NAIC have hesitated to grant free rein to insurers. In addition to stochastic simulation to capture tail risks, regulators have required standard scenarios to be run, in order to provide a floor for the results. In standard scenarios thus prescribed, there are no choices allowed on the part of the insurer; for many insurers, these standard scenarios have been found to dominate over the stochastic risk measure.

In a 2009 Networks Financial Institute policy brief by Therese M. Vaughan, the wariness toward the use of internal models was stated:

> A second feature of the U.S. system is the significant safeguards that have been built into the introduction of internal models. A healthy skepticism of internal models by some states resulted in the NAIC's incorporating a standard scenario into its capital requirement and reserving standards for variable annuities. The standard scenario is a single scenario with specified assumptions independent of a specific company's experience. That is, while the insurer is permitted to calculate its required capital and reserves using internal models with its own inputs, it must also calculate them using a standard deterministic scenario provided by the regulators. This scenario serves as a floor for the reserves and required capital. According to the NAIC's Life and Health Actuarial Task Force,

> the standard scenario assumptions are not intended to produce requirements that would be adequate most of the time. Rather, they are to ensure that the requirements are not unreasonably low, particularly given the lack of experience in applying internal models in this context. Regulators see the standard scenario as providing reasonable constraints to the flexibility given to actuarial judgment when doing stochastic modeling. (Vaughan, "The Implications of Solvency II for U.S. Insurance Regulation," *Networks Financial Institute*, February 2009.)

On the other hand, the ability to use internal models, or even be required to use internal models, has been a notable feature of Solvency II. The European insurance industry has conducted a series of five quantitative impact assessments (QIS1-QIS5) to gauge the adequacy of insurer capital levels under the new rules. The fifth and most recent of these showed that just under 5 percent of participating firms did not meet the minimum capital requirement (MCR) and 15 percent did not meet the SCR. (The MCR is the level at which there will be aggressive supervisory intervention and is defined to be the 85 percent one-year VaR amount. There is a further constraint that the MCR must be between 25 percent and 45 percent of the SCR.) The concern is that large, diversified groups with advanced internal modeling capabilities—using their own models—will find their capital requirement improved relative to Solvency I, but small insurers applying the standard formula will face a requirement for a capital increase.

EQUIVALENCE?

While the features noted above are rather set, there is one large, looming issue surrounding SMI and Solvency II: How will the U.S. regulatory system be considered under the new regime?

The issue ranges much farther than just capital requirements, but capital (and reserving) requirements may have the most immediate effect. If capital requirements for European Union-domiciled insurers with U.S. subsidiaries are much higher than that for their U.S. competitors, they may need to exit particular lines of business or consider redomiciling in a country with a more salutary regulatory regime. The U.S. market has already seen the exit of Canadian insurers from particular lines due to Canadian requirements being more stringent than those of the United States.

As of the writing of this article (September 2012), there have only been three regulatory regimes evaluated by the European Insurance and Occupational Pensions Authority (EIOPA), the EU parallel to the NAIC: Bermuda, Japan and Switzerland. The U.S. system has not been reviewed in the same manner, partly because there had been no formal request, but also because the reality of how the U.S. market is regulated, on the state level, does not fit within the national-level supervision envisioned under Solvency II.

As noted in the head-to-head comparison above, there are substantial differences between the approaches. The papers cited in the "Further Reading" section below illustrate that the numerical results can also be substantially different. Ultimately, the determination of "equivalence" under Solvency II is a political one, as it will be the various political bodies (as opposed to regulatory bodies) that will make the final call. Individual countries within the EU may make separate determinations. It will be interesting to see whether Solvency II, a project intended to produce regulatory convergence, provides impetus for regulatory arbitrage.

FURTHER READING

Herzog, Thomas N. "Summary of CEIOPS Calibration Work on Standard Formula." Jan. 5, 2011. http://naic.org/documents/index_smi_solvency_ii_calibration.pdf.

Jean, Steeve, Seong-min Eom, and Patricio Henriquez. "Solvency II Update—QIS5 Results." *The Financial Reporter* June 2011. http://www.soa.org/library/newsletters/financial-reporter/2011/june/frn-2011-iss85.pdf.

Painter, Robert A., and Dan Isaac. "A Stakeholder Approach to Capital Adequacy." Actuarial Practice Forum May 2007. http://www.soa.org/library/journals/actuarial-practice-forum/2007/may/APF0705_01.pdf.

Sharara, Ishmael, Mary Hardy, and David Saunders. "A Comparative Analysis of U.S., Canadian and Solvency II Capital Adequacy Requirements in Life Insurance." November 2010. Society of Actuaries research. http://www.soa.org/research/research-projects/risk-management/research-study-intl-regimes.aspx.

———. "Regulatory Capital Standards for Property and Casualty Insurers under the U.S., Canadian and Proposed Solvency II (Standard) Formulas." November 2010. Society of Actuaries research http://www.soa.org/research/research-projects/risk-management/research-study-intl-regimes.aspx.

Vaughan, Therese M. "The Implications of Solvency II for U.S. Insurance Regulation." Networks Financial Institute Policy Brief 2009-PB-03, February 2009. http://www.naic.org/Releases/2009_docs/090305_vaughan_resentation.pdf.

Revenue Recognition for Insurance Contracts – Part 3

By Jim Milholland

Jim Milholland, FSA, MAAA, is a retired partner from Ernst & Young, LLP. He can be contacted at actuary@milholland.com.

This is the third in a series of articles about revenue recognition for insurance contracts. The articles address revenue recognition for those contracts that are measured by the building blocks approach under the emerging new standards for insurance that are being developed by the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) of the United States (collectively referred to as the boards).

The articles illustrate the topics using examples. The examples in this article draw on the illustration of a 20 year endowment contract found in the first article (*The Financial Reporter*, June 2012). As a reminder, the examples use a single (heretofore known as composite) margin, which is consistent with the FASB's proposals, but differs from the IASB's. The IASB favors a combination of a risk adjustment and a residual margin. Furthermore, in the examples, the margin is amortized without reflecting the time value of money, whereas the boards have decided that the amortization should reflect the time value of money. The amortization technique used in the examples was chosen for convenience and may not be in accordance with the final guidance. The conclusions in this article about revenue recognition are not affected by these differences.

The discussions in these articles are the author's views on the boards' direction with respect to revenue recognition for insurance contracts. At the time this is being written, the IASB and the FASB have not made final decisions about revenue recognition and the approach described here may or may not appear in the standards.

Of particular note is one of the differences between the proposals of the IASB and those of the FASB. The FASB does not favor adjusting the margin for the effects of experience differences or of a change in estimate of future cash flows that result from assumption changes. The IASB is in favor of making this adjustment. The examples in this paper illustrate approaches to revenue recognition for which the adjustment to the margin is made. In that regard the paper is aligned with the IASB's thinking. The essential concept that revenue is the amount released from the liability to provide for insurance benefits and expenses is nonetheless applicable to the approach favored by the FASB.

The second article (*The Financial Reporter*, September 2012) shows one possibility for presentation of comprehensive income when benefits differ from those projected. This article shows two additional possibilities and discusses the relative merits of the approaches. The article goes on to show possible treatment of premium differences. A final section of this article discusses the relationship of premiums to revenue.

COMPARISON OF APPROACHES TO PRESENTING THE EFFECTS OF EXPERIENCE DEVIATIONS

As has been the case throughout the series, the initial step in deciding how to treat experience differences is to reconcile the beginning liability to the ending liability, and then to develop the presentation of comprehensive income from the information in the reconciliation.

To reiterate, the purpose of the analysis of the movement in the liability is twofold:

- it shows how the liability progresses over the period, and
- it shows how revenue relates to the measurement of the liability.

Revenue is the amount extracted from the liability to compensate the insurer for the insurance coverage provided during the period. The compensation is the margin that is released plus the amount of expected benefits and expenses.

Table 1 shows a comparison of the movement in the liability under three different approaches for treating differences in experience. The original calculation, for which experience follows assumptions, is also shown for reference. As in the second article, the movement in the liability is separated into the movement in the present value of the cash flows and the movement in the margin.

Column A in Table 1 is the movement in the liability from the second article. The beginning value of future cash flows progresses with the expected elements of the movement, resulting in the amount that was the expected amount for the end of the year. The actual amount, which is calculated from the projection of future cash flows as of the end of the year, is different

Table 1
Comparison of the Movement in the Liability in Year 4

	Original	With Experience Differences		
		A	B	C
	Expected Basis	Expected Basis	Actual Repayments, Expected Deaths	Actual Repayments, Actual Deaths
Movement in the present value of future cash flows				
Beginning PVFCFs	70,947	70,947	70,947	70,947
plus premium	25,144	25,144	25,144	25,144
plus interest credited	4,784	4,784	4,784	4,784
minus expenses	406	406	406	406
minus insurance benefits	505	505	505	253
minus repayments	5,358	5,358	3,209	3,209
PVFCFs moved forward with contributions and withdrawals	94,606	94,606	96,756	97,009
Change in estimate or G/L	0	2,026	-123	-376
Ending PVFCFs	94,606	96,633	96,633	96,633
Margin				
Beginning margin	7,825	7,825	7,825	7,825
margin released	437	437	437	437
change in estimate, or G/L	0	-2,026	123	376
difference in repayments	0	2,150	0	0
Ending value	7,388	7,511	7,511	7,764

from the expected amount because there have been fewer deaths and fewer terminations than had been projected. The difference is characterized as a change in estimate. The margin is adjusted for the change in estimate. There is a further adjustment to the margin for the difference between the actual and the expected repayments. The term "repayments" refers to cash surrenders and maturities, in keeping with the term adopted with the FASB and IASB staffs. The second adjustment is made to avoid recognizing a gain for the difference between actual and expected repayments. The rationale for deferring the gain rests on the belief that there should not be a gain on the deposit element of insurance contracts. Support for the reasonableness of the adjustment also comes from the observation that the revenue recognized over the life of the contracts appears to be distorted, as compared to the revenue that is recognized in the hindsight calculation.

Perhaps the approach in Column A places too much emphasis on the progression of the model. For example, it makes sense to see that the liability grows with the actual premium payments, not the expected premiums. (Treating the difference between actual and expected premiums is discussed in the next section.) Similarly, the liability should be reduced by the actual repayments, not the expected repayments. The approach in Column B shows the movement in the liability using the actual repayments rather than expected.

CONTINUED ON **PAGE 16**

Using actual repayments avoids the appearance of a potentially large gain or loss from differences in actual from expected terminations and obviates the need to make an adjustment to the margin to offset the gain or loss. The adjustment to the progressed number to get the ending PVFCFs is the net gain from experience differences. The insurer has paid less than it expected and is therefore holding onto more cash and the additional liability it needs to provide for the additional contracts is less than the cash value. The difference is the gain for the period.

The issue to be resolved is which presentation is most appropriate to show in the performance statement. Critics of the approach in Column B will state that it obfuscates a potential significant difference between actual and expected cash flows. Proponents of the approach in Column B will counter with the argument that the important differences are those that relate to the insurance component, and that it is only the quantum of the premiums and the repayments that is important, not the difference to expected amounts. The differences can of course be disclosed elsewhere.

As noted, Column B shows the movement in the liability using expected deaths rather than actual deaths. Having argued that the movement in the value of future cash flows should be analyzed with actual repayments, perhaps the movement should show the actual benefits as well. This approach is found in Column C. The effect of showing only actual amounts is that the difference between actual and expected benefits does not affect net income for the period. It is taken to the margin and effectively spread over the remaining periods. This smoothing of the effects of experience differences is not likely to be agreeable to the boards.

ANALYSIS OF THE DIFFERENCES

It is insightful to see how the adjustment to the progressed number to get the PVFCFs can be explained as something other than simply the difference between two numbers. In the original calculation, the PVFCFs at the end of the period is 94,606. The number of contracts is 7,865, so the value per contract is 12.2867. In Column A, because there have been fewer deaths and fewer terminations than expected, there are 165 more contracts than expected (164.919872 more contracts, to be precise). The value per contract is the same as in Column A because the inputs, or assumptions, are unchanged. So the change in estimate is the difference in the number of contracts times the value per contract. 16.919872 x 12.2867 = 2,026.

Column B uses the actual repayments for the progression. Since the liability is different from the cash values, there is a gain from the effects of paying less than expected but keeping only the PVFCFs on the remaining contracts. This gain is the number of contracts leaving (by death or by surrender) times the difference between the cash value per contract and the PVFCFs per contract. This difference is 0.748325 per contract, which when multiplied by 165 makes 123.

The adjustment in Column C is the same as in Column B plus the difference between the actual and expected death benefits.

In all three approaches, the PVFCF is the same at the end of the period. They differ in the path from the beginning value to the ending value. In A and B the margin at the end of the period is the same. In C the margin is different.

Table 2 (right, top) shows a comparison of the performance statement under the approaches.

The approaches in Column A and Column B create the same bottom line. The net income for the period is different from the originally expected amount by the difference in death benefits.

In Column C, this difference in death benefits is taken to the margin and not reported in the current period. The difference is spread over the remaining life of the contracts through the amortization of the margin. Revenue is lower in the current period and somewhat greater each year thereafter.

In all three approaches, the PVFCF is the same at the end of the period.

Table 2
Comparison of the Performance Statement in Year 4

	Original	With Experience Differences		
		A	B	C
	Expected Basis	Expected Basis	Actual Repayments, Expected Deaths	Actual Repayments, Actual Deaths
Revenue	1,348	1,348	1,348	1,095
Investment income	5,299	5,299	5,299	5,299
Benefits	505	253	253	253
Interest credited	4,784	4,784	4,784	4,784
Expenses	406	406	406	406
Net income	952	1,204	1,204	952
Difference to Original	0	253	253	0

Total revenue is the same over the life of the contracts for all three of the approaches to experience differences.

PREMIUM DIFFERENCES

Up to this point the experience differences considered in the examples have been differences between actual and expected benefits or actual and expected repayments. The next example addresses the possibility that premiums actually paid are different from expected.

This example considers the possibility that less premium is paid, but the lower payments do not result in any contract terminations; i.e., the number of contracts terminating is the same as originally expected. Contracts do not terminate for nonpayment of premiums, for example, when policyholders elect paid-up options, when they use premium loans, or when they take advantage of the flexible-premium feature found in universal-life type contracts. In fact, for the last possibility, premiums can be greater than expected, although this possibility is not considered in the examples.

The examples use the approach in Column B of the first example for treating the difference in experience. This approach has the greatest appeal to the author because it shows the effect of a difference in premiums and repayments experience as a net gain or loss that is deferred by an adjustment to the margins, and allows the difference between actual and expected insurance benefits to affect net income for the year.

Consider the case when half of the policyholders pay 90 percent of the expected premium in the fourth year. The number of contracts is not affected by the lower payment, but the cash values are less that they would have been if the expected amount of premium had been paid. There is no difference between the actual and expected number of deaths and cancellations. The lower premium payment does affect benefits because there is a larger net amount at risk for the contracts that pay the lower premium than for the contracts that pay the amount of the initial premium each year throughout the life of the contracts.

Table 3 (pg. 18) shows a comparison of the movement in the liability for the fourth year for the contracts that pay only the full premium each year (the original scenario), the movement in the liability for the case when there is less premium in the fourth year than expected (the revised scenario), and the movement in the liability if it had been known from inception that half of the policyholders would pay 90 percent in the fourth year (the hindsight scenario).

The revised scenario shows that the lower premium results in less interest credited, a slightly larger death

CONTINUED ON **PAGE 18**

benefit, and smaller repayments. The net effect is a loss on experience, which is deferred by an adjustment to the margin.

In the previous example (Table 2), revenue is not affected by the experience difference. In this example, there is an effect on revenue. The difference results from the assumed timing of the difference and, accordingly, from the gain or loss on experience. The model has taken the customary approach for analyses of these types that premiums are paid at the beginning of the year and benefits and repayments occur at the end of the year. When the experience difference relates to a difference in the amount of premium that is paid from that which was expected, the gain or loss occurs at the beginning of the year. The margin is adjusted as of the beginning of the year and hence revenue for the year is affected. In practice actuarial models reflect that premiums are paid throughout the year and that benefits and repayments can occur at any time, not just at year end.

Table 3
Comparison of Movement in the Liability in Year 4 When There are Premium Differences

Movement in discounted cash flows	Original	Revised	Hindsight
Beginning value	70,947	70,947	71,063
plus premium	25,144	23,887	23,887
plus interest credited	4,784	4,727	4,727
minus expenses	406	406	406
minus insurance benefits	505	506	506
minus repayments	5,358	5,296	5,296
Progressed value	94,606	93,353	93,469
gain or loss on experience	0	116	0
Ending value	94,606	93,469	93,469
Margin			
Beginning margin	7,825	7,825	7,742
margin released	437	429	431
gain or loss on experience	0	-116	0
Ending value	7,388	7,280	7,312
Total liability	101,994	100,749	100,781

Table 4
Comparison of net income when there are premium differences

Year 4					
	Original	**Revised**	**Hindsight**	**Rev. - Orig.**	**Hind. - Rev.**
Revenue	1,348	1,340	1,342	-8	2
Investment income	5,299	5,236	5,236	-63	0
Benefits	505	506	506	1	0
Interest credited	4,784	4,727	4,727	-57	0
Expenses	406	406	406	0	0
Net income	952	938	940	-14	2
Year 5					
	Original	**Revised**	**Hindsight**	**Rev. - Orig.**	**Hind. - Rev.**
Revenue	1,395	1,388	1,390	-7	2
Investment income	6,445	6,382	6,382	-63	0
Benefits	540	541	541	1	0
Interest credited	5,905	5,848	5,848	-57	0
Expenses	385	385	385	0	0
Net income	1,011	996	998	-15	2
Total					
	Original	**Revised**	**Hindsight**	**Rev. - Orig.**	**Hind.- Rev.**
Revenue	23,706	23,636	23,652	-70	16
Investment income	218,054	216,962	216,962	-1,092	0
Benefits	8,761	8,807	8,807	46	0
Interest credited	203,347	202,405	202,421	-942	16
Expenses	6,050	6,050	6,050	0	0
Net income	23,602	23,336	23,336	-266	0

CONTINUED ON **PAGE 20**

Table 5
Movement in the liability in Year 4

Movement in discounted cash flows	
Beginning value	70,947
plus premium	25,144
plus interest credited	4,784
minus expenses	406
minus insurance benefits	505
minus repayments	3,209
change in estimate	-123
Ending value	96,633
Margin	
Beginning margin	7,825
margin released	437
change in estimate	123
Ending value	7,511
Total liability	104,144

Table 6	
Premium	25,144
minus change in liability	25,372
plus Interest credited	4,784
minus repayments	3,209
Revenue	1,348

THE RELATIONSHIP BETWEEN PREMIUMS AND REVENUE

One of the criticisms of the presentation of comprehensive income as it has been illustrated in this series of articles is that it does not show the amount of premium that has been received for the accounting period. Premium income and growth in premiums are important to the evaluation of insurers.

It is possible to show the relationship of premiums to revenue. Table 5 (left, top) refers back to Column B of Table 1 and shows the movement in the liability for year 4 when there has been an experience deviation.

Revenue is the sum of the margin released and the expected benefits and expenses. The complementary pieces in the movement of the liability are the premiums added, the interest credited and the repayments. With this in mind, one can reorder the movement in the liability and show revenue as the amount of premium in excess of the increase in the liability and the repayments, as shown in Table 6 (left, bottom).

The net of the change in the liability and the interest credited to the liability can be characterized as the amount that is added to the liability to provide for future benefits. Obviously, this number is sometimes negative, in which case it is the amount that must be withdrawn from liabilities to provide for future claims and repayments. This view is shown in Table 7 (right).

The analysis in Table 7 shows the premium information that users of financial statements have told the boards that they desire. It also makes clear whether the insurer is adding to liabilities or drawing on liabilities to make repayments and to compensate itself for the insurance coverage.

While there are benefits to showing this information, there are drawbacks as well. The analysis can lead the user to think that revenue is a part of the premium for the period. Revenue is not a part of the premium for the period, as is most clear for single premium contracts, for which the top line in this analysis is zero after the first year. It is important to keep in mind that revenue is the amount taken from the liability to compensate the insurer for the insurance coverage for the period. It can be seen as the amount of contribution to the liability

(the sum of premiums collected and interest credited) allocated to the period to provide for insurance benefits, as was discussed in the second article. Revenue in any period does not bear any necessary relationship to premiums collected in that period.

The analysis in Table 7 may be useful. On the other hand, it may be redundant if the analysis of the movement in the liability is disclosed, as is proposed by the boards. And, as noted, it may be misleading if it allows the user of the financial statement to conclude that revenue should be seen as a part of the current period's premiums.

Table 7

Premium	25,144
less amounts added to (withdrawn from) the liability to provide for future (current) claims and repayments	20,588
less repayments	3,209
Revenue	1,348

SUMMARY AND CONCLUSIONS

At the time this is being written there has been interest expressed by the IASB in the approach to revenue recognition that has been presented in these articles. Its appeal lies in the broad consistency with revenue recognition as it is defined in the emerging standard on that subject and in its linkage to the measurement of liabilities in the evolving insurance standard. It is nonetheless apparent that this approach is very different from approaches currently in use and it will take some getting used to. The approach is an improvement over current practices because it conveys better information about how insurers are compensated for the insurance benefits provided in contracts that cover multiple years or include significant deposit components.

The starting point of these papers has been that the presentation of comprehensive incomes is a function of the analysis of the change in the liability. Because this analysis is almost certainly going to be a required disclosure, the approach to the performance statement represents very little additional effort to actuaries and accountants preparing the financial statements. The argument that it is impractical and requires a significant additional amount of work is not valid. ■

PBA Corner

By Karen Rudolph

Karen Rudolph, FSA, MAAA, is a consulting actuary at Milliman Inc. She can be reached at karen.rudolph@milliman.com.

On August 2, the National Association of Insurance Commissioners (NAIC) Life Actuarial Task Force (LATF) adopted the Valuation Manual (VM) in its entirety. On August 17, the NAIC Life Insurance and Annuities (A) Committee also adopted the VM. During September and October 2012, LATF continued to hold conference calls on topics which remained open, primarily in VM-20, specifying the minimum reserve requirements for life insurance. On Dec. 2, 2012, during the NAIC Fall National Meeting, the required super-majority of NAIC members voted affirmatively to adopt the Valuation Manual.

Looking forward, both the Standard Valuation Law (SVL), as revised in 2009 to allow for a VM specifying principle-based reserves, and the VM itself are ready to be presented to state legislatures during calendar year 2013. Section 11 of the SVL details the necessary thresholds that must be met prior to the VM becoming operative. In addition to the super-majority affirmative vote of the NAIC, there must be same or similar legislation enacted by states representing 75 percent of the direct premium written in 2008 and same or similar legislation enacted by 42 of 55 jurisdictions. If all these thresholds are met by July 1, the VM becomes operative on the following January 1.

IMPACT STUDY PHASE III TESTING

Subsequent to the NAIC's VM-20 Impact Study, which was performed during 2010–11, the LATF acted on certain recommendations that came about because of the study. In July 2012, the American Council of Life Insurers (ACLI) set out to determine the impact of these recent changes to VM-20 by requesting that member companies use the Impact Study models and provide some of the same calculations from Phase I and Phase II, updating these where applicable for the changes implemented since then. For purposes of this article, the analysis is referred to as Phase III.

The data requested for the Phase III evaluation was a much-scaled down subset of the original NAIC Impact Study. Because the changes to VM-20 since Phases I and II primarily impact term insurance and universal life insurance with secondary guarantee (ULSG), the ACLI data request targeted those companies modeling these lines of business in the earlier phases. A brief review of the significant changes to VM-20 are listed below.

- **Net premium reserve (NPR) method for ULSG policies**
  The NPR calculation for ULSG policies, per VM-20 Section 3.B.6, is shown below. The NPR during the secondary guarantee period is the greater of this amount and the Section 3.B.5 NPR. The Section 3.B.5 NPR is the NPR for policies without secondary guarantees.

$$NPR\ Section\ 3.B.6 = Min\left[\frac{ASG_{x+t}}{FFSG_{x+t}}, 1\right] \bullet NSP_{x+t} - E_{x+t}$$

- **Asset Modeling**
  The LATF adopted reinvestment alternative 2[1] but with a more conservative cap on the assumed aggregate reinvestment rate used in the model. VM-20 Section 7.E.1.g specifies the minimum reserve must not be less than the minimum reserve that would be obtained by substituting an alternative investment strategy in which all fixed income reinvestment assets are public noncallable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of 50 percent PBR credit rating 6 (A2/A) and 50 percent PBR credit rating 3 (Aa2/AA). This change represents a more conservative requirement since the original cap was expressed as a 50 percent PBR credit rating 6 (A2/A) and 50 percent PBR credit rating 9 (Baa2/BBB) corporate bonds.

- **Mortality Assumption for Modeled Reserves**
  The mortality assumption for deterministic reserve (DR) and stochastic reserve (SR) calculations was modified to allow more recognition of company experience. A company can use its experience data for a number of years, where the number of years is dependent upon the sufficient data period. Grading in to the industry table (2008 VBT) is dependent upon the credibility of the experience data within the sufficient data period. The lower the credibility, the earlier the company must begin grading into the industry table. Refer to VM-20 Section 9.C for detail on mortality requirements.

The companies were asked to use the same model used in Phases I and II of the Impact Study in completing the data request for Phase III. This meant using the same asset and liability population files, the same scenarios

and the same assumption set. In this way, the revised results could be calibrated back to the Phase I and II results, allowing for the differences to be readily quantified as percentage changes in reserve.

The companies produced most, if not all, of the following data.

- Reserve amounts including NPR, DR and SR, for the one-year and five-year blocks of business, with and without reinsurance as applicable.
- Modeled reserves (DR and SR) over a series of mortality sensitivities including company experience mortality with improvement, company experience mortality without improvement, the VM-20 exposure draft requirement and the June 19 exposure version of the mortality requirement.[2]
- Modeled reserves ignoring explicit margins.
- Projected reserves beyond the five-year issue block to a 10-year and 15-year issue block; alternatively, a one-year issue block projected out to future years.
- Modeled reserves using an alternate set of scenarios; these scenarios reflect the June 30, 2012, U.S. Treasury rates and an updated mean reversion parameter in the economic scenario generator.

The interest rate environment has changed considerably since the Dec. 31, 2009, valuation date used in the Impact Study. For the last sensitivity listed above, the data request included a revised set of 1,000 scenarios that had been generated using the June 30, 2012, U.S. Constant Maturity Treasury curve and an updated mean reversion parameter. Both sets of data are shown in Table 1 for reference. Although the underlying scenarios were updated, consistent asset spread and default data was not available, and, as a result, the default and asset spread data used by the contributing companies were not necessarily consistent with the economic scenarios tested.

SUMMARY OF PHASE III OUTCOMES

As was expected, the modeled reserves (deterministic and stochastic) have decreased when comparing Phase III outcomes to Phase I. Anecdotal feedback from some participants indicate they believe this is largely driven by the changes in mortality requirements. As expected, term insurance blocks demonstrate a higher percentage decrease than do ULSG products. The range of percentage change in modeled reserves from Phase I to Phase III (using the LATF adoption version of mortality) on a direct basis for ULSG is -3 percent to -15 percent with one outlier at -30 percent. Similarly, for term insurance, the range is -25 percent to -80 percent. These amounts of change are not inconsistent with the amount of change seen in the Phase II mortality sensitivities.

Table 1

U.S. CMT	NAIC Impact Study Phases I and II December 2009	Phase III June 2012
3 Month	0.06%	0.09%
6 Month	0.20%	0.16%
1 Year	0.47%	0.21%
2 Years	1.14%	0.33%
3 Years	1.70%	0.41%
5 Years	2.69%	0.72%
7 Years	3.39%	1.11%
10 Years	3.85%	1.67%
20 Years	4.58%	2.38%
30 Years	4.63%	2.76%
Mean Reversion Parameter	5.25%	4.75%

A recommendation emerging from Phase I testing was to modify the NPR calculation for ULSG policies such that it represented a better statutory floor reserve. For the five ULSG companies producing data testing that recommendation, the NPR has decreased to varying degrees. The range of percentage change for NPR is -4 percent to -33 percent.

Because of the changes in the individual reserve components, the VM-20 minimum reserve is also shown to have changed from Phase I. The minimum reserve has decreased, but the component driving the minimum reserve (i.e., NPR, DR or SR) remains the same for most companies. Percentage changes in minimum direct basis reserve for ULSG blocks ranges from 0 percent to -13 percent and 0 percent to -25 percent for term insurance blocks.

How the VM-20 mortality requirements impact any given block or company depends upon the company's

CONTINUED ON **PAGE 24**

Table 2

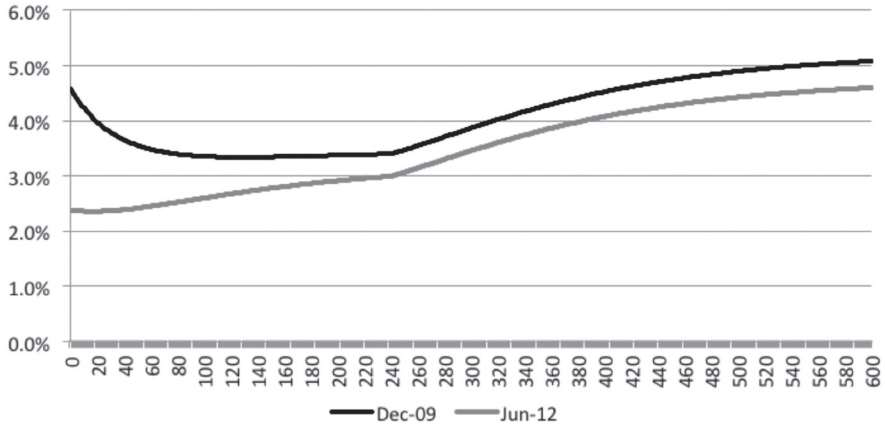
	Change in Direct Deterministic Reserve Mortality Attribution Sensitivity 5-Year Issue Block		
ULSG	Average	Min	Max
Remove qx Improvement	20%	9%	31%
VM-20 Mortality	31%	5%	96%
Total	42%	7%	127%
TERM INSURANCE			
Remove qx Improvement	87%	27%	230%
VM-20 Mortality	78%	11%	201%
Total	147%	38%	305%

credibility and sufficient data period. Table 2 (above) summarizes the outcome of the mortality attribution sensitivity. This is a multilevel sensitivity. The attribution starts with the DR using the company's best estimate mortality assumption. Progressive steps add layers of conservatism that can be quantified by comparing back to the reserve based on best estimate assumptions.

Table 3

	Change in Direct Deterministic Reserve Updating Scenarios to June 30, 2012, Sensitivity 5-Year Issue Block		
	Average	Min	Max
ULSG	26%	5%	67%

Table 4
20 Year US Treasury Rate from ESG
Scenario 12: Deterministic Scenario



Updating the scenarios to June 30, 2012, economic conditions produces material increases to modeled reserves when compared to baseline. Table 3 (left, middle) measures the percentage change in direct basis deterministic reserve from Phase I to Phase III over this sensitivity. The data set for term insurance included only two companies and is omitted.

The deterministic reserve is dependent upon one scenario, scenario 12 from the set of stochastic exclusion test scenarios. In the economic scenario generator (ESG), scenario 12 applies uniform downward shocks each month for 20 years, sufficient to get down to the 80 percent point on the distribution of 20-year shocks. After 20 years, shocks are at a level that keeps the cumulative shock at the 80 percent level.[3] Table 4 (left, bottom) depicts the 20-year constant maturity treasury rate from scenario 12 at December 2009 and at June 2012. This comparison of the deterministic scenarios provides context for the percentage change figures in Table 3.

In general, outcomes of the Phase III testing support the suggestion that the modifications made to VM-20 as a result of the NAIC Impact Study made progress in addressing the excessive conservatism demonstrated in the Phase I and Phase II testing. The LATF will continue to work on specific areas of VM-20 through 2012 and while the PBR package goes through the state legislative process.[4] ■

END NOTES

1 Alternative 2 is the method of determining the reinvestment asset return suggested by the American Academy of Actuaries and uses investment spreads over treasuries that grade from current spreads to historical averages. Alternative 1 was a more simplistic approach wherein reinvestment spreads were determined using a formulaic approach.

2 The June 19 version of mortality was the version briefly adopted in an exposure draft and suggested by LATF's member from Alabama.

3 VM-20, Appendix 1

4 Details of the outcomes of the Phase III testing for each participating company can be found in a report on the ACLI website.

ENTERPRISE RISK MANAGEMENT

ERM

Symposium

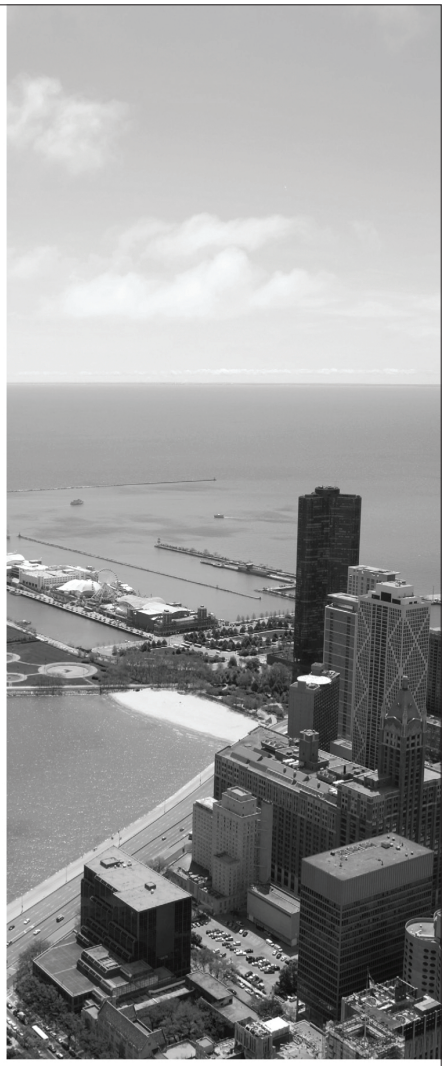
Where Cutting Edge Theory Meets State of the Art Practice

More than 400 executives, directors, and risk management experts gathered at the 2012 Enterprise Risk Management (ERM) Symposium in Washington, DC, to present the latest on ERM thinking and practices. Make sure you don't miss the next opportunity—our 2013 ERM Symposium—to learn from industry leaders about this emerging discipline and expand your ERM skills.

Highlights include:

- Top risk management experts offering their perspective on key risk issues
- Pre-Symposium seminars on ERM topics
- Networking opportunities to renew and expand your list of ERM contacts
- Exhibitors demonstrating their ERM services and knowledge
- Call for papers program showcasing new research

Visit **www.ermsymposium.org** to learn more about this global conference.



The 11th Annual Premier Global Event on ERM!

2013 ERM Symposium
April 22-24, 2013
Swissotel Chicago
Chicago, IL

Presented by the Casualty Actuarial Society, Canadian Institute of Actuaries, Professional Risk Managers' International Association and Society of Actuaries

Asociación Mexicana de Actuarios, A.C.

Colegio Nacional de Actuarios, A.C.

and with collaboration of the Asociacion Mexicana de Actuarios, Colegio Nacional de Actuarios, and Enterprise Risk Management International Institute.

Financial Reporting Research Scorecard

By Sam Keller

Sam Keller, FSA, MAAA, is an actuary at Allianz Life Insurance Co. in Minneapolis. He can be reached at sam.keller@allianzlife.com.

Research is a primary mission of the Financial Reporting Section and is the largest use of section dues. The section spent $141,000 in 2011 and anticipates spending $80,000 in 2012 on research. This scorecard will keep section members informed about research projects sponsored or cosponsored by the section.

Research initiatives in process (updated as of Sept. 21, 2012):

Project Name	Description
Monograph on Discount Rates	An IAA-sponsored monograph on the concepts and practical methods used in discounting across actuarial practice areas
Monograph on Risk Adjustment	A monograph addressing the of risk and uncertainty in the measurement of insurance liabilities
Comparative Failure Experience in the Insurance and Banking Industries	Identification of the factors that have been effective for the insurance and banking industries to reduce failure rates
Behavioral Economics Applications to Life and Health Insurance Policyholder and Annuitant Behavior	A call for papers to expand actuarial understanding of the theory of behavioral economics and its to insurance customer behavior
International Foreign Reporting Standards	Examines the impact to life insurance financial reporting of the upcoming IASB exposure draft on accounting of insurance contract liabilities

Recently published research of interest to Financial Reporting Section members:

Project Name
Premium Persistency Study of Flexible Premium Products
Credit Risk Modeling Techniques for Life Insurers
Volatility of Fair Value Accounting
Actuarial Modeling Controls

Research projects out for proposal:

Project Name	Proposal Due Date
PBA Practitioners' Guide	Q4 2012
Dynamic Policyholder Behavior	Q4 2012

Have an idea for a research project? Send it to Mark Alberts at mark@albertsactuary.com. ■

Targeted Completion	Status	Project Oversight Group (POG) Contact
TBD	Exposure draft issued with comments due by Nov. 8, 2012	Frank Grossman
TBD	An outline of proposed content has been delivered to the POG with further outreach to member groups planned to finalize content	Mark Yu
Q4 2012	The preliminary report is being reviewed by a range of subject-matter experts to include their feedback with the report	Larry Rubin
Q4 2012	Call for papers issued; papers are due Oct. 1, 2012	Ronora Stryker
TBD	Researchers are working with actuarial task forces to assemble financial statements under U.S. and IFRS bases	Tom Herget

Link
http://www.soa.org/Research/Research-Projects/Life-Insurance/research-premium-persist-assumptions.aspx
http://www.soa.org/Research/Research-Projects/Life-Insurance/research-credit-risk-mod.aspx
Check the Completed Research Projects section of the SOA website for details
Check the Completed Research Projects section of the SOA website for details

Link
Check the Research Opportunities section of the SOA website for details
Check the Research Opportunities section of the SOA website for details

Systemically Important Financial Institutions—An Insurance Perspective

By Satyan Jambunathan

This article is reprinted with permission from the January 2012 edition of Actuary India.

Satyan Jambunathan is the Head of Finance at ICICI Prudential Life Insurance Company. He can be contacted at satyan.jambunathan@iciciprulife.com.

BACKGROUND

Systemically Important Financial Institutions (SIFI) are defined as "Financial institutions whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity. To avoid this outcome, authorities have all too frequently had no choice but to forestall the failure of such institutions through public solvency support. As underscored by this crisis, this has deleterious consequences for private incentives and for public finances." The global financial crisis of 2008 brought to the fore the debate on "too big to fail." The crisis highlighted the costs of supporting systemically important financial institutions as well as the linkages both, between institutions as well as across countries. This prompted the , a group of the largest economies in the world, to come together and debate measures that needed to be taken to prevent recurrence of such problems. The tasked the Financial Stability Board (FSB) along with international regulatory associations such as the Basel Committee on Banking Supervision (BCBS), International Association of Insurance Supervisors (IAIS) and the International Organisation of Securities Commissions (IOSCO) to evolve frameworks for supervision of such SIFIs.

The mandate to the FSB included identification of criteria for determination of SIFIs, reviewing and suggesting modifications to current regulatory frameworks. It also included developing a model to deal with such failures in a way that normal financial activity is not disrupted. The FSB, since then, has brought out discussion papers and policy proposals to address the mandate. These models in essence seek to identify problems with Systemically Important Financial Institutions even before they become statutorily insolvent and also put in place a framework that could be adopted to deal with such instances in an orderly fashion.

Some important outcomes of these deliberations have been the publication of a comprehensive paper on Key Attributes of Effective Resolution Regimes for Financial Institutions, FSB, October 2011, Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement, BCBS, October 2011 and Intensity and Effectiveness of SIFI Supervision, FSB, October 2011. The FSB also published a progress report which contains a section from the IAIS covering developments in the Insurance industry.

DEVELOPMENTS IN THE INSURANCE DOMAIN

In November 2010, the Financial Stability Board (FSB), in consultation with the International Monetary Fund (IMF), released a report on Intensity and Effectiveness of SIFI Supervision (the SIE report). The SIE report observed that prior to the crisis, risk management processes at SIFIs were generally judged to be acceptable, but the crisis indicated otherwise. The report noted that supervisory work was often not geared "outcomes" but more focused on process and noted that supervisory expectations for SIFIs in particular needed to be augmented. The SIE report did not set out new supervisory rules and policies for SIFIs but set out 32 recommendations for making the supervision of financial institutions more intense, effective and reliable.

In September 2011, the International Association of Insurance Supervisors (IAIS) released a report on implementation of recommendations for enhanced supervision of insurance companies. The IAIS, through its member bodies which are national insurance regulators, provides a globally accepted framework for the supervision of insurance entities through a set of principles called the Insurance Core Principles (ICP). The IAIS report sets out changes that need to be made to these ICPs given the recommendations emanating from the SIE report.

The areas covered are as below:

1. Mandates

Mandates cover what the responsibilities and powers of the supervisor need to be. The report seeks to strengthen the need for primary legislation to clearly define the objectives and responsibilities of the supervisor. It also requires that supervisors have the authority and ability to intervene early enough to address a potential problem.

2. Independence

This essentially deals with requirements for the supervisor to be independent from the other stakeholders including governments, executive, judiciary as well as industry.

Notable changes include guidance that the supervisor should not manage or otherwise have any operational role in the functioning of the insurers that it supervises. It also seeks to address potential conflict of interest situations for members of the governing body of supervisors.

3. Resources
This primarily addresses the need for supervisors to have adequate staffing both in terms of number and quality to ensure the effectiveness of the supervisory process.

To address this, guidance and requirements have been added to the principles to ensure:

- adequate allocation of resources for both on-site and off-site monitoring
- processes are established to assess the potential systemic importance of insurers depth and quality of staff to support effective supervision given the nature, scale and complexity of the supervised entities
- depth and quality of staff to support effective supervision given the nature, scale and complexity of the supervised entities

It also adds guidance to address resource planning, skill enhancement including assignments in industry or across regulators and flexible hiring policies so that staff is better aligned to industry practices.

4. Supervisory Powers
The section on Mandates also addresses the point of Supervisory powers.

5. Improved Techniques
a) Focus on Outcomes
As discussed earlier, one of the key comments in the SIE report was the need to focus on outcomes in addition to focusing on processes. The IAIS now seeks to bring in greater focus on outcome assessment through various principles and guidance related to enterprise risk management and the need for the supervisor to validate that the assessment of risks for different lines of business is appropriate. The objective is also to evaluate the level of capitalization required to deal with a range of stress scenarios for each supervised entity.

b) Horizontal Reviews
Horizontal reviews deals with the need to use information collated from various other sources in addition to normal submissions, including qualitative and quantitative information, to ascertain the state of affairs at the supervised entities.

c) Assessment of Boards
Changes have been made to emphasise the governance structures including the Board to ensure that systemically important entities are managed with a rigour which is commensurate with their importance in the system.

d) Financial Statement Analysis
Guidance has been added to ensure that supervisors promptly analyse financial information received from insurers so that they develop a deeper understanding of emerging trends affecting an insurer, its risk appetite and the effectiveness of its strategy.

e) Business Models and Product Analysis
No changes are considered necessary in this area.

f) Quantitative Models outside Pillar 1
The intent is to further discuss the use of internal models for regulatory risk assessment and it is expected that further guidance will be provided.

g) Stress tests
No additional changes are required in this area.

h) Data Aggregation
The changes cover the need to actively review information requirements for regulatory submission as well as the need to build ability at the supervisor level for building architecture to capture and analyse this information in a timely fashion.

i) State of the Art Controls including risk management
There has now been a requirement added that supervisors develop an appropriate response commensurate with the nature and degree of the risk associated with systemically important insurers.

6. Group and Consolidated Supervision
The IAIS 2011-2012 roadmap includes a self-assessment exercise on the ICPs related to group supervi-

CONTINUED ON **PAGE 30**

sion with a completion date of spring 2012. The work will be undertaken by the Standards Observance with subject matter expertise provided by the relevant working parties responsible for developing the ICPs.

The roadmap also includes an exercise to develop specific mechanisms that facilitate of solvency information. Work will be undertaken by the Solvency and Actuarial Issues Subcommittee and supported by the Insurance Groups and Cross Sectoral Subcommittee. The development phase will run through to September 2012 with facilitation due for completion by October 2013.

7. Continuous and Comprehensive Supervision
One of the key areas that is sought to be addressed is that there should be continuous communication at senior levels between the supervisor and the supervised entities to continually keep track of developments in the business and industry.

8. Supervisory Colleges, Home/Host
The IAIS 2011-2012 roadmap includes a review and update of the Supervisory College Guidance paper, providing additional guidance for a range of situations involving large, complex institutions which would also be applied to potential SIFIs.

The IAIS has conducted an impact assessment survey of the guidance paper on the use of supervisory colleges supervision. The IAIS is organising regional roundtables with group and host supervisors as well as the relevant insurance groups; preparing a questionnaire on colleges and organising presentations from members with experience in colleges. The information collected will be used to assess the need to review and update the Supervisory College Guidance paper. A report will be completed by end-2012.

The IAIS repository of supervisory colleges (IROSC) is currently being set up under a joint project between the Insurance Groups, Cross Sectoral Subcommittee and the Supervisory Cooperation Subcommittee.

9. Macro-prudential surveillance, Multi-disciplinary approach (forward looking)
Some of the aims of macro prudential surveillance and regulation are to: i) Identify systemic risk (including shocks, interconnectedness and feedback effects), ii) Reduce the likelihood of systemic risk, and iii) Mitigate spill over effects within the financial system and into the real economy. Consistent with this, the focus is now significantly on forward looking analysis and review to facilitate identification of potential problems early and allow interventions that can address such problems.

10. Use of third parties
Supervisors typically call upon third parties for specific assignments to supplement their supervisory work. The ICPs now highlight the need for control and ownership of all such third party use by the supervisor.

11. Concluding Recommendations
The revised ICPs will be assessed based on standards and there will be no additional criteria.

The introduction to the ICPs includes the following statement:
"It is recognised that supervisors need to tailor certain supervisory requirements and actions in accordance with the nature, scale and complexity of individual insurers. In this regard, supervisors should have the flexibility to tailor supervisory requirements and actions so that they are commensurate with the risks posed by individual insurers as well as the potential risks posed by insurers to the insurance sector or the financial system as a whole. This is provided for in the ICPs and standards where relevant."

THE STANDARDS OBSERVANCE

Subcommittee is developing self assessment questionnaires in the areas of supervisory mandate, supervisory powers and group supervision. The Standards Observance Subcommittee's work plan includes the development of self assessment questionnaires for other ICP material over the next two years. A draft IAIS Peer Review Process is currently being prepared for review by the Implementation Committee and others. ■

SOCIETY OF ACTUARIES Financial Reporting Sectio n

The Financial Reporter

NONPROFIT
ORGANIZATION
U.S. POSTAGE
PAID
SAINT JOSEPH, MI
PERMIT NO. 263

475 N. Martingale Road, Suite 600
Schaumburg, Illinois 60173
p: 847.706.3500 f: 847.706.3599 w: www.soa.org